Imagine COMMUNICATIONS™

Reference Manual

NetVX™ Video Networking System

Release 8.6

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Delivering the Moment

imaginecommunications.com

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Return Material Authorization

A Return Material Authorization (RMA) must be obtained prior to returning any equipment. Contact the appropriate call center (listed above) to open a ticket and obtain an RMA.

Release Reference

Table FM-1 NetVX™ Video Networking System Documentation Release History

Release	Date
8.5.1	01-14-2011
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6.5.0	11-03-2005
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Chapter 1: Support, Compliance, and Safety

1

1.1 Technical Phone Support

When calling the Service Center, be prepared with the following information:

- Product Type
- A description of the problem.
- Serial number of the unit or boards affected.
- Your shipping address and telephone number.
- Your Harris order number (if the under warranty).

1.1.1 Service Center Business Hours and Phone Number

The following phone support is provided Monday–Friday 8:00 AM–5:00 PM (Central U.S. Time Zone)

North America: 1 (217) 222-8200 – Follow prompts for Customer Service then 'TV Field Service'.

1.1.2 After-Hours Emergency Service

This service is provided with the Extended Support Package.

North America: 1 (217) 222-8200 – Follow prompts for 'Emergency Parts and Service'.

1.1.3 Return Material Authorization

A Return Material Authorization (RMA) must be obtained prior to returning any equipment. Contact the appropriate call center (listed above) to open a ticket and obtain an RMA.

1.2 Restriction on Hazardous Substances (RoHS) Compliance

Directive 2002/95/EC—commonly known as the European Union (EU) Restriction on Hazardous Substances (RoHS) sets limits on the use of certain substances found in electrical and electronic equipment. The intent of this legislation is to reduce the amount of hazardous chemicals that may leach out of landfill sites or otherwise contaminate the environment during end-of-life recycling. The Directive takes effect on July 1, 2006, and it refers to the following hazardous substances:

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent Chromium (Cr-V1)
- Polybrominated Biphenyls (PBB)
- Polybrominated Diphenyl Ethers (PBDE)

According to this EU Directive, all products sold in the European Union will be fully RoHS-compliant and “lead-free” (See our Web site, www.broadcast.harris.com/leitch, for more information on dates and deadlines for compliance.) Spare parts supplied for the repair and upgrade of equipment sold before July 1, 2006 are exempt from the legislation. Equipment that complies with the EU directive will be marked with a RoHS-compliant emblem, as shown in Figure 1-1.

Figure 1-1 RoHS Compliance Emblem

1.3 Waste from Electrical and Electronic Equipment (WEEE) Compliance

The European Union (EU) Directive 2002/96/EC on Waste from Electrical and Electronic Equipment (WEEE) deals with the collection, treatment, recovery, and recycling of electrical and electronic waste products. The objective of the WEEE Directive is to assign the responsibility for the disposal of associated hazardous waste to either the producers or users of these products. Effective August 13, 2005, producers or users will be required to recycle electrical and electronic equipment at end of its useful life, and may not dispose of the equipment in landfills or by using other unapproved methods. (Some EU member states may have different deadlines.)

In accordance with this EU Directive, companies selling electric or electronic devices in the EU will affix labels indicating that such products must be properly recycled. (See our Web site, www.broadcast.harris.com/leitch, for more information on dates and deadlines for compliance.) Contact your local sales representative for information on returning these products for recycling. Equipment that complies with the EU directive will be marked with a WEEE-compliant emblem, as shown in Figure 1-2.

Figure 1-2 WEEE Compliance Emblem

1.4 Safety

Carefully review all safety precautions to avoid injury and prevent damage to this product or any products connected to it. If this product is rack-mountable, it should be mounted in an appropriate rack using the rack-mounting positions and rear support guides provided. It is recommended that each frame be connected to a separate electrical circuit for protection against circuit overloading. If this product relies on forced air cooling, it is recommended that all obstructions to the air flow be removed prior to mounting the frame in the rack.

If this product has a provision for external earth grounding, it is recommended that the frame be grounded to earth via the protective earth ground on the rear panel. The earthing wire used to connect to the ground stud on the chassis must be a minimum 18 AWG.

Note: Equipment intended for installation in Restricted Access Location.

Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

⚠ WARNING!

IMPORTANT! Only qualified personnel should perform service procedures.

Safety Terms and Symbols in this Manual

⚠ WARNING!

Statements identifying conditions or practices that may result in personal injury or loss of life. High voltage is present.

⚠ CAUTION!

Statements identifying conditions or practices that can result in damage to the equipment or other property.

Chapter 2: NetVX™ System Overview 2

2.1 Overview

The NetVX™ Video Networking System is a modular video networking device. The NetVX™ performs mission-critical, real-time, professional video transport using today's global telecommunication infrastructure. The NetVX™ combines standards-compliant audio, video, and data networking interfaces to integrate with any video plant and expand its reach to broader, even global, data-networks.

Modular Design

The NetVX™ Video Networking System's modular design supports a wide variety of application-specific configurations. NetVX™ chassis house system controller and application modules which may be mixed and matched as desired. Three NetVX™ chassis are available.

- SYS-1700 – Contains slots for two System Controller modules, and fifteen (15) application modules.
- SYS-300 – Contains a built-in System Controller, and slots for three (3) application modules.
- SYS-200 – Contains a built-in System Controller, dual-ASI, and dual SMPTE-310M I/O interfaces (via an internal TMX-M12 module) and slots for two (2) factory-installed application modules.

Standards-Compliant Audio and Video Interfaces

The NetVX™ audio and video interfaces are fully standards-compliant to ensure complete inter-operability with existing data and video plant technology.

- All audio interfaces are industry-standard AES or analog audio.
- Video interfaces are industry-standard SDI, HD-SDI, analog video, ASI and 310M.

Standards-Compliant Video and Audio Compression

NetVX™ Application Modules support popular compression standards.

Video Compression

- MPEG-2
- H.264

Audio Compression

- Dolby™ AC-3™
- Dolby-E™ Passthrough
- MPEG-1 Layer 2
- AAC-LC 2.0
- HE-AAC 2.0 Audio Codecs.

Standards-Compliant Data Networking Interfaces

NetVX™ Networking Modules support SONET (OC-3), PDH (DS3), and IP data networks. Networking Modules support various levels of Forward Error Correction (FEC) and may be 'tuned' to optimally address network-specific conditions.

Extreme Flexibility

Within the NetVX™, 'Cross Connections' link signals between encoders, decoders, multiplexers, demultiplexers, and ATM and IP interfaces. Cross Connections are established dynamically through software control. Each Cross Connection source can simultaneously service up to eight different destinations within the NetVX™. Therefore, a single encoder can operate as a source feeding (1) A decoder, (2) Three different ATM connections, and (3) Four different IP connections. Any of these Cross Connections can be added, dropped, or re-routed in real-time on an as-needed basis without affecting any other Cross Connection. The NetVX™ supports similar routing configurations between any internal source or destination.

Redundancy by Design

Uptime can be paramount when networking video, and real-time failover protection critical. Redundancy protection is designed into the NetVX™ Video Networking System to support your application needs and to meet your application budget. Several types of redundancy are provided for maximum signal protection.

- 1:1 Redundancy – A single backup module supports a single active module. In the event of a failure, the secondary module provides the service of the primary module.
- N:M Redundancy – One or more backup modules support one or more active modules. The relationship between the quantity of active and backup modules is fully configurable. In the event of a failure, a secondary module assumes service of the primary module. Any subsequent failures can direct the service to other remaining backup modules.
- External Path Redundancy – The NetVX™ monitors incoming ATM or IP-based network data. A Loss of Signal or ATM AIS detected on a monitored data interface triggers a failover to the backup module.
- Internal Path Redundancy – The NetVX™ monitors a Cross Connection. A Service Fault detected on the monitored Cross Connection triggers a failover to the backup Cross Connection.

Monitoring and Control

The NetVX™ provides a number of configuration interfaces including Telnet, craft port, SNMP, and an HTTP-based web browser.

Vidiem™ Element Management System

The Vidiem™ Element Management System is a sophisticated Windows-based application used to configure and monitor NetVX™ systems. Features include:

- A drag and drop interface simplifies otherwise more complex configuration operations.
- Vidiem™ provides a high-level of configuration logic and rule checking that is not available in any other NetVX™ configuration interface.
- Vidiem™ uses SNMP for IP-based communications with remote NetVX™ systems.
- Vidiem™ supports real-time NetVX™ status monitoring at a user-defined polling interval.
- The 'Status Monitoring Interface' provides a dynamic graphical representation of the system for at-a-glance system quality assurance.
- A dynamically-updated 'Status Tree' flags errors by sub-system. The 'Status Tree' provides a means to rapidly navigate all status parameters and to quickly locate the exact source of any errors.
- A 'Trap Log' monitoring service maintains a list of all traps received. Trap Log entries serve as hyperlinks to more detailed dynamically-generated HTML-based 'Trap Description Pages'. Each HTML-based Trap Description Page describes alarm-specific error conditions and provides guidance to begin debugging and to quickly identify the root cause of trap-inducing alarms.
- Extensive Help System documents all NetVX™-related procedures, all configuration settings and options, and all status parameters.

Vidiem™ Service Manager

The Vidiem™ Service Manager is a stand-alone Windows server-based application that runs on an instance of Oracle. The Service Manager provides full service scheduling and management of connections between a network of NetVX™ systems. Service Manager uses SNMP to bring up and to tear down connections between remote endpoints. Endpoints can also include routers connected to the NetVX™ and supported by the system's serial port router control functionality.

Vidiem™ Service Manager provides users with web-based interfaces to easily support concurrent multi-user access. Each interface is designed for a particular business function.

- Network administrators use the 'Administrator Interface' for network configuration and administration.
- Sales associates use the 'Web Client Interface' to book and schedule video connections ordered by end-customers.
- Third-parties use the 'XML Automation Interface' for machine control.
- A 'Fixed-Service' interface provides a means to 'nail up' permanent, or semi-permanent connections.
- Web-based Source and Destination 'Scheduling Grids' provide graphical representations of resource allocation.
- A 'Scheduling Grid' indicates upcoming, present, and recently completed reservation activity and status.

The Bottom Line

The NetVX™ Video Networking System, Vidiem™ Element Management System, and Vidiem™ Service Manager line of products provide the infrastructure needed to create, configure, schedule, and monetize real-time global video networks.

Chapter 3: NetVX™ SYS-200 Chassis

Physical Description and Basic Procedures

3

3.1 Overview

The SYS-200 chassis has an embedded system controller and TMX module, and slots for two factory-installed (non-field serviceable) modules. The embedded TMX module's I/Os are brought out through several of the interfaces fixed on the rear of the unit. The NetVX™ SYS-200 chassis is designed to fit in 1 RU of a standard 19” rack. Using rack mount ears and rear supports, the unit mounts in cabinets ranging from 21” to 36” deep. The SYS-200 operates on 110/220V AC power.

A front panel, craft port, telnet, and HTML-based interfaces are provided with the system for basic command configuration and status monitoring. The Vidiem™ Element Management System (sold separately) provides full remote configuration, monitoring, and control capabilities over SNMP.

3.2 SYS-200 Front Panel

Figure 3-1 SYS-200 Chassis – Front View

Table 3-1 SYS-200 Chassis – Front View

#	Item	Description
1	Front Rack Ears	Provides front-mounting support in 19" chassis.
2	Intake Ports	Intake ports for cooling air. Ensure that installation does not block these ports.
3	Front Panel Controls	Controls for system configuration and status monitoring. See 8.1 Front Panel Display and Controls on page 71 for details.
4	Front Panel LEDs	Provides high-level indicators of system status. See 8.1 Front Panel Display and Controls on page 71 for details.

3.3 SYS-200 Chassis Rear Panel

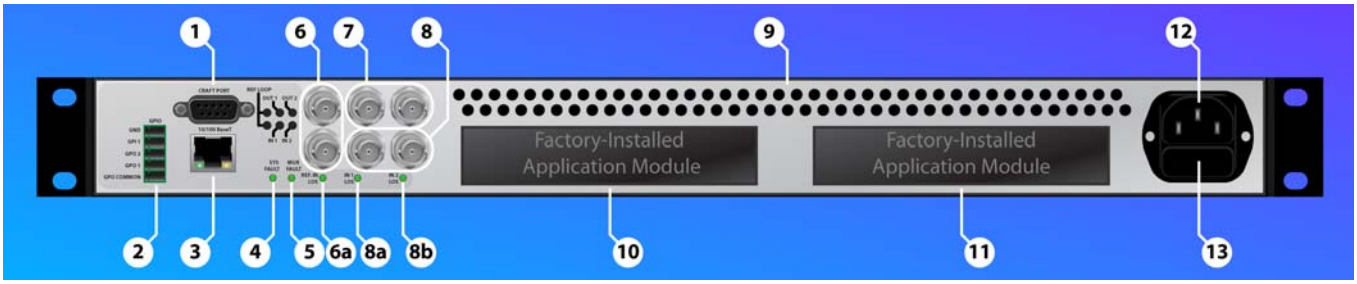


Figure 3-2 SYS-200 Chassis – Rear View

Table 3-2 SYS-200 Chassis – Rear View

#	Item	Description
1	Craft Port Interface Connection	Provides an RS-232 craft port control connection. See 3.5.1 Craft Port Interface on page 34 for details.
2	GPI/GPO Connections	Provides external connections to trigger and activate alarms. See 3.5.2 General Purpose I/O Connections on page 35 for details.
3	RJ-45 Connection	10/100 BaseT Ethernet connection.
4	SYS FAULT Tri-Color Status LED	Indicates the state of the internal SYS-A22 System Controller module. **Off** Module not powered. **Green** Module is active and no faults are detected. **Amber** Module is booting, offline, or running diagnostics. **Red** Module has detected a hardware fault and should be replaced.
5	MUX FAULT Tri-Color Status LED	Indicates board state. **Off** Module not powered. **Green** Module is active and no faults are detected. **Amber** Module is booting, offline, or running diagnostics. **Red** Module has detected a hardware fault and should be replaced.
6	Reference Input and Loop through BNCs	Receives black-burst input.
6a	REF IN LOS Reference Input LED	Indicates the state of the Black Burst Reference Input signal. **Green** Indicates Black Burst signal is present. **Red** Indicates Loss of Black Burst signal.
7	ASI/310M Output Ports	SMPTE 310M or ASI Multi-Program Transport Stream Outputs.
8	ASI/310M Input Ports	SMPTE 310M or ASI Multi-Program Transport Stream Inputs.
8a 8b	IN 1, IN 2 LOS ASI/310M Tri-Color Status LEDs	Indicates state of adjacent ASI/310M input signal. **Off** Interface not configured for use. **Green** Input signal is present and error-free. **Amber** Input signal is present with errors. **Red** Loss of signal or loss of framing.
9	Fan Exhaust Ports	Exhaust ports for cooling air.
10	Application Module – Slot 3	Slots for factory-installed application modules or blank faceplate(s). See the relevant chapter in this manual for details on specific application modules. NOTE: These modules are not field-serviceable and MUST NOT be removed from the chassis. Breaking the seal for either of these modules voids both warranty and technical support contracts for this unit.
11	Application Module – Slot 4	
12	Power Supply Interface	Provides power to the unit.
13	Power Interface AC Fuse Housing	Housing for the fuse protecting the system from power input surges.

3.4 SYS-200 Chassis Types and Features

Each NetVX™ SYS-200 chassis is factory-configured as a particular Chassis Type as shown in Table 3-3 below.

Table 3-3 NetVX™ SYS-200 Chassis Type Definitions

Features	SYS-200 Chassis Types	
	SYS-200-STD	SYS-200-MUX
Internal TMX-M12-TNL2 Module		
Internal TMX-M12-MUX Module		
IP on ATM (Optional keyed feature)	SYS-200-STD-IA	SYS-200-STD-IA
Video on IP (Optional keyed feature)	SYS-200-STD-VIP	SYS-200-STD-VIP

Legend	
Supported Feature	
Unsupported Feature	

* Video on IP (VIP) in this table addresses video going through the System Controller. This approach is not a recommended practice, but is available with keys that enable it.

3.5 Electrical Connections

3.5.1 Craft Port Interface

The craft port interface provides RS-232 terminal access for system control and diagnostics. This interface provides a convenient means to set the system's IP address. Once the system's Ethernet IP address is set, you can use the Vidiem™ Element Management System to set most other parameters. The interface is a female DB-9.

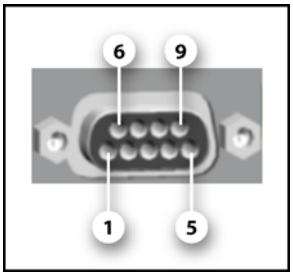


Figure 3-3 SYS-200 Craft Port Interface (Female DB-9)

Table 3-4 Craft Port Interface Pinout

Item	Pin	RS-232 Signal	Description
1	1	N.C.	No connection
	2	TXD	Serial Data Transmit Positive
	3	RXD	Serial Data Receive Positive
	4	DSR*	Data Set Ready
5	5	GND	Signal Ground
6	6	DTR*	Data Terminal Ready
	7	CTS*	Clear to Send
	8	RTS*	Request to Send
9	9	N.C.	No Connection

Use these settings when configuring a terminal connection for use with the craft port interface.

- Bits per second: 9600
- Data Bits: 8
- Parity: None
- Stop Bits: 1
- Flow Control: None

3.5.2 General Purpose I/O Connections

The SYS-200 provides one General Purpose Input (GPI) and two General Purpose Outputs (GPOs). GPI/GPO status may be monitored locally through the system's craft port and telnet interfaces, or remotely via SNMP using the Vidiem™ Element Management System.

GPI Each GPI pair is composed of a 5 volt source and a ground. The GPI is triggered when the system senses at minimum of 5 milliamps of current.

GPO GPOs provide external triggers to notify of certain system operations. GPOs are normally open when the NetVX™ is receiving power. Through software configuration, each GPO can be linked to either an alarm event of a specific severity or to a backup protection module becoming active. Each GPO circuit can carry up to ±75 volts with a 300 Ohm load. All GPOs circuits are closed when the NetVX™ is not powered.

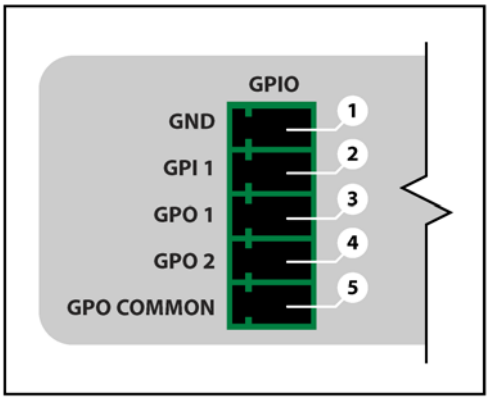


Figure 3-4 SYS-200 GPI GPO Interface

Table 3-5 GPI/GPO Pinouts

Item	Name	Signal	Function
1	GND	Ground	—
2	GPI 1	+5 volts	Input triggered by closing circuit between contacts. Status indicates 'Closed' when at least 5 milliamps of current flowing to Ground is detected.
3	GPO 1	±75 volts	Power OFF Circuit closed Power ON Circuit normally open, relay-controlled contact closures linked by software to alarm/ fault conditions.
4	GPO 2		
5	GPO Common	—	—

3.5.3 10/100 BaseT Ethernet Connection

Use this interface to connect the SYS-200 to a LAN for system control, status monitoring, and firmware upgrades. A Category 5 cable of up to 100 meters in length may be used to link the NetVX™ to a hub. The (+) and (-) polarities must be wired correctly for proper operation.

Table 3-6 10/100 BaseT Ethernet Pin Assignments

Item	Pin	Signal	Description
1	—	10 Mbps (LED)	Amber Indicates 10 BaseT. OFF Indicates 100 BaseT.
2	—	LINK/ACT (LED)	Green (Solid) Indicates link. Green (Blinking) Indicates 10/100 BaseT activity. OFF Indicates no link.
3	1	TX+	Transmit +
—	2	TX-	Transmit -
—	3	RX+	Receive +
—	4	Chassis GND	No connection
—	5	Chassis GND	No connection
—	6	RX-	Receive -
—	7	Chassis GND	No connection
4	8	Chassis GND	No connection

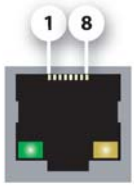


Figure 3-5 SYS-200 10/100 BaseT Ethernet Interface (RJ-45)

3.6 NetVX™ SYS-200 Chassis Parts List

Table 3-7 lists enclosure-related part numbers and descriptions.

Table 3-7 SYS-200 Chassis Parts List

Part	Description
SYS-200-STD	NetVX™ chassis with two factory-configured (non-user serviceable) application module slots, AC power, and an internal TMX-M12-TNL2 module.
SYS-200-MUX	NetVX™ chassis with two factory-configured (non-user serviceable) application module slots, AC power, and an internal TMX-M12-MUX module.
SYS-VIP-KEY	Software key enabling Video on IP features on the system controller.
SYS-IPOA-KEY	Software key enabling IP Over ATM (IPOA) features.

3.7 SYS-200 Chassis Specifications

General Specifications

Ambient Temperature

Operating	0°C to 40°C	(32°F to 104°F)
Non-Operating	–40°C to 65°C	(-40°F to 149°F)

Humidity

5%-95% Non-condensing

Internal Design

Application Modules	100 mm x 160 mm

Safety Compliance

SYS-200-AC	UL & cUL (United States-UL1950 and Canada-CSA C22.2, No.950)
SYS-200-AC	CE

FCC Certification

SYS-200-AC	Complies with FCC Subpart 15, Class A

Bandwidth

See Chapter 26: NetVX™ Bandwidth on page 455 for details.

Physical Specifications

Height	1 RU	4.4 cm (1.73 inches)
Width	43.18 cm	17 inches, standard 19-inch rack mount
Depth	48.3 cm	19.02 inches, not including cable allowances
Weight (unpopulated)	3.63 kg	8.0 lbs

Electrical Specifications

SYS-200

Minimum Power Consumption (Chassis without application modules)	45 W *
Maximum Power	100 W
Supply Voltage	100–240 V AC
Current	2 Amps (max).
Supply Frequency	47–63 Hz
Power Plug	IEC-C-13
Protection	3.15 A @ 250V GMC time delay fuse

* To estimate the overall power consumption of a populated SYS-200 AC system, sum the ‘Minimum Power Consumption’ figure listed on this page along with the ‘Power Consumption’ value for each module in the SYS-200 chassis. The 'Power Consumption' value is provided on the specifications page for each module in this document.

Chapter 4: NetVX™ SYS-350 Chassis

Physical Description and Basic Procedures

4

4.1 Overview

The NetVX™ SYS-350 chassis provides much of the system functionality and behavior of the larger SYS-1700, but in a 1RU form factor. The SYS-350 supports three removable application modules and houses a built-in system controller. A front panel, craft port, telnet, and HTML-based interfaces are provided with the system for basic command configuration and status monitoring. The Vidiem™ Element Management System (sold separately) provides full remote configuration, monitoring, and control capabilities over SNMP.

Using rack mount ears, the NetVX™ SYS-350 chassis fits in 1 RU of a standard 19” rack and mounts in cabinets ranging from 21” to 36” deep. Each model of the SYS-350 has an option for either AC or DC power. AC models operate on 110/220V AC power. DC models operate on 36–60 V DC.

4.2 NetVX™ SYS-350 AC Chassis

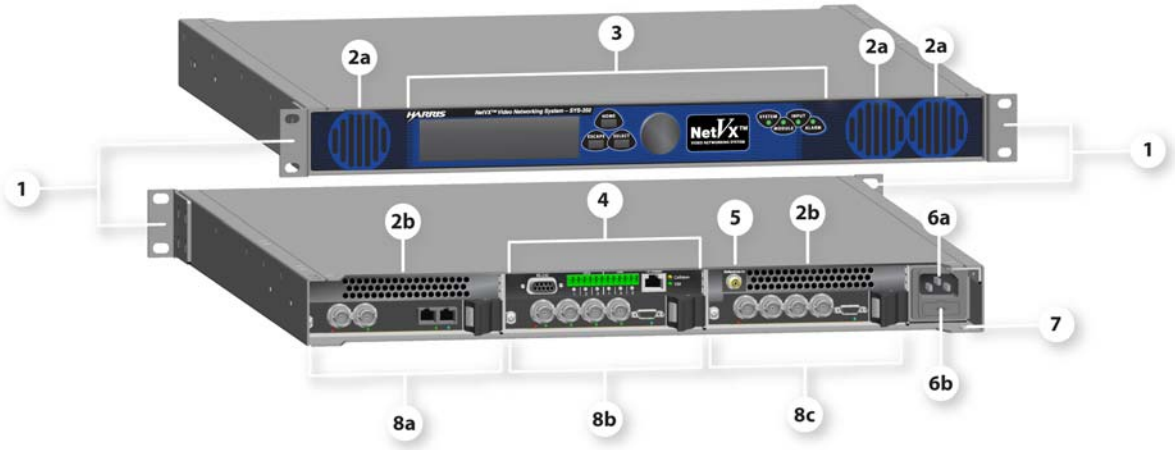


Figure 4-1 SYS-350 AC Chassis – Front and Rear Views

Table 4-1 SYS-350 AC Chassis – Front and Rear Views

#	Item	Description
1	Front Rack Ears	Provides front-mounting support in 19" chassis.
2a	Front Fan Air Intake Ports	Intake ports for cooling air. Warning: Do not block airflow.
2b	Rear Fan Air Exhaust Ports	Exhaust ports for cooling air. Warning: Do not block airflow.
3	Front Panel Control Interface	Provides controls for system configuration and status monitoring. See Chapter 8: NetVX™ Front Panel Control Interface on page 71 for details.
4	Rear Connector Panel	Provides configuration and status monitoring interfaces. See 4.6 NetVX™ SYS-350 Rear Connector Panel on page 41 for details.
5	Reference Input Interface	Receives black-burst input. See 4.7.4 Reference Input on page 44 for details.
6a	Power Supply Interface	Provides power to the unit (AC Interface shown).

Table 4-1 SYS-350 AC Chassis – Front and Rear Views

6b	Power Interface AC Fuse Housing	Housing for the fuse protecting the system from power input surges.
7	Grounding Holes	Provides a 6/32 thread hole for chassis grounding.
8a–c	Application Module Slots 2–4	Application module slots.

4.3 NetVX™ SYS-350 DC Chassis

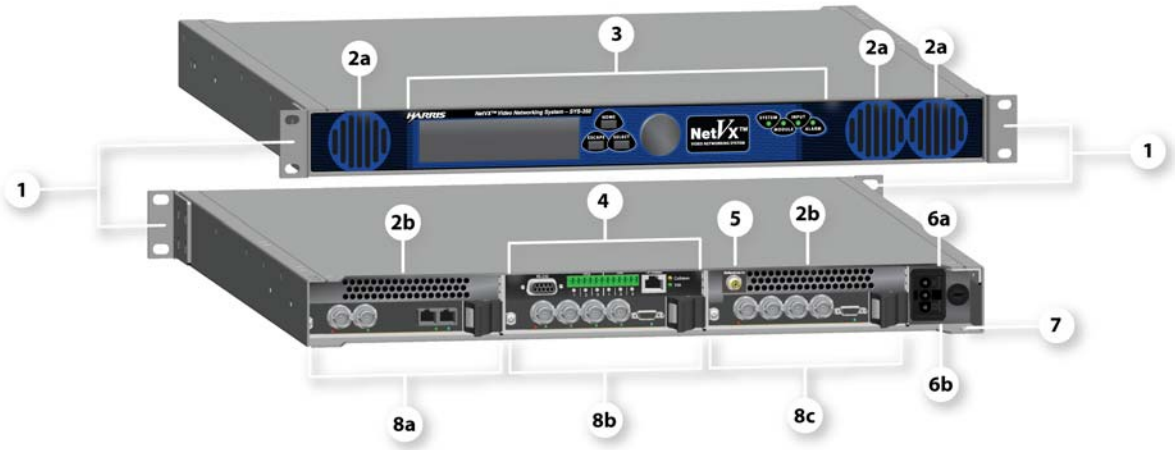


Figure 4-2 SYS-350 DC Chassis – Front and Rear Views

Table 4-2 SYS-350 DC Chassis – Front and Rear Views

#	Item	Description
1	Front Rack Ears	Provides front-mounting support in 19" chassis.
2a	Front Fan Air Intake Ports	Intake ports for cooling air. Warning: Do not block airflow.
2b	Rear Fan Air Exhaust Ports	Exhaust ports for cooling air. Warning: Do not block airflow.
3	Front Panel Control Interface	Provides controls for system configuration and status monitoring. See Chapter 8: NetVX™ Front Panel Control Interface on page 71 for details.
4	Rear Connector Panel	Provides configuration and status monitoring interfaces. See 4.6 NetVX™ SYS-350 Rear Connector Panel on page 41 for details.
5	Reference Input Interface	Receives black-burst input. See 4.7.4 Reference Input on page 44 for details.
6a	Power Supply Interface	Provides power to the unit (DC Interface shown).
6b	Fuse Housing	Housing for the DC fuse protecting the system from power input surges.
7	Grounding Holes	Provides a 6/32 thread hole for chassis grounding.
8a–c	Application Module Slots 2–4	Application module slots.

4.4 NetVX™ SYS-350 Chassis Types and Features

Each NetVX™ SYS-350 chassis is factory-configured as a particular Chassis Type. Chassis Types are composed of a Chassis Base Type, such as “SYS-350”, and a suffix, such as “IA-VI”. The Chassis Type indicates which premium features are available to modules in this chassis. Table 4-3 below identifies each Chassis Type.

Table 4-3 NetVX™ SYS-350 Chassis Type Definitions

Features	SYS-350 Chassis Types						
	SYS-350-AC	SYS-350-AC-STD	SYS-350-AC-IA	SYS-350-AC-IA-VI	SYS-350-AC-VI	SYS-350-AC-MHE	SYS-350-AC-MHES
IP on ATM							
Video on IP*							
MH Encapsulation							
MH Encapsulation and Signalling							

Legend	
Supported Feature	
Unsupported Feature	

* Video on IP (VIP) in this table addresses video going through the System Controller. This approach is not a recommended practice, but is available with keys that enable it.

4.5 NetVX™ SYS-350 Chassis Rack Installation

Secure front rack mount ears to the equipment cabinet using rack mount screws (not included) designed for use with your cabinet.

4.6 NetVX™ SYS-350 Rear Connector Panel

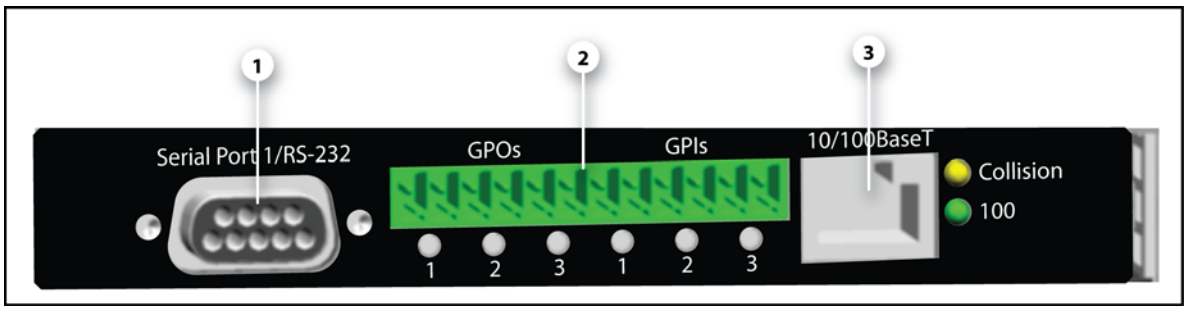


Figure 4-3 SYS-350 Rear Connector Panel

Table 4-4 SYS-350 Rear Connector Panel

#	Item	Description
1	Craft Port Interface	Provides the system’s RS-232 control interface. See 4.7.1 Craft Port Interface on page 42 for details.
2	GPO/GPI Connections and LEDs	Provides external connections to trigger and activate alarms. See 4.7.2 General Purpose I/O Connections on page 42 for details.
3	RJ-45 Connection and LEDs	10/100 BaseT Ethernet Port. See 4.7.3 10/100 BaseT Ethernet Connection on page 44 for details.

4.7 Electrical Connections

4.7.1 Craft Port Interface

The craft port interface provides RS-232 terminal access for system control and diagnostics. This interface provides a convenient means to set the system's IP address. Once the system's Ethernet IP address is set, you can use the Vidiem™ Element Management System to set most other parameters. The interface is a female DB-9.

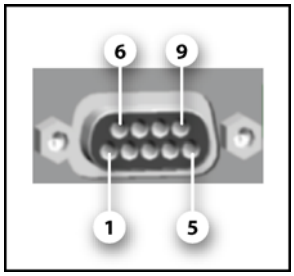


Table 4-5 Craft Port Interface Pinout

Item	Pin	RS-232 Signal	Description
1	1	N.C.	No connection
	2	TXD	Serial Data Transmit Positive
	3	RXD	Serial Data Receive Positive
	4	DSR*	Data Set Ready
5	5	GND	Signal Ground
6	6	DTR*	Data Terminal Ready
	7	CTS*	Clear to Send
	8	RTS*	Request to Send
9	9	N.C.	No Connection

Figure 4-4 SYS-350 Craft Port Interface (Female DB-9)

Use these settings when configuring a terminal connection for use with the craft port interface.

- Bits per second: 9600
- Data Bits: 8
- Parity: None
- Stop Bits: 1
- Flow Control: None

4.7.2 General Purpose I/O Connections

The SYS-350 provides three General Purpose Outputs (GP0s) and three General Purpose Inputs (GPIs). GPI/GPO status may be monitored locally through the system craft port and telnet interfaces, or remotely via SNMP using the Vidiem™ Element Management System.

GPO

GPOs provide external triggers to notify of certain system operations. GPOs are normally open when the NetVX™ is receiving power. Through software configuration, each GPO can be linked to either an alarm event of a specific severity or to a backup protection module becoming active. Each GPO circuit can carry up to ±75 volts with a 300 Ohm load. The corresponding LED below each GPO pair illuminates whenever the system is powered and the GPO circuit is closed. All GPOs circuits are closed when the NetVX™ is not powered.

GPI

Each GPI pair is composed of a 5 volt source and a ground. The GPI is triggered when the system senses at minimum of 5 milliamperes of current. The corresponding LED below each GPI pair illuminates whenever the NetVX™ is powered and the GPI is triggered.

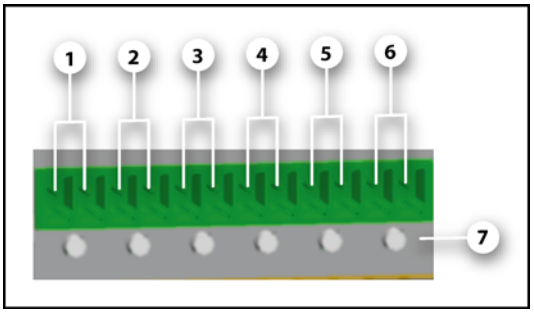


Figure 4-5 SYS-350 GPI GPO Interface

Table 4-6 GPI/GPO Pinouts

Item	Name	Pin	Signal	Function
1	GPO 1	1 (left-most pin)	—	Power OFF Circuit closed Power ON Circuit normally open, relay-controlled contact closures linked by software to alarm/fault conditions.
		2	—	
2	GPO 2	3	—	
		4	—	
3	GPO 3	5	—	
		6	—	
4	GPI 1	7	Ground	Input triggered by closing circuit between contacts. Status indicates 'Closed' when at least 5 milliamps of current flowing to Ground is detected.
		8	+5 volts	
5	GPI 2	9	Ground	
		10	+5 volts	
6	GPI 3	11	Ground	
		12	+5 volts	
7	LEDs	—	—	Indicate when the GPO/GPI pair above is triggered.

4.7.3 10/100 BaseT Ethernet Connection

Use this interface to connect the SYS-350 to a LAN for system control, status monitoring, and firmware upgrades. A Category 5 cable of up to 100 meters in length may be used to link the NetVX™ to a hub. The (+) and (-) polarities must be wired correctly for proper operation.

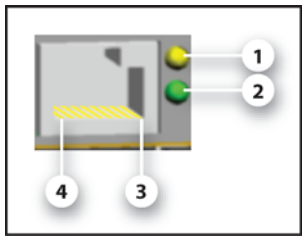


Table 4-7 10/100 BaseT Ethernet Pin Assignments

Item	Pin	Signal	Description
1	—	10 Mbps (LED)	Amber Indicates 10 BaseT. OFF Indicates 100 BaseT.
2	—	LINK/ACT (LED)	Green (Solid) Indicates link. Green (Blinking) Indicates 10/100 BaseT activity. OFF Indicates no link.
3	1	TX+	Transmit +
—	2	TX-	Transmit -
—	3	RX+	Receive +
—	4	Chassis GND	No connection
—	5	Chassis GND	No connection
—	6	RX-	Receive -
—	7	Chassis GND	No connection
4	8	Chassis GND	No connection

Figure 4-6 SYS-350 10/100 BaseT Ethernet Interface (RJ-45)

4.7.4 Reference Input

Figure 4-7 SYS-350 Reference Input and Cable

The SYS-350's reference video input (labeled 'Reference In') accepts a 300mv black burst input on a male SMB interface internally terminated with a 75-Ohm load. When a black-burst signal is received through this interface, any of the system's video and audio outputs can be configured to lock to this reference. A Reference Input Cable is provided with each SYS-350 to adapt the male SMB interface to a standard BNC connection.

Attach the cable to the SYS-350 by pushing the smaller, SMB-end (pictured on the left side in the cable image above) onto the 'Reference In' interface. The cable locks securely onto the interface when installed properly. Simply pull the outer sleeve to release and remove the cable.

4.7.5 DC Power Interface

The SYS-350 DC interface accepts a 36–60V DC supply voltage.

Figure 4-8 SYS-350 DC Power Interface

⚠ WARNING!

* The unit is for use only in a Restricted Assess Location.
* The unit is provided with a Protective Earthing Connection. The ground terminal must be connected to protective earth.
* The DC connector should not be connected or disconnected under load.
* The DC connector provided contains three 18 gauge wires, black (-), red (+), and green/yellow (ground).
* The wiring should be protected from physical damage by use of protective tubing and strain relieving as necessary.

4.8 NetVX™ SYS-350 Chassis Parts List

Table 4-8 lists enclosure-related part numbers and descriptions. See Section 4.4, "NetVX™ SYS-350 Chassis Types and Features" on page 41 for details of the features provided by each key.

Table 4-8 SYS-350 Chassis Parts List

Part	Description
SYS-350-AC	See Table 4-3 NetVX™ SYS-350 Chassis Type Definitions on page 41 for details.
SYS-350-AC-STD	See Table 4-3 NetVX™ SYS-350 Chassis Type Definitions on page 41 for details.
SYS-350-AC-IA	See Table 4-3 NetVX™ SYS-350 Chassis Type Definitions on page 41 for details.
SYS-350-AC-IA-VI	See Table 4-3 NetVX™ SYS-350 Chassis Type Definitions on page 41 for details.
SYS-350-AC-VI	See Table 4-3 NetVX™ SYS-350 Chassis Type Definitions on page 41 for details.
SYS-350-AC-MHE	See Table 4-3 NetVX™ SYS-350 Chassis Type Definitions on page 41 for details.
SYS-350-AC-MHES	See Table 4-3 NetVX™ SYS-350 Chassis Type Definitions on page 41 for details.
PWR-CRD-120	120V AC Power Cord (NEMA 5-15P/IEC320 C-13).
PWR-CRD-220	220V AC Power Cord with wire ends.
	Reference Input Cable. Adapts SMB to BNC

4.9 NetVX™ SYS-350 Chassis Specifications

General Specifications

Ambient Temperature

Operating	0°C to 40°C	(32°F to 104°F)
Non-Operating	–40°C to 65°C	(-40°F to 149°F)

Humidity

Non-Condensing	5%-95%

Internal Design

Application Modules	100 mm x 160 mm

Safety Compliance

SYS-350-AC, SYS-350-DC (SYS-350-DC is pending approval)	UL & cUL (United States-UL1950 and Canada-CSA C22.2, No. 950)
SYS-350-AC, SYS-350-DC	CE

FCC Certification

SYS-350-AC, SYS-350-DC	Complies with FCC Subpart 15, Class A

Bandwidth

See Chapter 26: NetVX™ Bandwidth on page 455 for details.

Physical Specifications

Height	1 RU	4.4 cm (1.73 inches)
Width	44.2 cm	17.50 inches, standard 19-inch rack mount
Depth	49.2125 cm	19.375 inches, not including cable allowances
Weight (unpopulated)	4.45 kg	9.8 lbs

Electrical Specifications

SYS-350-AC

Maximum Power	212 W
Supply Voltage	90–264V AC
Current	2.5A (max).
Supply Frequency	47–63 Hz
Power Plug	IEC-C-13
Protection	3.15A @250V GMC Time-Delay Fuse

SYS-350-DC

Maximum Power	180 W
Supply Voltage	36–60 V DC
Current	6A (max).
Power Plug	Corcom DA Series/Molex GA310
Protection	6A @ 250V GMC Time Delay Fuse

* To estimate the overall power consumption of a populated SYS-350 AC system, sum the ‘Minimum Power Consumption’ figure listed on this page along with the ‘Power Consumption’ value for each module in the SYS-350 chassis. The 'Power Consumption' value is provided on the specifications page for each module in this document.

Chapter 5: NetVX™ SYS-1700 Chassis

Physical Description and Basic Procedures

5

5.1 Overview

The NetVX™ SYS-1700 chassis is designed to fit in 5 RU of a standard 19” rack and may be mounted with either front (standard) or middle rack-mount ears[1].The SYS-1700 chassis houses one system controller and up to 16 application modules. Systems are factory configured for either 110/220 VAC or 48 DC power. A single power supply is provided with each unit, however additional space is provided for a backup power supply.

A front panel, craft port, telnet, and HTML-based interfaces are provided with the system for basic command configuration and status monitoring. The Vidiem™ Element Management System (sold separately) provides full remote configuration, monitoring, and control capabilities over SNMP.

The system contains two internal cooling fans. Both fans are user-serviceable and may be swapped while the system is in service. A user-serviceable air filter protects the system from dust. The filter is mounted across the interior of the air intake area at the front of the system.

1. The rack-mount ears may be removed, turned, and re-installed to accommodate a 23 inch rack as well.

5.2 NetVX™ SYS-1700 Chassis

The front of the NetVX™ enclosure provides access to the system's front panel controller and air filter housing.

Figure 5-1 SYS-1700 Chassis – Front View

Table 5-1 SYS-1700 Chassis – Front

#	Item	Description
1	Front Panel Control Interface	Provides controls for system configuration and status monitoring. Chapter 8: NetVX™ Front Panel Control Interface on page 71 for details about this interface.
2	Air Intake	Cooling air intake – DO NOT BLOCK!
3	Rack Ears (front location)	Provides front-mounting in 19" chassis.
4	Thumbscrews with Posidriv Captive Fasteners	Provide access to the front facade's air filter.

5.3 NetVX™ SYS-1700 Enclosure Rear

The rear of the NetVX™ enclosure provides access to the system's application and control modules, its hot-swap fan units and power supplies, and its various interface connections.

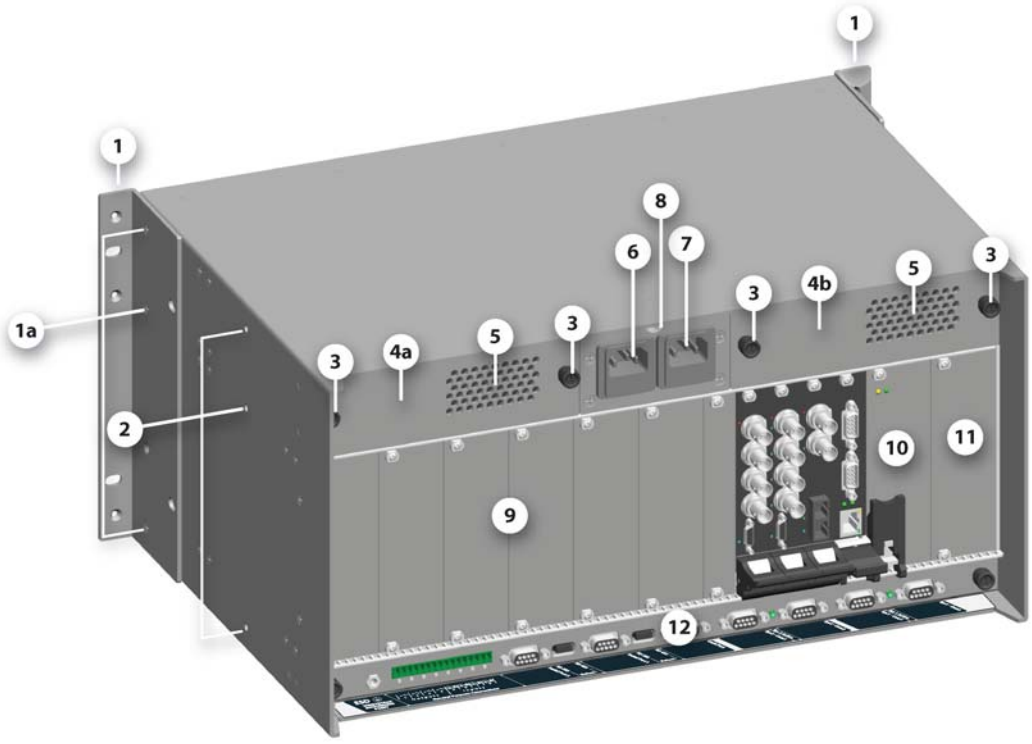


Figure 5-2 SYS-1700 Chassis – Rear View

Table 5-2 SYS-1700 Chassis – Rear

#	Item	Description
1	Front Mount Rack Ears	Provides front-mounting supports in 19" chassis (location shown is "as shipped")
1a	Front Mount Rack Ear Screws	Screw locations for front mounting rack ears.
2	Center Mount Rack Ear Screw Holes	Screw locations for center mounting rack ears.
3	Thumbscrews with Posidriv Captive Fasteners	Secure fan units in place.
4a	Fan 2	Provide system cooling. These units may be replace while the system is in-service.
4b	Fan 1	
5	Fan Exhaust Port	Exhausts cooling air. DO NOT BLOCK IN INSTALLATION!
6	Primary Power Supply Interface (SYS-1700-AC shown)	Provides power to the primary power supply module.
7	Secondary Power Supply Interface (SYS-1700-AC shown)	Provides power to the secondary power supply module.
8	Grounding Terminal	Use this terminal to ground the system chassis.
9	Blank Filler Panels	Protects module rails and backplane, and ensures proper air flow.

Table 5-2 SYS-1700 Chassis – Rear

10	Primary Power Supply Module	Converts line voltage to levels suitable for use by the system.
11	Secondary Power Supply Module	Provides backup for the primary power supply.
12	Connector Panel Assembly	Provides connection interfaces for RS-232/RS-422, and GPIO alarms. 5.6 NetVX™ SYS-1700 Enclosure Rear: Connector Board Assembly on page 55 on the next page for details.

5.4 NetVX™ SYS-1700 Chassis Types and Features

Each NetVX™ SYS-1700 chassis is factory-configured as a particular Chassis Type. Chassis Types are composed of a Chassis Base Type, such as “SYS-1700”, and a suffix, such as “IA-VI”. The Chassis Type indicates which premium features are available to modules in this chassis. Table 5-3 below identifies each Chassis Type.

Table 5-3 SYS-1700 Chassis Types and Features

Features	SYS-1700 Chassis Types						
	SYS-1700-AC, SYS-1700-DC	SYS-1700-AC-STD, SYS-1700-DC-STD	SYS-1700-AC-IA, SYS-1700-DC-IA	SYS-1700-AC-IA-VI, SYS-1700-DC-IA-VI	SYS-1700-AC-VI, SYS-1700-DC-VI	SYS-1700-AC-MHE, SYS-1700-DC-MHE	SYS-1700-AC-MHES, SYS-1700-DC-MHES
IP on ATM							
Video on IP							
MH Encapsulation							
MH Encapsulation and Signalling							

Legend	
Supported Feature	
Unsupported Feature	

* Video on IP (VIP) in this table addresses video going through the System Controller. This approach is not a recommended practice, but is available with keys that enable it.

5.5 NetVX™ Power Assemblies

5.5.1 NetVX™ Model SYS-1700-AC Power Assembly

The NetVX™ model SYS-1700-AC has two independent 120 VAC power interfaces. One interface feeds the primary power supply, the other interface feeds an optional secondary (backup) power supply. Each interface is fused with a 250 volt, 3 amp, time delay fuse.

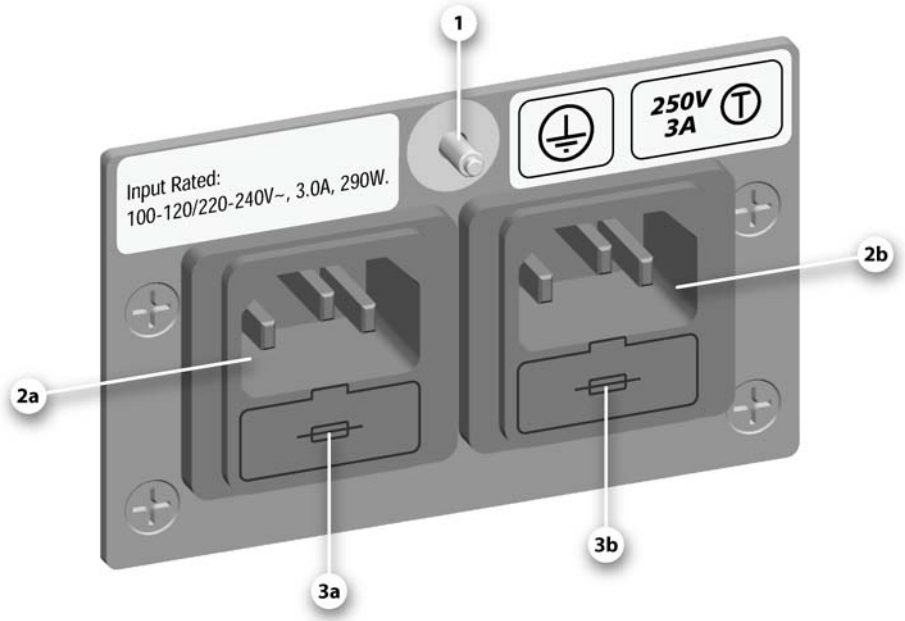


Figure 5-3 SYS-1700 AC Power Interface

Table 5-4 SYS-1700 AC Power Interface

#	Item	Description
1	Chassis Grounding Lug	Grounds the NetVX™ chassis.
2 a	Primary Power Interface	Power interface connection feeding the primary power supply module.
2b	Secondary Power Interface	Power interface connection feeding the secondary power supply module.
3 a	Primary Power Interface AC Fuse Housing	Housing for the fuse protecting the system from surges on the primary power input.
2b	Secondary Power Interface AC Fuse Housing	Housing for the fuse protecting the system from surges on the secondary power input.

5.5.2 NetVX™ Model SYS-1700-DC Power Assembly

The NetVX™ model SYS-1700-DC has two independent 48 VDC power interfaces. One interface feeds the primary power supply, the other interface feeds an optional secondary (backup) power supply. Each interface is fused with a 250 volt, 6 amp, time delay fuse.

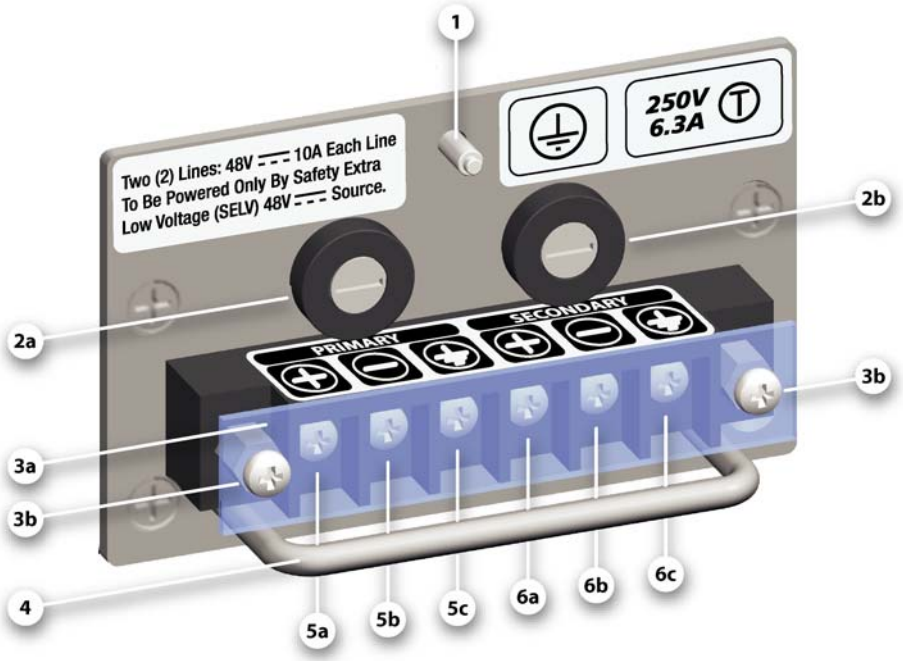


Figure 5-4 SYS-1700 DC Power Interface

Table 5-5 SYS-1700 DC Power Interface

#	Item	Description
1	Chassis Grounding Lug	Grounds the NetVX™ chassis.
2 a	Primary Power Interface DC Fuse Housing	Housing for the fuse protecting the system from surges on the primary power input.
2b	Secondary Power Interface DC Fuse Housing	Housing for the fuse protecting the system from surges on the secondary power input.
3 a	Barrier Strip Cover	Prevents undesired contact with power terminals.
3b	Barrier Strip Cover Mounting Screws	Holds the barrier strip cover in place.
4	Strain Relief Bar	Provides support for wire ties connected to power wiring to reduce strain.
5 a	Primary DC Positive Terminal	Power interface connections feeding the primary power supply module.
5b	Primary DC Negative Terminal	
5c	Primary DC Ground Terminal	
6 a	Secondary DC Positive Terminal	Power interface connections feeding the secondary power supply module.
6b	Secondary DC Negative Terminal	
6c	Secondary DC Ground Terminal	

5.6 NetVX™ SYS-1700 Enclosure Rear: Connector Board Assembly

The connector board provides control and data interfaces for system configuration and connections to external equipment.

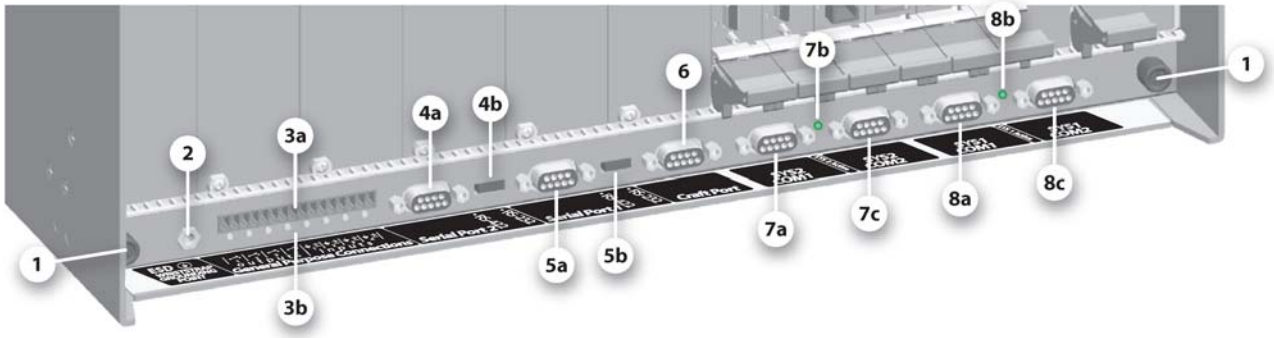


Figure 5-5 SYS-1700 Connector Board

Table 5-6 SYS-1700 Connector Board

#	Item	Description
1	Posidriv Captive Fasteners	Secure the connector board in the chassis.
2	Grounding Connector	ESD grounding wrist strap connection point.
3 a	GPI/GPO Connections	Provides external connections to trigger and activate alarms. See 5.7.3 General Purpose I/O Connections on page 58 for details.
3b	GPI/GPO LEDs	Indicate the state of the I/O connection pair immediately above each of these LEDs.
4 a	Serial Port 2	Provides RS-232 or RS-422 I/O for the active system controller's COM2 serial port. See 5.7.2 Serial Port Interfaces on page 57 for details.
4b	Serial Port 2 – Mode Selection Switch	Selects RS-232 or RS-422 operation mode for Serial Port 2.
5 a	Serial Port 1	Provides RS-232 or RS-422 I/O for the active system controller's COM1 serial port. See 5.7.2 Serial Port Interfaces on page 57 for details.
5b	Serial Port 1 – Mode Selection Switch	Selects RS-232 or RS-422 operation mode for Serial Port 1.
6	Craft Port Interface	Provides an RS-232 craft port control connection. See 5.7.1 Craft Port Interface on page 56 for details.
7 a	System Controller 2 – COM 1	Interface for the secondary system controller's COM1 port to connect to the NetVX™.
7b	"Sys 2 Active" LED	Illuminates when the secondary system controller is currently the active system controller.
7c	System Controller 2 – COM 2	Interface for the secondary system controller's COM2 port to connect to the NetVX™.
8 a	System Controller 1 – COM 1	Interface for the primary system controller's COM1 port to connect to the NetVX™.
8b	"Sys 1 Active" LED	Illuminates when the primary system controller is currently the active system controller.
8c	System Controller 1 – COM 2	Interface for the primary system controller's COM2 port to connect to the NetVX™.

5.7 Electrical Connections

5.7.1 Craft Port Interface

The craft port interface provides RS-232 terminal access for system control and diagnostics. This interface provides a convenient means to set the system's IP address. Once the system's Ethernet IP address is set, you can use the Vidiem™ Element Management System to set most other parameters. The interface is a female DB-9.

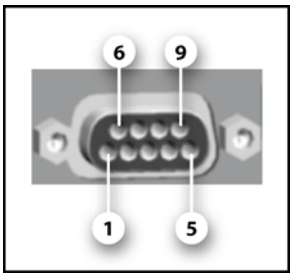


Figure 5-6 SYS-1700 Craft Port Interface (Female DB-9)

Table 5-7 RS-232 Craft Port Pin Assignments

Item	Pin	RS-232 Signal	Description
1	1	N.C.	No connection
	2	TXD	Serial Data Transmit Positive
	3	RXD	Serial Data Receive Positive
	4	DSR*	Data Set Ready
5	5	GND	Signal Ground
6	6	DTR*	Data Terminal Ready
	7	CTS*	Clear to Send
	8	RTS*	Request to Send
9	9	N.C.	No Connection

Use these settings when configuring a terminal connection for use with the craft port interface.

- Bits per second: 9600
- Data Bits: 8
- Parity: None
- Stop Bits: 1
- Flow Control: None

5.7.2 Serial Port Interfaces

The NetVX™ system include two miscellaneous serial ports for interconnections to external equipment such as routers, or automation systems.

These serial ports require the system controller's COM 1 and COM 2 ports to be connected to the chassis's "Sys 1, COM 1" and "Sys 1, COM 2"connectors as shown below.

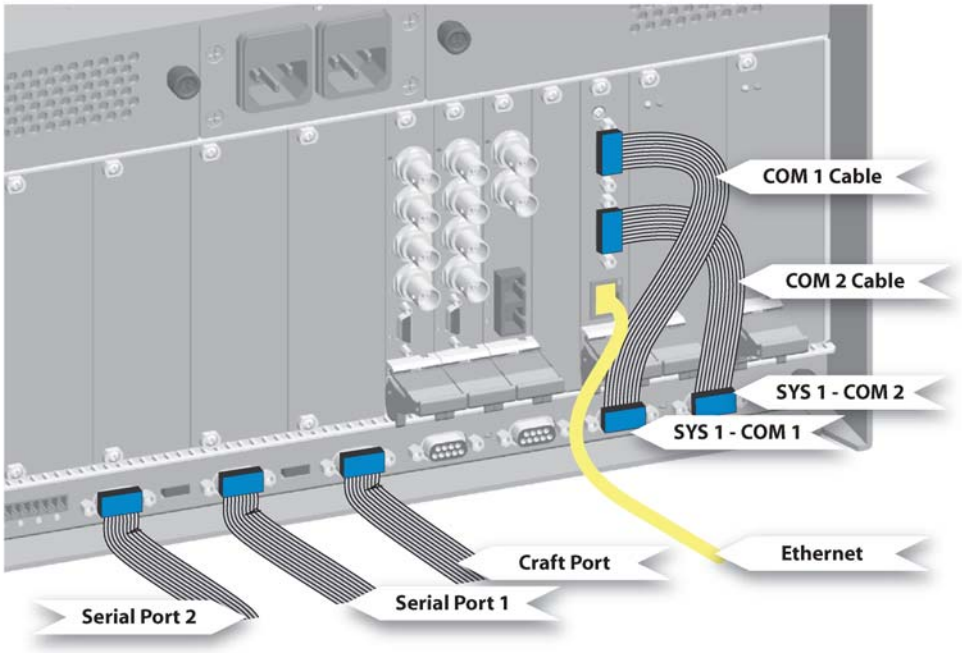


Figure 5-7 SYS-1700 Serial Port and Control Wiring

The mode selection switch, to the right of each serial port, governs the port's mode of operation (either RS-232, or RS-422).

Table 5-8 Serial Port Interface Pinout

Pin	RS-422 Signal	RS-232 Signal	Description
1	TXC +	N.C.	Transmit Clock Positive / No connection
2	TXD +	TXD	Serial Data Transmit Positive
3	RXD +	RXD	Serial Data Receive Positive
4	RXC +	DSR*	Receive Clock Positive / Data Set Ready
5	GND	GND	Signal Ground
6	TXC -	DTR*	Transmit Clock Negative / Data Terminal Ready
7	TXDN -	CTS*	Serial Data Transmit Negative / Clear to Send
8	RXDN -	RTS*	Serial Data Receive Negative / Request to Send
9	RXCN -	N.C.	Receive Clock Negative / No Connection

5.7.3 General Purpose I/O Connections

The NetVX™ provides four General Purpose Outputs (GPOs) and four General Purpose Inputs (GPIs). The GPI/GPO status may be monitored locally through the craft port, and telnet interfaces or remotely via SNMP (using the Vidiem™ Element Management System).

GPO Each GPO provide external triggers to notify of certain system operations. GPOs are normally open when the NetVX™ is receiving power. Through software configuration, each GPO can be linked to either an alarm event of a specific severity or a backup protection module becoming active. Each GPO circuit can carry up to ±75 volts with a 300 Ohm load. The corresponding LED below each GPO pair illuminates whenever the system is powered and the GPO circuit is closed. All GPOs circuits are closed when the NetVX™ is not powered.

GPI Each GPI pair is composed of a 5 volt source and a ground. The GPI is triggered when the system senses at minimum of 5 milliamperes of current. The corresponding LED below each GPI pair illuminates whenever the NetVX™ is powered and the GPI is triggered.

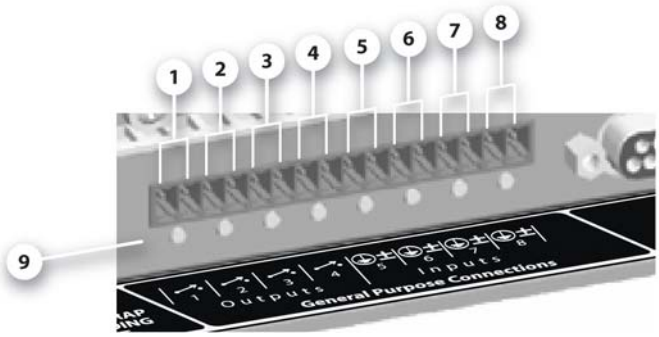


Figure 5-8 GPI/GPO Pin Locations

Table 5-9 GPI/GPO Pinouts

Item	Name	Pin	Signal	Function
1	GPO 1	1	—	Power OFF Circuit closed Power ON Circuit normally open, relay-controlled contact closures linked by software to alarm/fault conditions.
		2	—	
2	GPO 2	3	—	
		4	—	
3	GPO 3	5	—	
		6	—	
4	GPO 4	7	—	
		8	—	
5	GPI 1	9	Ground	Input triggered by closing circuit between contacts. Status indicates ‘Closed’ when at least 5 milliamperes of current flowing to Ground is detected.
		10	+5 volts	
6	GPI 2	11	Ground	
		12	+5 volts	
7	GPI 3	13	Ground	
		14	+5 volts	
8	GPI 4	15	Ground	
		16	+5 volts	
9	Row of LEDs	—	—	Indicate when the GPO/GPI pair above is triggered.

5.8 NetVX™ SYS-1700 Chassis Parts List

Table 5-10 lists enclosure-related part numbers and descriptions.

Table 5-10 SYS-1700 Chassis Parts List

SYS-1700 Part	Description
SYS-1700-AC-STD-IA	See Table 5-3 SYS-1700 Chassis Types and Features on page 52 for details.
SYS-1700-AC-STD-VIP	See Table 5-3 SYS-1700 Chassis Types and Features on page 52 for details.
SYS-1700-AC-MHE	See Table 5-3 SYS-1700 Chassis Types and Features on page 52 for details.
SYS-1700-AC-MHES	See Table 5-3 SYS-1700 Chassis Types and Features on page 52 for details.
SYS-1700-DC-STD-IA	See Table 5-3 SYS-1700 Chassis Types and Features on page 52 for details.
SYS-1700-DC-STD-VIP	See Table 5-3 SYS-1700 Chassis Types and Features on page 52 for details.
SYS-1700-DC-MHE	See Table 5-3 SYS-1700 Chassis Types and Features on page 52 for details.
SYS-1700-DC-MHES	See Table 5-3 SYS-1700 Chassis Types and Features on page 52 for details.
SYS-1700 Parts	**Description**
FAN-S10	Replaceable Fan Unit (2 per system)
FLT-001	Air Filter Assembly
CIB-S10	Front Panel Controller Assembly
RCB-S10	Rear Connector Board Assembly
EAR-TYS	Universal Rack-mount ears
FLT-001	Air Filter
PAN-B04	4HP Blank Filler Panel (1 module width)
PAN-B08	8HP Blank Filler Panel (1 power supply width)
PAN-B16	16HP Blank Filler Panel (4 module widths)
PWR-AC1	AC Power Supply 90–264V, 3.2A (max) 47–63Hz
PWR-CRD-120	120V AC Power Cord (NEMA 5-15P/IEC320 C-13)
PWR-CRD-220	220V AC Power Cord with wire ends
PWR-FUS-AC	Extra fuses for the SYS-1700-AC
PWR-DC1	DC Power Supply 36–72V, 7.9A
PWR-CRD-48	48V DC Power Cord
PWR-FUS-DC	Extra fuses for the SYS-1700-DC

5.9 NetVX™ SYS-1700 Chassis Specifications

General Specifications

Ambient Temperature

Operating	0°C to 40°C	(32°F to 104°F)
Non-Operating	–40°C to 65°C	(-40°F to 149°F)

Humidity

5%-95% Non-condensing

Internal Design

Application Modules	100 mm x 160 mm

Safety Compliance

SYS-1700-AC, SYS-1700-DC	UL & cUL (United States-UL1950 and Canada-CSA C22.2, No.950)
SYS-1700-AC, SYS-1700-DC	CE

FCC Certification

SYS-1700-AC, SYS-1700-DC	Complies with FCC Subpart 15, Class A

Bandwidth

See Chapter 26: NetVX™ Bandwidth on page 455 for details.

Physical Specifications

SYS-1700-AC, SYS-1700-DC

Height	5 RU	22.23 cm (8.75 inches)
Width	43.18 cm	17 inches, standard 19-inch rack mount
Depth	30.48 cm	12 inches, not including cable allowances
Weight (unpopulated)	8.9 kg	19.6 lbs

Electrical Specifications

SYS-1700-AC	**One Power Supply**	**Two Power Supplies**
Minimum Power Consumption: SYS-1700 + (1 x SYS-A22)	60 W *	85 W *
Maximum Power Consumption: SYS-1700 + (2 x SYS-A22)	325 W *	350 W *
Supply Voltage	90–264 V AC	
Supply Frequency	47–63 Hz	
Power Plug	IEC-C-13	
Protection	3A @ 250V GMC Time Delay Fuse	

SYS-1700-DC	**One Power Supply**	**Two Power Supplies**
Minimum Power Consumption: SYS-1700 + (1 x SYS-A22)	60 W *	85 W *
Maximum Power Consumption: SYS-1700 + (2 x SYS-A22)	325 W *	350 W *
Supply Voltage	40–60 V DC	
Supply Isolation	100V	
Redundant Power Inputs	Terminal Block	
Protection	6A @ 250V GMC Time Delay Fuse	

* To estimate the overall power consumption of a populated SYS-1700 AC system, sum the ‘Minimum Power Consumption’ figure listed on this page along with the ‘Power Consumption’ value for each module in the SYS-1700 chassis. The ‘Power Consumption' value is provided on the specifications page for each module in this document.

Chapter 6: NetVX™ SYS-1700 Installation Procedures

6

1 Unpack the Enclosure
   - Unpack the NetVX™.
   - Save the box and foam packaging in case the system needs to be shipped to another location or returned for repair.

2 Install the Enclosure
   - Install the SYS-1700 enclosure in a 19-inch rack.
   - Use the four rack mounting screws (not included) at the locations “1” shown in Figure 6-1 below.

Figure 6-1 SYS-1700 Rack Mount Screw Locations

Note: To mount the enclosure in a 23-inch rack, remove the four screws holding each ear onto the enclosure (locations “2” in Figure 6-1). Position each rack mount ear so that the small face (shown receiving the rack-mount screws in the above diagram) is flush against the side of the unit. Replace each rack mount ear’s four mounting screws to secure the ears to the enclosure. Install the enclosure in the 23-inch rack using rack mount screws at locations “1” in Figure 6-1.

3 Power Wiring: Use the appropriate procedure below to wire and power the NetVX™.
   - Section 6.1.1, "Model SYS-1700-AC Power Wiring Procedure" on page 63.
   - Section 6.1.2, "Model SYS-1700-DC Power Wiring Procedure" on page 64.

Control Connection Wiring

4 Wire the system’s craft port, serial ports, and Ethernet port as shown in Figure 5-7, "SYS-1700 Serial Port and Control Wiring" on page 57.

Step 5: IP Address Configuration

The NetVX™ must be configured with an IP address to do any of the following.

- Use the Vidiem™ Element Management System for system control.
- Access the system using Telnet.
- Upgrade the NetVX™

5 Use either of the following procedures to set the NetVX™'s IP address.

- Section 6.2.2, "Ethernet IP Address Configuration: Craft Port Interface" on page 65
- Section 8.3, "How to Set the System's Ethernet IP Address" on page 73

6.1 SYS-1700 Power Wiring Procedures

6.1.1 Model SYS-1700-AC Power Wiring Procedure

Use this procedure to connect the NetVX™ Model SYS-1700-AC to a 120V AC power source.

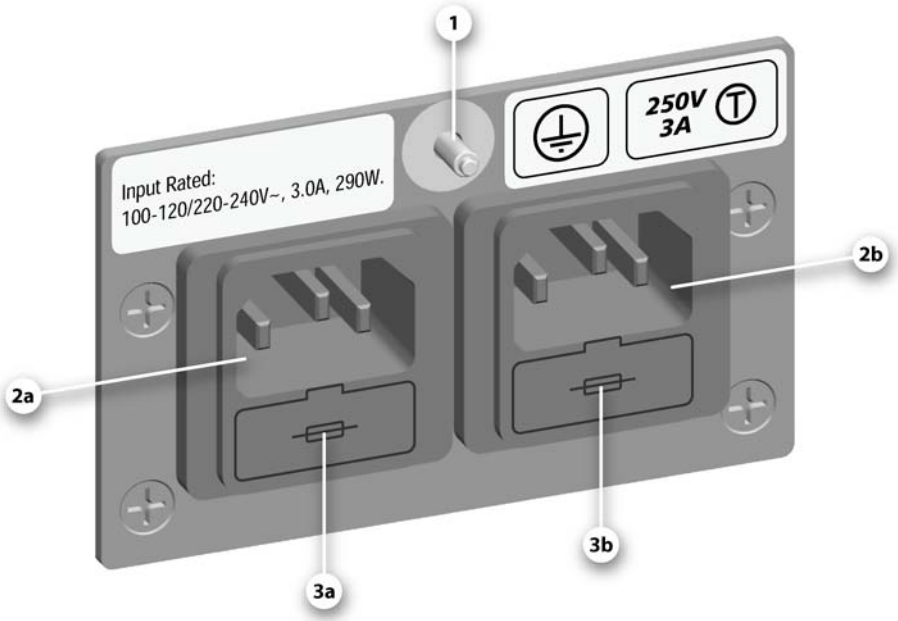


Figure 6-2 SYS-1700-AC Power Interface

1. Turn the power source OFF.
2. Connect the NetVX™'s chassis grounding lug (item 1 in Figure 6-2) to a common ground external to the system.
3. Connect the supplied AC power cord to the primary AC receptacle (item 2a) and to a properly grounded 110/220 VAC power source.
4. If your system uses a secondary power module for power redundancy, connect the second AC power cord to the secondary AC receptacle (item 2b) and to a properly grounded 110/220 VAC power source.
5. Turn the power source ON.

6.1.2 Model SYS-1700-DC Power Wiring Procedure

Use this procedure to connect the NetVX™ Model SYS-1700-DC to a 48V DC power source.

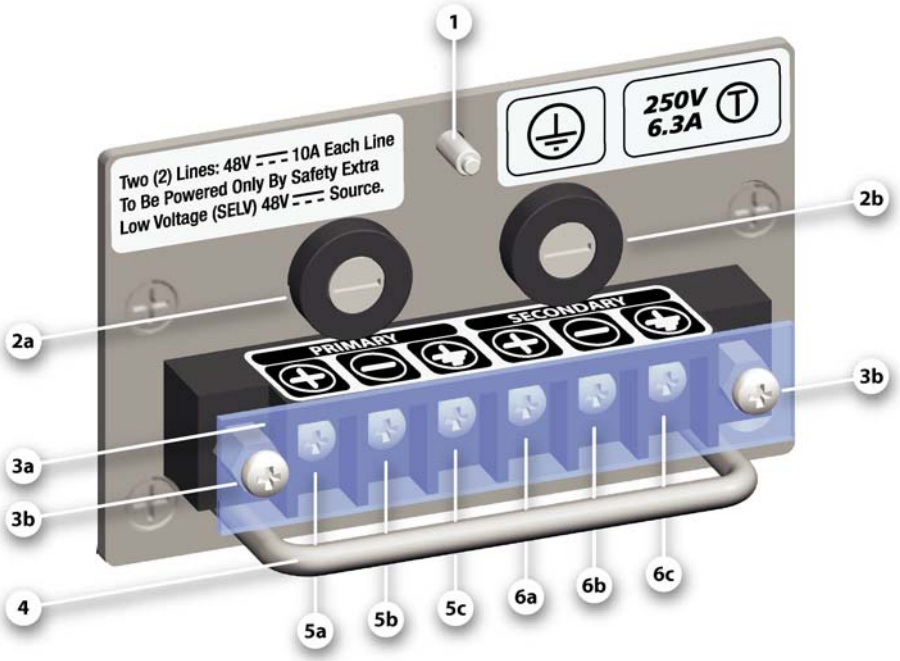


Figure 6-3 SYS-1700-DC Power Interface

Power Wiring

1. Turn the 48V DC power source OFF.
2. Connect the NetVX™'s chassis grounding lug (item 1 in Figure 6-3) to a common ground external to the system.
3. Remove the barrier strip cover (item 3a) by removing its mounting screws (items 3b).
4. Wire the system's DC power connections.
   - Wire the NetVX™'s primary DC ground terminal (item 5c) to the primary 48V DC power supply's ground terminal.
   - Wire the NetVX™'s primary DC negative terminal (item 5b) to the primary 48V DC power supply's negative terminal.
   - Wire the NetVX™'s primary DC positive terminal (item 5a) to the primary 48V DC power supply's positive terminal.
5. If your system uses a secondary power module for power redundancy, then repeat the items in step 4 (above) using the secondary power terminals and secondary power supply instead of the primary.
6. Double check that the wiring is correct.
7. Replace the barrier strip cover (item 3a) and its mounting screws (items 3b).
8. Use plastic wire ties (not included) to tie each power wire to the strain relief bar (item 4).
9. Apply power to the system.

6.2 Ethernet IP Address Configuration Procedures

6.2.1 Ethernet IP Address Configuration: Front Panel Interface

See Section 8.3, "How to Set the System's Ethernet IP Address" on page 73.

6.2.2 Ethernet IP Address Configuration: Craft Port Interface

⚠ CAUTION!

Do not use a null-modem cable for the craft port connection.

1. Connect a PC or UNIX terminal to the "Craft Port" connection using a "straight-through" cable.
2. Configure the terminal application to use the following settings.
   - Bits per second: 9600
   - Data Bits: 8
   - Parity: None
   - Stop Bits: 1
   - Flow Control: None
3. Type the following and press "Enter" to set the IP address.

   ```
   cfg/sys/ip/eth ipaddr=#.#.#.#[1]
   ```
4. Type the following and press "Enter" to set the IP subnet mask.

   ```
   cfg/sys/ip/eth ipgate=#.#.#.#
   ```
5. Type the following and press "Enter" to set the IP gateway address.

   ```
   cfg/sys/ip/eth ipmask=#.#.#.#
   ```
6. Type the following and press "Enter" to activate changes to these IP settings.

   ```
   util ip update
   ```

1. Use the system's IP addresses in place of the #.#.#.# shown in these examples.

6.3 NetVX™ SYS-1700 Application Module Installation

Abstract: *The NetVX™ is shipped with modules already installed. Use these guidelines and procedures in the event you need to install an additional module, or remove a module for servicing.*

6.3.1 Overview of Module Location Restrictions

Some modules are subject to the installation location restrictions shown in the table below.

Table 6-1 NetVX™ Module Location Restrictions

Module Type	Possible Slot Locations			Additional Requirements
	SYS-1700	SYS-300	SYS-200	
SYS-G10	1, 2	—	—	None
SYS-A12	1, 2	1 Fixed	—	None
SYS-A22	1, 2	1 Fixed	1 Fixed	None
DEC-S11	3–17	2–4	3, 4	None
ENC-S11	3–17	2–4	3, 4	None
ENC-H11	3–17	NA	NA	SYS-1700 – The slot to the immediate right of this module must not be populated in order to allow for cooling.
ENC-S21	3–17	NA	NA	SYS-1700 – The slot to the immediate right of this module must not be populated in order to allow for cooling.
AUD-D14	3–17	2–4	3, 4	None
ATM-M11	3–17	2–4	3, 4	None
ATM-S11	3–17	2–4	3, 4	None
ATM-L11	3–17	2–4	3, 4	None
GBE-C11	3–17	2–4	3, 4	None
TMX-M12	3–17	2–4	3, 4	None
NA = Not Allowed	— = Not Present		Fixed = Embedded module, fixed location.	

⚠ WARNING!

All empty slots must be covered with filler panels to ensure proper ventilation and EMI shielding.

6.3.2 How To Install a NetVX™ Module

Prerequisites

- At all times during this procedure, wear a grounding wrist strap connected to the grounding terminal located on the rear, bottom-left corner of the system.
- Be sure to place any module that is not installed in the system in an electrostatically-safe bag, or on an electrostatically-safe surface.

Procedure

1. Carefully align the module's printed circuit board with the PCI guide rails.
2. Slide the module in until it meets resistance.
3. Use the injector/ejector handle to fully engage the module with the backplane. The ejector release button (on modules with this button) clicks when the module is fully engaged.

⚠ WARNING!

Never force a module to engage the backplane! If the module does not seem to engage the backplane properly using the injector/ ejector handle, then remove the module. Inspect both the module and the backplane for foreign objects, and bent or broken pin connectors.

4. Install filler panels over any empty slots.

⚠ WARNING!

All empty slots must be covered with filler panels to ensure proper ventilation and EMI shielding.

6.3.3 How To Remove a NetVX™ Application Module

Prerequisites

- At all times during this procedure, wear a grounding wrist strap connected to the grounding terminal located on the rear, bottom-left corner of the system.
- Be sure to place any module that is not installed in the system in an electrostatically-safe bag, or on an electrostatically-safe surface.

Procedure

1. Press the ejector release button on the injector/ejector handle and wait until the blue hot swap ejection indicator LED illuminates.
2. Use the injector/ejector handle to fully disengage the module from the backplane.
3. Slide the module from the unit.
4. Place the module in an electrostatically-safe bag, or on an electrostatically-safe surface.
5. Install filler panels over any empty slots.

⚠ WARNING!

All empty NetVX™ module slots must be covered with filler panels to ensure proper cooling ventilation and EMI shielding.

Chapter 7: NetVX™ SYS-1700 Maintenance Procedures

7

7.1 How to Service the SYS-1700's Air Filter

The maintenance of the enclosure is minimal and simply requires cleaning the air intake filter on the front facade. Under normal "clean air" operating conditions the air filter should be checked, and cleaned if necessary, every three months. If the site becomes particularly dusty for any reason clean the air filter immediately.

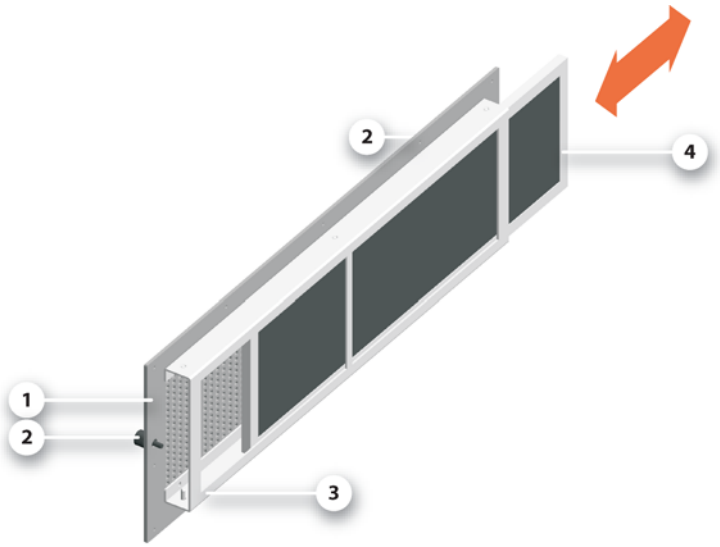


Figure 7-1 SYS-1700 Front Facade and Air Filter Housing

Table 7-1 SYS-1700 Front Facade and Air Filter Housing

Item	Description
1	Front Facade
2	Front Thumbscrew Locations
3	Air Filter Housing
4	Air Filter

1. On the front of the NetVX™, fully loosen the thumbscrews (2) located on the front of the system. See item 4 in Figure 5-1, "SYS-1700 Chassis – Front View" on page 50 for thumbscrew locations.
2. Remove the front facade (1) and locate the air filter housing (3) on the back (inside) of the facade.

Note: Note the orientation of the filter element. Specifically note the side of the filter that receives the intake air. When reinstalling the filter element, ensure that the filter is installed in the same orientation.

3. Slide the air filter (4) out from the air filter housing (3).
4. Vacuum the filter from side that faces out when the filter is installed.
5. Reinstall the filter in the same orientation that is was in when removed.
6. Reinstall the front facade and tighten front facade thumbscrews.

7.2 How to Replace SYS-1700 Fans

The NetVX™ contains two continuously-operating cooling fans units. Use this procedure to replace a fan unit in the event a single fan failure.

⚠ WARNING!

In the unlikely event both fans fail, power down the system immediately in order to avoid damage to the system or its circuit boards.

⚠ WARNING!

Some NetVX™ chassis are equipped with thermostatically-controlled, variable-speed fans. These fans may run more quietly when the ambient temperature is cool, or when fewer modules are installed in the system.

Prerequisites

Observe the following three indicators for notification of a fan failure.

- A trap message.
- A red system LED on the Chassis Interface Board.
- No discernible exhaust emanating from the fan's exhaust port on the rear of the system.

Procedure

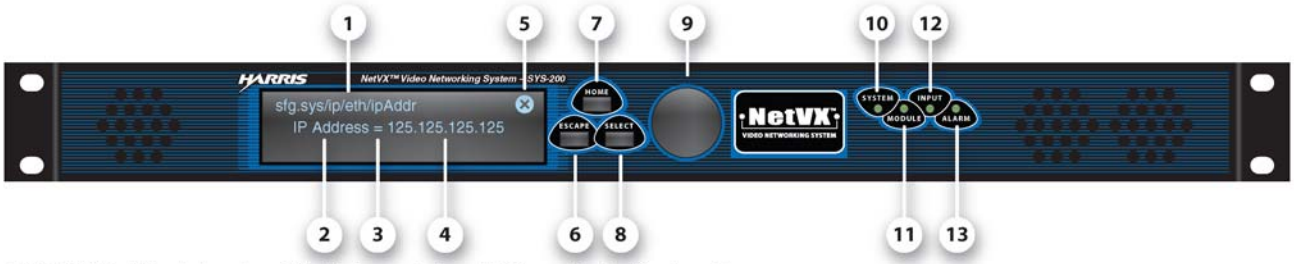
1. Use the three indicators noted above to identify the failed fan unit.
2. On the rear of the NetVX™, fully loosen the thumbscrews located to the left and to the right of the fan exhaust. See item 3 in Figure 5-2, "SYS-1700 Chassis – Rear View" on page 51 for thumbscrew locations.
3. Slide the fan unit from the enclosure.
4. Replace the unit with a new, spare fan unit.
5. Fully tighten the replacement fan's thumbscrews.
6. Check for airflow at the replacement fan's exhaust port to verify that the fan is operational.

Note: in order for the system maintain proper airflow, be sure to leave the failed fan unit in place until a replacement is available

Chapter 8: NetVX™ Front Panel Control Interface

8

8.1 Front Panel Display and Controls



* SYS-200 Front Panel shown here. The display, controls, and LEDs are identical for all models.

Figure 8-1 NetVX™ Front Panel Interface (SYS-1700 shown)

Table 8-1 NetVX™ Front Panel Interface

#	Description	Function
1	Command Path	Displays options selected to reach the current location in the command tree.
2	Configuration Parameter	When shown, indicates the current item in the command tree available for viewing or for setting.
3	State Indicator	Indicates the relationship between the configuration parameter and the value shown. = Indicates that the value shown is currently assigned to the configuration parameter. << Indicates that the value shown is assigned to the configuration parameter if 'Select' is pressed once more.
4	Value	When shown, indicates the value assigned, or about to be assigned, to the configuration parameter.
5	Alarm Icon	When shown, indicates the most severe alarm that is currently asserted; no icon indicates no alarms are asserted. 8.4 Front Panel Display Alarm Icons on page 74 for icon descriptions.
6	Escape Button	When pressed, returns to the previous level of the command tree without making changes.
7	Home Button	When pressed, returns to the top of the command tree without making changes.
8	Select Button	When pressed either: (1) Advances into the selected item in the command tree. -or- (2) When a value is highlighted, sets the configuration parameter to the value shown.
9	Knob	Use in conjunction with the Escape, Home, and Select buttons to highlight items, navigate the command tree, and select values.
10	System LED	**Off** Indicates the system is not powered. **Green** Indicates the NetVX™ is operating normally. **Amber** Indicates either a non-service affecting hardware failure or the system controller is in an unknown state. **Red** Indicates the NetVX™ is out of service, or should be taken out of service because a failure is imminent.

Table 8-1 NetVX™ Front Panel Interface

11	Module LED	**Off** **Green** **Amber** **Red**	Indicates the system is not powered. Indicates fault LEDs on all enabled modules are green. Indicates a module is booting or running diagnostics. Indicates a module should be replaced or repaired.
12	Input LED	**Off** **Green** **Amber** **Red**	Indicates the NetVX™ does not currently contain a module with inputs that are enabled. Indicates input LEDs on all enabled modules are green. Indicates an input is receiving bit errors. Indicates a loss of signal or loss of framing on an input.
13	Alarm LED	**Off** **Green** **Amber** **Red**	Indicates the system is not powered. Indicates no alarms are asserted. Indicates a minor or a warning alarm is asserted. Indicates a major or a critical alarm is asserted.

8.2 Introduction to the Front Panel Interface

The NetVX™'s front panel command tree is structured identically to the craft port command tree. Both trees have the same commands, same command line path elements, same configuration parameters and the same range of values the only difference is the physical interface. The front panel interface mimics the craft port command structure with four initial selection options.

alarm This option opens alarm-related status parameters such as the alarm log. Use the options in this branch to rapidly gather details about alarm events.

config This option provides access to the configuration branch. Use configuration parameters to control the system.

stat This option provides access to the status branch. Use these read-only status parameters to check settings, error counts, statistics, and state for virtually every aspect of the system.

util This option provides access to the utility branch. Use the system's utility parameters to service the system.

The command paths and configuration parameters that follow these high-level selections are documented in the following references.

- See Chapter 23 "Craft Port Command Reference" on page 163 for a long description of every command.
- See Chapter 24 "Craft Port Command Quick Reference" on page 409 for a list of craft port command paths and configuration variables.

Read through the following section to see one example of how a craft port command maps to the front panel interface.

8.3 How to Set the System's Ethernet IP Address

You can set the NetVX™'s Ethernet IP address using the following line at the craft port.

```
cfg/sys/ip/eth ipaddr=123.124.125.126
```

You can also the NetVX™'s Ethernet IP address using the front panel knob in conjunction with the "Select" button. Use these controls to navigate through each section of the command path (ref. Figure 8-1) and make the same setting. The following steps explain how this can be done.

1. Turn the knob as needed to highlight "config", then press the "Select" button.
2. Turn the knob, if needed, to highlight "sys" and press "Select".
3. Turn the knob, if needed, to highlight "ip" and press "Select".
4. Turn the knob, if needed, to highlight "eth" and press "Select".
5. Turn the knob, if needed, to highlight "ipaddr" and press "Select" to highlight the first segment if the IP address (labelled "123" in the example above).
6. Turn the knob as needed to change the value in this segment and press "Select".

Note: Press Escape to return to a previous segment, or press Home to go to the top of the command tree.

7. Repeat Step 6 for each segment. When the last segment is highlighted press "Select" one final time to register the change to this setting. The system saves the setting and moves the cursor to the command path line.
8. Repeat Step 5, but select "ipmask" instead of "ipaddr" to set the IP subnet mask, then proceed through Step 6 and Step 7.
9. Repeat Step 5, but select "ipgate" instead of "ipaddr" to set the IP gateway address, then proceed through Step 6 and Step 7.
10. Use the following series of selections to activate changes to these IP settings.

```
util ip update
```

Note: Use this same basic procedure to use the front panel to access any craft port parameter. Simply select each element of the command path at the front panel until reaching the desired setting, or command.

8.4 Front Panel Display Alarm Icons

An icon in the top right corner of the front panel display indicates an alarm. If more than one alarm is asserted, then the icon indicates the most severe alarm affecting the system. Any of the following items may be displayed.

	No Icon	Indicates no current alarms.
	Warning	Indicates the system is asserting a warning alarm. Warning alarms have the lowest severity level.
	Minor	Indicates the system is asserting a minor alarm. This alarm indicator supersedes the warning severity level alarm indicator.
	Major	Indicates the system is asserting a major alarm. This alarm indicator supersedes any lower severity level alarm indicator.
	Critical	Indicates the system is asserting a critical alarm. Critical alarms have the highest severity level. This alarm indicator supersedes any lower severity level alarm indicator.

Figure 8-2 Front Panel Display Alarm Icons

8.5 Front Panel Interface Real-Time Alarm Monitoring

Use the following steps to monitor NetVX™ alarms in real-time using the front panel.

1. Press “Home”.
2. Select “Alarm”.
3. Select “Current”.

The NetVX™ displays current alarms in chronological order while this selection is selected.

Chapter 9: SYS-A12
System Controller Module

9

9.1 Overview

The NetVX™'s SYS-A12 System Controller Module provides control and management functionality to the entire NetVX™ system. SYS-A12 functions include provisioning, status, fault management, and supervisory control. The SYS-A12 System Controller Module is also designed to provide redundant system control. NetVX™s configured for redundant system control use two SYS-A12s installed in slots one and two.

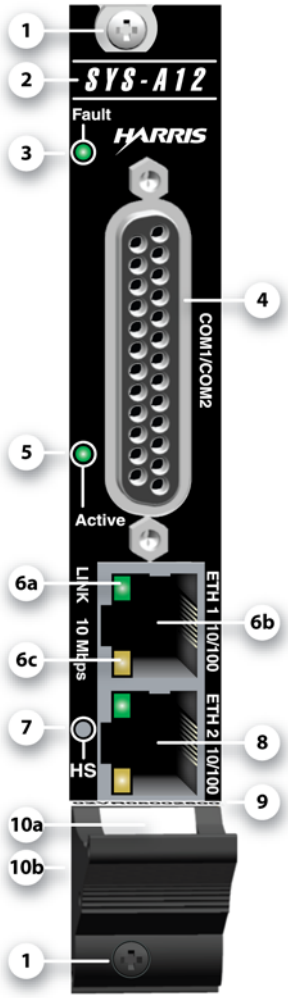


Table 9-1 SYS-A12 Faceplate

#	Label/Description	Function
1	Posidriv captive fasteners	Secures the module in the NetVX™ chassis.
2	Module Identification	Identifies module type and model.
3	Tri-state fault LED	Indicates board state. **OFF** Module not powered. **Green** Module is active and no faults are detected. **Amber** Module is booting, offline, or running diagnostics. **Red** Module has detected a hardware fault and should be replaced.
4	COM1/COM2	Serial communication port interface for ports 1 and 2.
5	Active LED	**ON** Indicates the module is acting as the primary system controller. **OFF** Indicates the module is not acting as the primary system controller.
6a	LINK/ACT (LED)	**Green** (Solid) Indicates link. **Green** (Blinking) Indicates 10/100 BaseT activity. **OFF** Indicates no link.
6b	RJ-45 Connection	10/100 BaseT Ethernet Port 1.
6c	10 Mbps (LED)	**Amber** Indicates 10 BaseT. **OFF** Indicates 100 BaseT.
7	Hot Swap Ejection Indicator LED	**Blue** Module is ready to be removed from the backplane. **OFF** Module is not ready to be removed from the enclosure.
8	RJ-45 Connection	10/100 BaseT Ethernet Port 2. See 6a and 6c above for LED behavior.
9	Module Model Number	Identifies the module model.
10a	Ejector Release Button	Unlocks the ejector/injector handle to allow the module to eject.
10b	Injector/Ejector Handle	Disengages the module from the backplane.

Figure 9-1 NetVX™ SYS-A12 Faceplate

The SYS-A12 includes a 10/100 BaseT Ethernet interface for system control and firmware upgrades. The DB-25 interface provides a connection point for cabling to the system's connection board. The connection board provides interfaces to break out this module's RS-232 and RS-422 serial data signals.

The SYS-A12 is 100 mm high by 20 mm wide. Captive Posidriv fasteners at the top and at bottom of the faceplate secure the module in the NetVX™ enclosure. A injector/ejector handle at the bottom of the faceplate engages and disengages the circuit board from the enclosure.

9.2 Electrical Interfaces

9.2.1 DB-25 COM Port Interface

A cable is provided to connect the SYS-A12's 25-pin COM port to the connector board assembly on the NetVX™ chassis. The connector board breaks out signals for external RS-232 and RS-422 connecting devices. When using redundant system controller modules, the NetVX™ arbitrates between these connections and allows only the current, active system controller to communicate through the connector board's serial port interfaces.

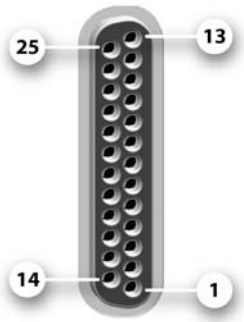


Table 9-2 DB-25 Connection

Item	Pin	Signal	Description
1	1	N.C.	No Connection
	2	TXD	Port B – Serial Data Transmit Positive
	3	RXD	Port B – Serial Data Receive Positive
	4	RTS	Port B – Request to Send
	5	CTS	Port B – Clear to Send
	6	—	—
	7	GND	Signal Ground
	8	—	—
	9	N.C.	No Connection
	10	N.C.	No Connection
	11	—	—
	12	—	—
13	13	CTS	Port A – Clear to Send
14	14	TXD	Port A – Serial Data Transmit Positive
	15	RXD	Port A – Serial Data Receive Positive
	16	RTS	Port A – Request to Send
	17	N.C.	No Connection
	18	N.C.	No Connection
	19	N.C.	No Connection
	20	—	—
	21	N.C.	No Connection
	22	N.C.	No Connection
	23	N.C.	No Connection
	24	N.C.	No Connection
25	25	N.C.	No Connection

Figure 9-2 SYS-A12 DB-25 COM Port Interface

9.2.2 10/100 BaseT Ethernet Connection

Use this port to connect the SYS-A12 to a LAN for system control, status monitoring, and firmware upgrades. A Category 5 cable of up to 1000 meters in length may be used to link the NetVX™ to a hub. The (+) and (-) polarities must be wired correctly for proper operation

Table 9-3 SYS-A12 10/100 BaseT Ethernet Pin Assignments

Item	Pin	Signal	Description
1	1	TX+	Transmit +
	2	TX-	Transmit -
	3	RX+	Receive +
	4	Chassis GND	No connection
	5	Chassis GND	No connection
	6	RX-	Receive -
	7	Chassis GND	No connection
8	8	Chassis GND	No connection

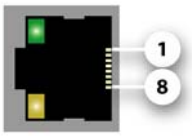


Figure 9-3 SYS-A12 10/100 BaseT Ethernet Interface

9.3 SYS-A12 Parts List

Table 9-4 lists SYS-A12 System Controller Module-related part numbers and descriptions.

Table 9-4 SYS-A12 System Controller Module Parts List

Part	Description
SYS-A12-CTL	System Controller Module
CBA-HD25M-2DB9M	DB-25 Breakout Cable

9.4 SYS-A12 Specifications

General Specifications

Control Protocol

Network	Telnet, SNMP
Local	Local RS-232 Craft-Access port

Alarms

Network	SNMP traps

Control Interface

Type	10/100 Base-T Ethernet (IEEE 802.3)
Connector	RJ-45

Serial Ports

Type	RS-232
Connector	DB-9
Settings	9600, 19200, 38400 bps, 8-bit, no parity, 1-stop bit

Bandwidth

See Chapter 26: NetVX™ Bandwidth on page 455 for details.

Physical Specifications

SYS-A12 System Controller Module

Height	100 mm	
Width	0 20 mm	
Depth	160 mm	
Weight	0.3 kg	(0.6 lbs)

Electrical Specifications

Nominal Specifications

Typical Power Consumption	7 W

*** All specifications are subject to change without notice. ***

Chapter 10: SYS-A22
System Controller Module

10

10.1 Overview

The NetVX™'s SYS-A22 System Controller Module provides control and management functionality to the entire NetVX™ system. SYS-A22 functions include provisioning, status, fault management, and supervisory control. The SYS-A22 System Controller Module is also designed to provide redundant system control. Systems configured for redundant system control use two SYS-A22s installed in slots one and two

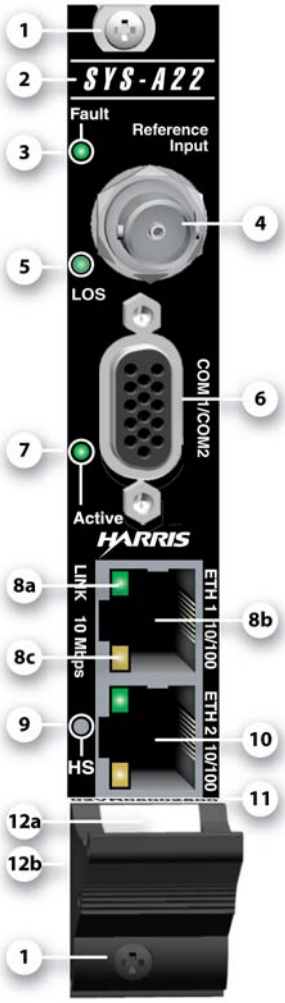


Table 10-1 SYS-A22 Faceplate

#	Label/Description	Function
1	Posidriv captive fasteners	Secures the module in the NetVX™ chassis.
2	Module Identification	Identifies module type and model.
3	Tri-state Fault LED	Indicates board state. **OFF** Module not powered. **Green** Module is active and no faults are detected. **Amber** Module is booting, offline, or running diagnostics. **Red** Module has detected a hardware fault and should be replaced.
4	Reference Input	Receives black-burst input.
5	Reference Input LED	Indicates the state of the reference input. **Green** Indicates the reference signal is present. **OFF** Indicates the reference signal is not present.
6	COM1/COM2	Serial communication port interface for ports 1 and 2.
7	Active LED	**ON** Indicates the module is acting as the primary system controller. **OFF** Indicates the module is not acting as the primary system controller.
8a	LINK/ACT (LED)	**Green** (Solid) Indicates link. **Green** (Blinking) Indicates 10/100 BaseT activity. **OFF** Indicates no link.
8b	RJ-45 Connection	10/100 BaseT Ethernet Port 1.
8c	10 Mbps (LED)	**Amber** Indicates 10 BaseT. **OFF** Indicates 100 BaseT.
9	Hot Swap Ejection Indicator LED	**Blue** Module is ready to be removed from the backplane. **OFF** Module is not ready to be removed from the enclosure.
10	RJ-45 Connection	10/100 BaseT Ethernet Port 2. See 6a and 6c above for LED behavior.
11	Module Model Number	Identifies the module model.
12a	Ejector Release Button	Unlocks the ejector/injector handle to allow the module to eject.
12b	Injector/Ejector Handle	Disengages the module from the backplane.

Figure 10-1 NetVX™ SYS-A22 Faceplate

The SYS-A22 includes a 10/100 BaseT Ethernet interface for system control and firmware upgrades. The DB-25 interface provides a connection point for cabling to the system's connection board. The connection board provides interfaces to break out this module's RS-232 and RS-422 serial data signals.

The SYS-A22 is 100 mm high by 20 mm wide. Captive Posidriv fasteners at the top and at bottom of the faceplate secure the module in the NetVX™ enclosure. A injector/ejector handle at the bottom of the faceplate engages and disengages the circuit board from the enclosure.

Note: The SYS-A22 can serve as a backup module for the SYS-A12. However, the SYS-A12 cannot serve as a backup to the SYS-A22.

10.2 Electrical Interfaces

10.2.1 Reference Input

The reference video input accepts a 300mv black burst input on a BNC interface internally terminated with a 75-Ohm load. When this module is installed and a black-burst signal is received through this interface, any of the system's video and audio outputs can be configured to lock to this reference.

10.2.2 10/100 BaseT Ethernet Connection

Use this port to connect the SYS-A22 to a LAN for system control, status monitoring, and firmware upgrades. A Category 5 cable of up to 1000 meters in length may be used to link the NetVX™ to a hub. The (+) and (-) polarities must be wired correctly for proper operation

Table 10-2 SYS-A22 10/100 BaseT Ethernet Pin Assignments

Item	Pin	Signal	Description
1	1	TX+	Transmit +
	2	TX-	Transmit -
	3	RX+	Receive +
	4	Chassis GND	No connection
	5	Chassis GND	No connection
	6	RX-	Receive -
	7	Chassis GND	No connection
8	8	Chassis GND	No connection

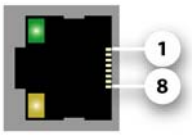


Figure 10-2 SYS-A22 10/100 BaseT Ethernet Interface

10.2.3 COM 1/COM 2 Serial Port Connection

A cable is provided to connect the SYS-A22's 15-pin COM 1/COM2 port to the connector board assembly on the NetVX™ chassis. The connector board breaks out signals for external RS-232 and RS-422 connecting devices. When using redundant system controller modules, the NetVX™ arbitrates between these connections and allows only the current, active system controller to communicate through the connector board's serial port interfaces.

Table 10-3 SYS-A22 HD-15 Connection Pin Assignments

Pin	Signal	Description
1	DCD0	Loopback to pins 6, 13
2	RxD0	Craft Port -> SYS-A22
3	TxD0	SYS-A22 -> Craft Port
4	RxD1	CIB -> SYS-A22
5	TxD1	SYS-A22 -> CIB
6	DSR0	Loopback to pins 1, 13
7	RTS0	SYS-A22 -> Craft Port
8	CTS0	Craft Port -> SYS-A22

Table 10-3 SYS-A22 HD-15 Connection Pin Assignments

Pin	Signal	Description
9	N.C.	—
10	N.C.	—
11	N.C.	—
12	RTS1	SYS-A22 -> CIB
13	DTR0	Loopback to pins 1, 6
14	GND	—
15	CTS1	CIB -> SYS-A22

10.3 SYS-A22 Parts List

Table 10-4 lists SYS-A22 System Controller Module-related part numbers and descriptions.

Table 10-4 SYS-A22 System Controller Module Parts List

Part	Description
SYS-A22-CTL	System Controller Module
CBAHD15M-2DB9M	HD-15 breakout cable

10.4 SYS-A22 Specifications

General Specifications

Control Protocols

Network ..... HTTP, Telnet, SNMP
Local ..... Local RS-232 Craft-Access port

Alarms

Network ..... SNMP traps

Control Interface

Type ..... 10/100 Base-T Ethernet (IEEE 802.3)
Connector RJ-45

Serial Ports

Type RS-232
Connector DB-9
Settings ..... 9600, 19200, 38400 bps, 8-bit, no parity, 1-stop bit

Reference Input

Type ..... Black Burst Composite Video Reference
Connector ..... BNC with Passive Loop Through
Standard ..... SMPTE RP-154

Bandwidth

See Chapter 26: NetVX™ Bandwidth on page 455 for details.

Physical Specifications

SYS-A22 System Controller Module

Height ..... 100 mm
Width ..... 20 mm
Depth ..... 160 mm
Weight ..... 0.3 kg (0.6 lbs.)

Electrical Specifications

Nominal Specifications

Typical Power Consumption ..... 10 W

*** All specifications are subject to change without notice. ***

Chapter 11: ATM-M11, ATM-S11

ATM Network Interface Modules

11

11.1 Overview

The ATM-M11 and ATM-S11 modules provide full-duplex 155 Mbps SONET/SDH optical interface and a full-duplex 35/45 Mbps PDH electrical interface. These interfaces support Asynchronous Transfer Mode (ATM) circuit connections. ATM facilitates the full multiplexing of video, audio, data, and control traffic over the same physical interface. These ATM modules are engineered in coordination with a wide range of telecommunication standards to assure inter-operation with most standards-compliant equipment.

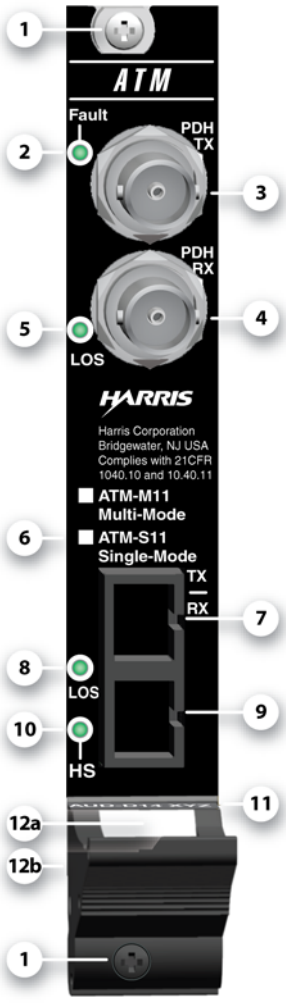


Table 11-1 ATM-M11 and ATM-S11 Faceplate

#	Label/Description	Function
1	Posidriv captive fasteners	Secures the module in the NetVX™ chassis.
2	Tri-state fault LED	Indicates board state. **Off** Module not powered. **Green** Module is active and no faults are detected. **Amber** Module is booting, offline, or running diagnostics. **Red** Module has detected a hardware fault and should be replaced.
3	PDH TX	PDH DS-3/E3 transmit jack.
4	PDH RX	PDH DS-3/E3 receive jack.
5 , 8	Tri-state line status LED(s)	Indicates the state of the signal entering the adjacent (optical or electrical) receive connector. **Off** This interface is not configured for use. **Green** No error indications. **Amber** Bit errors or AIS received. **Red** Loss of signal or loss of framing.
6	Module Identification	Checkmark identifies module type and model.
7	TX (SONET/SDH)	Optical transmit jack.
9	RX (SONET/SDH)	Optical receive jack.
10	Hot Swap Ejection Indicator LED	**Off** Module is not ready to be removed from the enclosure. **Blue** Module is ready to be removed from the backplane.
11	Module Model Number	Identifies the module model.
12a	Ejector Release Button	Unlocks the ejector/Injector handle to allow the module to eject.
12b	Injector/Ejector Handle	Disengages the module from the backplane.

Figure 11-1 NetVX™ ATM-M11 and ATM-S11 Faceplates

The module's optical interface is pre-configured[1] to accept either multi-mode or single-mode connections. Each ATM module supports 63 AAL-1 or 255 AAL-5 permanent virtual circuits (PVCs). Up to 63 virtual circuits may be allocated for handling MPEG-2 transport stream input. Similarly, as many as 63 virtual circuits may be allocated for handling MPEG-2 transport stream output. The module can maintain desired output bandwidth on a per VC basis using a CBR, VBR mode.

1. The mode is indicated on the module faceplate.

The ATM-M11 and ATM-S11 modules are 100 mm high by 20 mm wide. Captive Posidriv fasteners at the top and at bottom of the faceplate secure the module in the NetVX™ enclosure. A injector/ejector handle at the bottom of the faceplate engages and disengages the circuit board from the enclosure.

11.2 Electrical and Optical Interfaces

11.2.1 PDH DS3/E3 Interface

The ATM-M11 and ATM-S11 modules provide a full-duplex PDH DS3/E3 interface through the PDH connector pair. This pair consists of 2 BNC jacks labeled “PDH TX”, and “PDH RX”. The PDH TX jack transmits and the PDH RX jack receives. Connect the PDH TX and RX jacks to the DS3/E3 network equipment with 75 Ohm characteristic impedance coaxial cables that meet the requirements of ITU-T 703.

⚠ WARNING!

The DS3 interface is intended for interconnects within a single facility. The electrical interface is not designed for direct use with connections leaving the interior of the building in which the system is housed.

- For proper operation, the line build-out control must be set correctly on both the NetVX™ and the network equipment to which the NetVX™ is connected. Both the Vidiem™ Element Management System and the craft port command interface (see cfg slot.s/atm/ifc.m ds3lbo) provide line build out controls.
- Cable lengths of less than 150 feet require line build-out set to “IN”.
- Cable lengths between 150 and 450 feet require line build-out to be set to “OUT” for DS3.
- The DS3/E3 signals generated by the ATM-M11 and ATM-S11 modules contain ATM cells. These cells are mapped into the user payload bits according to ITU-T G.752. These DS3/E3 signals are not “channelized” and may cause false alarms conditions on certain legacy transmission equipment. Such errors are typically due to this type of equipment expecting to find voice channel framing in the DS3/E3 signal.

11.2.2 Optical OC-3/STM-1 Interface

The ATM-M11 and ATM-S11 modules provide a full-duplex SONET OC-3/SDH STM-1 interface through the TX/RX optical connector pair. This pair consists of 2 SC (stick and click) optical jacks labelled “TX”, and “RX”. The TX jack transmits and the RX jack receives. Connect the TX and RX jacks to the network equipment using the appropriate optical cables.

⚠ WARNING!

(1) An optical cable rated for the correct mode (single-mode or multi-mode) must be used to interconnect the ATM-M11 or ATM-S11 module to external networking equipment.
(2) For single mode optical applications with very short fiber optic cable lengths, it may be necessary to insert an optical attenuator in-line with the signal in each direction. This practice help to avoid saturating the optical receiver.
(3) The OC-3/STM-1 signals generated by the ATM-M11 are not “channelized” and may cause false alarms conditions on certain legacy transmission equipment. Such errors are typically due to this type of equipment expecting to find voice channel framing in the OC-3/STM-1 signal.

11.3 ATM Module Types and Features

Each NetVX™ ATM module is factory-configured as a particular Module Type. Module Types are composed of a Module Base Type, such as “ATM-M11”, and a suffix, such as “1-1A1”. The Module Type indicates which premium features are present on the module.

Each module is named with a string in the form of ATM-*11. The letter in the position of the asterisk represents the type of laser interface installed on the module. The letter “M” represents multi-mode, “S” represents single-mode, “L” represents single-mode “long-reach”. The single-mode “long reach” is a more powerful laser than the standard single-mode. Table 11-2 below identifies the ATM module types for this model.

Table 11-2 ATM-M11 and ATM-S11 Module Type Definitions

Features	ATM-M11 and ATM-S11 Module Types			
	ATM-M11-1 ATM-S11-1	ATM-M11-1A1 ATM-S11-1A1	ATM-M11-2 ATM-S11-2	ATM-M11-2A1 ATM-S11-2A1
MPEG-2 encapsulation in AAL-5				
MPEG-2 encapsulation in AAL-1				
IP encapsulation in AAL-5				
Traffic Class Prioritization				
Number of concurrently active interfaces per card	1	1	2	2

Legend	
Supported Feature	
Unsupported Feature	

Identical Module Types are required for the following purposes.

- Application module redundancy requires identically keyed main and backup module types. It is possible to use modules with different feature keys provided that (a) All application-specific features are provided by the backup module, and (b) The backup module is configured to its base type. This subject is discussed in greater detail in the Vidiem™ Element Management System help topics, “How to Configure a Backup Module”, and “Overview of Backup Module Compatibility”.
- Like Module Types are required on modules in any two slots between which Profiles may be copied.

11.4 ATM Modules Parts List

Table 11-3 lists ATM Network Interface Module-related part numbers and descriptions.

Table 11-3 ATM Network Interface Module Parts List

Part	Description
ATM-M11	Base Multi-Mode ATM Network Interface Module
ATM-S11	Base Single-Mode ATM Network Interface Module
See Table 11-2 ATM-M11 and ATM-S11 Module Type Definitions on page 86 for details of the following keys.	
ATM-M11-1	Multi-Mode ATM Network Interface Module Feature Key
ATM-S11-1	Single-Mode ATM Network Interface Module Feature Key
ATM-M11-1A1	Multi-Mode ATM Network Interface Module Feature Key
ATM-S11-1A1	Single-Mode ATM Network Interface Module Feature Key
ATM-M11-2	Multi-Mode ATM Network Interface Module Feature Key
ATM-S11-2	Single-Mode ATM Network Interface Module Feature Key
ATM-M11-2A1	Multi-Mode ATM Network Interface Module Feature Key
ATM-S11-2A1	Single-Mode ATM Network Interface Module Feature Key

11.5 ATM-M11 and ATM-S11 Specifications

ATM Network Electrical Interfaces

DS3 ATM Interface

Connector	75 Ohm BNC
Rate	44.736 MHz ±20 ppm
Format	C-Bit Parity or M23
Cell Mapping	PLCP (G.751) or no PCLP
Applicable Standards	Bellcore GR-499-CORE, ANSI T1-107-1988, ITU-T G.703, ITU-T G.704, ITU-T G.804

E3 ATM Interface

Connector	75 Ohm BNC
Rate	34.368 MHz ±20 ppm
Format	G.751, G.832
Cell Mapping	PLCP (G.751) or no PLCP
Standards	ITU-T G.703, G.751, G.832, and G.804

SONET/SDH (General)

Connector	SC-type duplex optical connector
Rate	155.52 MHz ±20 ppm Format
Format	SONET or SDH
Applicable Standards	ATM Forum: User-Network Interface Specification V3.0, 3.1, Bellcore TR-NWT-000253, ANSI T1.105, ITU-T G.707 and I.432

ATM Network Optical Interfaces

SONET/SDH ATM-M11 Multi-Mode Interface

Output Power (min.)	-23 dBm
Output Power (max.)	-14 dBm
Output Center Wavelength	1270 nm–1380 nm
Output Spectral Width	137 nm
Input Power (min.)	-30 dBm
Input Power (max.)	-14 dBm
Operating Wavelength	1260 nm–1360 nm

SONET/SDH ATM-S11 Single-Mode Interface

Output Power (min.)	-15 dBm
Output Power (max.)	-8 dBm
Output Center Wavelength	1260 nm–1380 nm
Output Spectral Width	4 nm
Input Power (min.)	-34 dBm
Input Power (max.)	-7 dBm
Operating Wavelength	1260 nm–1360 nm

General

Maximum Number of MPEG VCs	63

Bandwidth

SeeChapter 26: NetVX™ Bandwidth on page 455 for details.

Physical Specifications

ATM-M11 and ATM-S11 Network Interface Modules

Height	100 mm	
Width	20 mm	
Depth	160 mm	
Weight	0.3 kg	(0.6 lbs)

Electrical Specifications

ATM-M11 Power Consumption	10 W
ATM-S11 Power Consumption	10 W

*** All specifications are subject to change without notice. ***

Chapter 12: ATM-X11

ATM Network Interface Module

12

12.1 Overview

The ATM-X11 module provides a full-duplex 155 Mbps SONET / SDH optical interface and a full-duplex 35/45 Mbps PDH electrical interface. These interfaces support Asynchronous Transfer Mode (ATM) circuit connections. A building integrated timing supply (BITS) master clock interface is also provided for either sending or receiving Stratum clock timing signals.

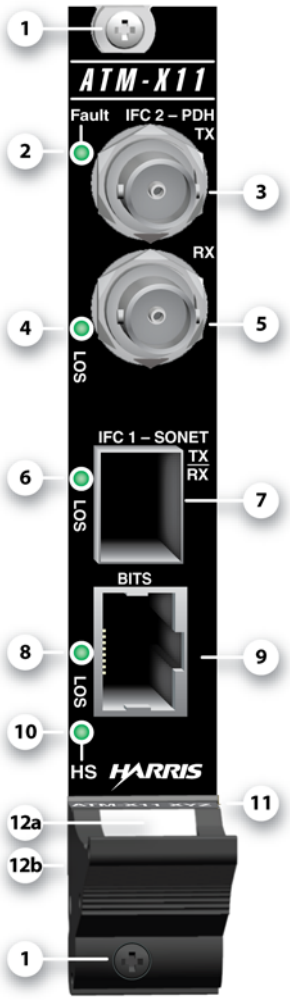


Table 12-1 ATM-X11 Faceplate

	Label/Description	Function
1	Posidriv Captive Fasteners	Secures the module in the NetVX™ chassis.
2	Tri-State Fault LED	Indicates board state. **Off** Module not powered. **Green** Module is active and no faults are detected. **Amber** Module is booting, offline, or running diagnostics. **Red** Module has detected a hardware fault and should be replaced.
3	IFC 2 – PDH TX	PDH DS-3/E3 transmit jack.
4	Tri-State Line Status LED(s)	Indicates the state of the receive signal on the PDH interface. **Off** This interface is not configured for use. **Green** No error indications. **Amber** Bit errors or AIS received. **Red** Loss of signal or loss of framing.
5	IFC 2 – PDH RX	PDH DS-3/E3 receive jack.
6	Tri-State Line Status LED(s)	Indicates the state of the receive signal on the SONET SPF interface (if present). **Off** This interface is not configured for use. **Green** No error indications. **Amber** Bit errors or AIS received. **Red** Loss of signal or loss of framing.
7	IFC 1 – SONET TX/RX	Opening for Small Form-Factor Pluggable (SFP) I/O module. See Section 12.2.3 SFP Interface on page 91
8	BITS Interface	Transmits or receives BITS Master Clock timing.
9	Tri-State Line Status LED(s)	Indicates the state of the receive signal on the BITS interface (in receive mode). **Off** This interface is not configured for use. **Green** No error indications. **Amber** Bit errors or AIS received. **Red** Loss of signal or loss of framing.
10	Hot Swap Ejection Indicator LED	**Off** Module is not ready to be removed from the enclosure. **Blue** Module is ready to be removed from the backplane.
11	Module Model Number	Identifies the module model.
12a	Ejector Release Button	Unlocks the ejector/Injector handle to allow the module to eject.
12b	Injector/Ejector Handle	Disengages the module from the backplane.

Figure 12-1 NetVX™ ATM-X11 Faceplates

The ATM-X11 ATM module is engineered in coordination with a wide range of telecommunication standards to assure inter-operation with most standards-compliant equipment. The ATM-X11's SFP socket supports both STM-1e and multi-mode or single-mode optical interface connections complying to the Small Form Factor Pluggable (SFP) Multi-Source Agreement (MSA)".

Each ATM-X11 module supports 63 AAL-1 or 255 AAL-5 permanent virtual circuits (PVCs). Up to 63 virtual circuits may be allocated for handling MPEG-2 transport stream input. Similarly, as many as 63 virtual circuits may be allocated for handling MPEG-2 transport stream output. The module can maintain desired output bandwidth on a per VC basis using a CBR, VBR mode.

The ATM-X11 module is 100 mm high by 20 mm wide. Captive Posidriv fasteners at the top and at bottom of the faceplate secure the module in the NetVX™ enclosure. A injector/ejector handle at the bottom of the faceplate engages and disengages the circuit board from the enclosure.

12.2 Electrical and Optical Interfaces

12.2.1 Electrical PDH DS3/E3 Interface

The ATM-X11 modules provide a full-duplex PDH DS3/E3 interface through the PDH connector pair. This pair consists of 2 BNC jacks labeled "PDH TX", and "PDH RX". The PDH TX jack transmits and the PDH RX jack receives. Connect the PDH TX and RX jacks to the DS3/E3 network equipment with 75 Ohm characteristic impedance coaxial cables that meet the requirements of ITU-T 703.

⚠ WARNING!

The DS3 interface is intended for interconnects within a single facility. The electrical interface is not designed for direct use with connections leaving the interior of the building in which the system is housed.

- For proper operation, the line build-out control must be set correctly on both the NetVX™ and the network equipment to which the NetVX™ is connected. Both the Vidiem™ Element Management System and the craft port command interface (see cfg slot.s/atm/ifc.m ds3lbo) provide Line Build Out (LBO) controls.
- Cable lengths of less than 150 feet require line build-out set to "IN".
- Cable lengths between 150 and 450 feet require line build-out to be set to "OUT" for DS3.
- The DS3/E3 signals generated by the ATM-X11 modules contain ATM cells. These cells are mapped into the user payload bits according to ITU-T G.752. These DS3/E3 signals are not "channelized" and may cause false alarms conditions on certain legacy transmission equipment. Such errors are typically due to this type of equipment expecting to find voice channel framing in the DS3/E3 signal.

12.2.2 Electrical BITS Interface

The ATM-X11's BITS master clock interface has a software-selection for operating in either "Receive" or "Transmit" mode. In "Transmit" mode the ATM-X11 derives timing from the incoming SONET signal and transmits this timing to external equipment through the BITS interface. In "Receive" mode BITS Master Clock timing is received through the BITS interface and is applied to the SONET interface's transmit signal.

12.2.3 SFP Interface

The ATM-X11's SFP socket allows the module to be fitted with an SFP interface connection complying to the "SFP (Small Form Factor Pluggable) Multi-Source Agreement (MSA)". Harris provides one of the following modules with each ATM-X11 model that include an SFP.

Note: Each ATM-X11 module is intended for operation with a specific SFP module. Refer to "ATM-X11 Parts List" on page 94 for a complete list of all modules and their respective SFP part numbers.

Use the following images to identify and installed SFP module.

Figure 12-2 Stratos Multi-Mode SFP — Mfg. Part #: SPLC-20-2-4-B-R6 — Harris Part #: ATM-OPT-MM

Figure 12-3 Stratos Single-Mode Intermediate-Reach SFP — Mfg. Part #: SPLC-20-2-2M-B-R6 — Harris Part #: ATM-OPT-SM

Figure 12-4 Opnext Single-Mode Long-Reach SFP — Mfg. Part #: TRF5456AVLB300 — Harris Part #: ATM-OPT-LR

Figure 12-5 Teridian STM-1e SFP — Mfg. Part #: SFP-6500-08 — Harris Part #: ATM-ELEC-1E

ATM-X11 modules that include the Teridian STM-1e, also include two of the following cables (below).

Figure 12-6 STM-1e Cable; DIN 1.0/2.3 Type D and BNC Coax Connector Ends — Harris Part #: ATM-X11-STMCBL

⚠ WARNING!

The SFP module, the external networking equipment, and the cable connecting the these two pieces of equipment must all be the same mode (single-mode or multi-mode) otherwise errors will occur.

Note: (1) For single mode optical applications with very short fiber optic cable lengths, it may be necessary to insert an optical attenuator in-line with the signal in each direction. This practice help to avoid saturating the optical receiver.
(2) The OC-3/STM-1 signals generated by the ATM-M11 are not 'channelized' and may cause false alarms conditions on certain legacy transmission equipment. Such errors are typically due to this type of equipment expecting to find voice channel framing in the OC-3/STM-1 signal.

12.3 ATM-X11 Module Types and Features

Each NetVX™ ATM-X11 module is factory-configured as a particular Module Type. Module Types are composed of a Module Base Type, such as “ATM-X11”, and a suffix, such as “1-1A1”. The Module Type indicates which premium features are present on the module. Table 12-2 below identifies all ATM Module Types.

Table 12-2 ATM-X11 Module Type Definitions

Features	ATM-X11 Module Types					
	SFP Not Included		SFP Included			
	ATM-X11-1	ATM-X11-1A1	ATM-X11-*1 ATM-X11-M1 ATM-X11-S1 ATM-X11-L1 ATM-X11-E1	ATM-X11-*1A1 ATM-X11-M1A1 ATM-X11-S1A1 ATM-X11-L1A1 ATM-X11-E1A1	ATM-X11-*2 ATM-X11-M2 ATM-X11-S2 ATM-X11-L2 ATM-X11-E2	ATM-X11-*2A1 ATM-X11-M2A1 ATM-X11-S2A1 ATM-X11-L2A1 ATM-X11-E2A1
MPEG-2 Encapsulation in AAL-5						
MPEG-2 Encapsulation in AAL-1						
IP Encapsulation in AAL-5						
Traffic Class Prioritization						
One (1) Active Interface Per Card						
Two (2) Active Interfaces Per Card						
* = Denotes the SFP Module Type M =Multi-Mode SFP S = Single-Mode SFP L = Long-Reach SFP E = STM-1e SFP						

Legend	
Supported Feature	
Unsupported Feature	

Identical Module Types are required for the following purposes.

- Application module redundancy requires identically keyed main and backup module types. It is possible to use modules with different feature keys provided that (a) All application-specific features are provided by the backup module, and (b) The backup module is configured to its base type. This subject is discussed in greater detail in the Vidiem™ Element Management System help topics, “How to Configure a Backup Module” and “Overview of Backup Module Compatibility”.
- Like Module Types are required on modules in any two slots between which Profiles may be copied.

Note: An ATM-X11 module can back up any other ATM module. When using optical interfaces, ensure that the interface types (single-mode, multi-mode, or long-reach) are matching on both the main and the backup module before configuring the backup.

12.4 ATM-X11 Parts List

Table 12-3 lists ATM-X11 module-related part numbers and descriptions.

Table 12-3 ATM-X11 ATM Network Interface Module Parts List

Harris Part Number	SFP Description	SFP Manufacturer	SFP Manufacturer Part #
ATM-X11	Base ATM Network Interface Module	—	—
See Table 12-2 ATM-X11 Module Type Definitions on page 93 for complete feature details regarding each of the following keys.			
ATM-X11-1	This model does not include an SFP module.	—	—
ATM-X11-1A1	This model does not include an SFP module.	—	—
ATM-X11-M1	SFP w/Multi-Mode Laser	Stratos Lightwave	SPLC-20-2-4-B-R6
ATM-X11-M1A1	SFP w/Multi-Mode Laser	Stratos Lightwave	SPLC-20-2-4-B-R6
ATM-X11-M2	SFP w/Multi-Mode Laser	Stratos Lightwave	SPLC-20-2-4-B-R6
ATM-X11-M2A1	SFP w/Multi-Mode Laser	Stratos Lightwave	SPLC-20-2-4-B-R6
ATM-X11-S1	SFP w/15 Kilometer Intermediate-Reach Laser	Stratos Lightwave	SPLC-20-2-2M-B-R6
ATM-X11-S1A1	SFP w/15 Kilometer Intermediate-Reach Laser	Stratos Lightwave	SPLC-20-2-2M-B-R6
ATM-X11-S2	SFP w/15 Kilometer Intermediate-Reach Laser	Stratos Lightwave	SPLC-20-2-2M-B-R6
ATM-X11-S2A1	SFP w/15 Kilometer Intermediate-Reach Laser	Stratos Lightwave	SPLC-20-2-2M-B-R6
ATM-X11-L1	SFP w/40 Kilometer Long-Reach Laser	Opnext	TRF5456AVLB300
ATM-X11-L1A1	SFP w/40 Kilometer Long-Reach Laser	Opnext	TRF5456AVLB300
ATM-X11-L2	SFP w/40 Kilometer Long-Reach Laser	Opnext	TRF5456AVLB300
ATM-X11-L2A1	SFP w/40 Kilometer Long-Reach Laser	Opnext	TRF5456AVLB300
ATM-X11-E1	STM-1e(ES1) SFP	Teridian	SFP-6500-08
ATM-X11-E1A1	STM-1e(ES1) SFP	Teridian	SFP-6500-08
ATM-X11-E2	STM-1e(ES1) SFP	Teridian	SFP-6500-08
ATM-X11-E2A1	STM-1e(ES1) SFP	Teridian	SFP-6500-08
Part	**Description**		
ATM-X11-STMCBL	DIN 1.0/2.3 (75 Ohm) Type D to BNC Coax Cable	Response Microwave	RMCA39.BNC.1.0
ATM-X11-STM1E	STM-1e(ES1) SFP	Teridian	SFP-6500-08

12.5 ATM-X11 Specifications

ATM Network Electrical Interfaces

DS3 ATM Interface

Connector	75 Ohm BNC
Rate	44.736 MHz ± 20 ppm
Format	C-Bit Parity or M23
Cell Mapping	PLCP (G.751) or no PCLP
Applicable Standards	Bellcore GR-499-CORE, ANSI T1-107-1988, ITU-T G.703, ITU-T G.704, ITU-T G.804

E3 ATM-X11 Multi-Mode

Connector	75 Ohm BNC
Rate	34.368 MHz ± 20 ppm
Format	G.751, G.832
Cell Mapping	PLCP (G.751) or no PLCP
Standards	ITU-T G.703, G.751, G.832, and G.804

SFP Interface: STM1e (ES1) ATM Module

Manufacturer	Teridian
Part Number	SFP-6500-08
Connector Type	DIN 1.0/2.3 Female Coaxial Connector
Ejector	Bail Actuator
Connector Coupling	Type A or Type D
Load	75 Ohm Resistive
Peak-to-Peak voltage	1 ± 0.1 Volt
Rate	155.52 MHz ± 20 ppm
Format	SDH
Cell mapping	ATM Forum: User-Network Interface Specification V3.0
Applicable Standards	ITU-T G.703, ANSI T1.102, Telcordia GR-253-CORE

ATM Network Optical Interfaces

SFP Interface: SONET/SDH ATM-X11 Multi-Mode Laser Module

Manufacturer	Stratos Lightwave
Part Number	SPLC-20-2-4-B-R6
Connector Type	LC
Ejector	Bail Actuator
Output Power (min.)	-20 dBm
Output Power (max.)	-14 dBm
Output Center Wavelength	1260 nm–1360 nm; 1310 nm (typical)
Input Power (min.)	-31 dBm
Input Power (max.)	-14 dBm
Operating Wavelength	1260 nm–1360 nm
Applicable Standards	GR-253 and ITU G.975
FDA Safety Certification	Stratos Lightwave certifies this SFP module complies with FDA 21CFR 1040.10 and 1040.11.

SFP Interface: SONET/SDH ATM-X11 Single-Mode Intermediate-Reach Laser Module

Manufacturer	Stratos Lightwave
Part Number	SPLC-20-2-2M-B-R6
Connector Type	LC
Ejector	Bail Actuator
Output Power (min.)	-15 dBm
Output Power (max.)	-8 dBm
Output Center Wavelength	1266 nm–1360 nm; 1310 nm (typical)
Output RMS Spectral Width	4 nm
Input Power (min.)	-28 dBm
Input Power (max.)	-8 dBm
Input Operating Wavelength	1260 nm–1610 nm
Applicable Standards	GR-253 (IR-1) and ITU G.975 (S-1.1)
FDA Safety Certification	Stratos Lightwave certifies this SFP module complies with FDA 21CFR 1040.10 and 1040.11.

SFP Interface: SONET/SDH ATM-X11 Single-Mode Long-Reach Laser Module

Manufacturer	Opnext
Part Number	TRF5456AVLB300
Connector Type	LC
Ejector	Bail Actuator
Average Optical Output Power (min.)	-5 dBm
Average Optical Output Power (max.)	-0 dBm
Output Center Wavelength	1263 nm–1360 nm
Output RMS Spectral Width	3 nm
Input Power (min.)	-34 dBm
Input Power (max.)	-10 dBm
FDA Safety Certification	Opnext certifies this SFP module complies with FDA 21CFR 1040.10 and 1040.11.

Bandwidth

SeeChapter 26: NetVX™ Bandwidth on page 455 for details.

Physical Specifications

ATM-X11 Network Interface Modules

Height	100 mm
Width	20 mm
Depth	160 mm
Weight	0.3 kg (0.6 lbs)

Electrical Specifications

ATM-X11 Power Consumption	10 W

*** All specifications are subject to change without notice. ***

Chapter 13: GBE-C11

Gigabit Ethernet Network Interface Module

13

13.1 Overview

The GBE-C11 provides the NetVX™ with up to IP connectivity over a full-duplex 1000 BaseT electrical interface. The basic function of the GBE-C11 is to serve as the NetVX™'s Video on IP (VoIP) network interface. In this capacity the GBE-C11 multiplexes MPEG-2 transport streams, originating on other NetVX™ modules, into IP packets for distribution. The GBE-C11 also de-multiplexes incoming Video on IP, performs any Forward Error Correction (FEC), removes network jitter, and provides the resulting signals to other NetVX™ modules as virtual channels.

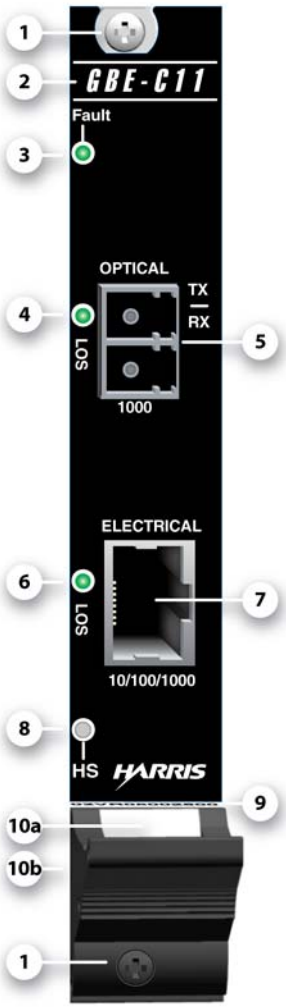


Table 13-1 GBE-C11 Faceplate

#	Label/Description	Function
1	Posidriv captive fasteners	Secures the module in the NetVX™ chassis.
2	Module Identification	Identifies module type and model.
3	Tri-state fault LED	Indicates board state. **Off** Module not powered. **Green** Module is active and no faults are detected. **Amber** Module is booting, offline, or running diagnostics. **Red** Module has detected a hardware fault and should be replaced.
4	LOS LED	Indicates the state of the optical interface. **Off** Indicates the interface is not configured to be active. **Green** Indicates an optical signal is present. **Amber** Ethernet CRC errors detected in the last second. **Red** Indicates a Loss of Signal.
5	SFP Socket	Opening for optional Small Form-Factor Pluggable (SFP) I/O module.
6	LOS LED	Indicates the state of the electrical interface. **Off** Indicates the interface is not configured to be active. **Green** Indicates an electrical signal present. **Amber** Indicates Ethernet CRC errors were detected in the last second. **Red** Indicates a Loss of Signal or Loss of Framing.
7	RJ-45 Connection	10/100/1000 BaseT Electrical Ethernet Port
8	Hot Swap Ejection Indicator LED	**Off** Module is not ready to be removed from the enclosure. **Blue** Module is ready to be removed from the backplane.
9	Module Model Number	Identifies the module model.
10a	Ejector Release Button	Unlocks the injector/ejector handle to allow the module to eject.
10b	Injector/Ejector Handle	Disengages the module from the backplane.

Figure 13-1 NetVX™ GBE-C11 Faceplate

The GBE-C11 is 100 mm high by 20 mm wide. Captive Posidriv fasteners at the top and at bottom of the faceplate secure the module in the NetVX™ enclosure. A injector/ejector handle at the bottom of the faceplate engages and disengages the circuit board from the enclosure.

The GBE-C11 can transmit and receive MPEG transport stream packets as either a UDP data packet or RTP data packet (as defined in RFC 1889 and RFC 2250) stream. A forward error correction block is provided that generates FEC packets over an interleaved data stream for transmission and corrects errors detected in the received stream. The FEC scheme is based upon RFC 2733.

13.2 Physical Interfaces

13.2.1 SFP Socket

The GBE-C11's SFP socket allows the module to be fitted with optical interfaces complying to the "SFP (Small Form Factor Pluggable) Multi-Source Agreement (MSA)".

Note: Be sure to set both the GBE-C11's SFP interface and the equipment to which the GBE-C11 is cabled, to 'Auto-Negotiate' before connecting them to one another. Use the craft port to accomplish this step on the NetVX™ by setting 'cfg slot.s/ip/ifc.m link' to 'optical'. In Vidiem™ set the 'Ethernet Link' drop-down in the 'IP Properties' dialog to 'optical'.

The following two modules are qualified for use in the GBE-C11. These modules can be ordered from Harris Corporation. See Section 13.4, "GBE-C11 Parts List" on page 100 for ordering numbers.

⚠ WARNING!

Only the brands and modules listed below are qualified by the Harris Corporation for use in the GBE-C11.

13.2.1.1 Multi-Mode SFP Module

Figure 13-2 Multi-Mode SFP Module — Stratos Part# SPLC-20-4-1-B — Harris Part # GBE-OPT-MM

13.2.1.2 Single-Mode SFP Module

Figure 13-3 Single-Mode SFP Module — Stratos Part# SPLC-20-4D-2M-B — Harris Part # GBE-OPT-SM

13.2.2 Electrical Gigabit Ethernet Interface

The GBE-C11's electrical interface is an RJ-45 providing full-duplex 10/100/1000 BaseT Gigabit Ethernet connectivity. A Category 5 cable of up to 1000 meters in length may be used to link the NetVX™ to a hub. This interface also supports MDIX so a crossover cable is not required when connecting directly to other equipment.

Note: IMPORTANT! Care must be taken to ensure that the Ethernet ports on both the GBE-C11 and external piece of equipment are set to the same link setting; such as 'Auto', or '1000 Mbps', or '100 Mbps'.

Table 13-2 GBE-C11 10/100/1000 BaseT Ethernet Pin Assignments

Item	Pin	1000BaseT	10/100BaseT
1	1	Bi-directional Data A+	Transmit +
	2	Bi-directional Data A-	Transmit -
	3	Bi-directional Data B+	Receive +
	4	Bi-directional Data C+	—
	5	Bi-directional Data C-	—
	6	Bi-directional Data B-	Receive -
	7	Bi-directional Data D+	—
8	8	Bi-directional Data D-	—

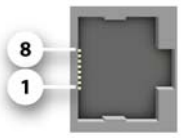


Figure 13-4 GBE-C11 10/100/1000 BaseT Ethernet Interface

13.3 GBE-C11 Module Types and Features

Each NetVX™ GBE-C11 module is factory-configured as a particular Module Type. Module Types are composed of a Module Base Type, such as “GBE-C11”, and a suffix, such as “PRO-M”. The Module Type indicates which premium features are present on the module. Table 13-3 below identifies each GBE-C11 Module Type. Examples of complete module names include: GBE-C11-LAN.

Table 13-3 GBE-C11 Module Type Definitions

Features	GBE-C11 Module Types and Feature Key Suffixes			
	GBE-C11-LAN	GBE-C11-LANTS	GBE-C11-VIPA	GBE-C11-FX*
Video on IP (VIP) — Support for VC function types: TS_TX, TS_RX, RTP_TX, or RTP_RX				
VC 16 — Support for up to sixteen virtual channels.				
VC 127 — Support for up to one hundred and twenty seven virtual channels.				
IPoTS — Support for IP on Transport Stream				

Legend	
Supported Feature	
Unsupported Feature	

* GBE-C11-FX is the ordering code for this key. Modules utilizing this feature key may self-identify themselves as ‘GBE-C11-STD’.

Identically keyed ‘Module Types’ are required for the following purposes.

- Application module redundancy requires identically keyed main and backup module types. It is possible to use modules with different feature keys provided that (a) All application-specific features are provided by the backup module, and (b) The backup module is configured to its base type. This subject is discussed in greater detail in the Videm™ Element Management System help topics, “How to Configure a Backup Module”, and “Overview of Backup Module Compatibility”.
- Like ‘Module Types’ are required on modules in any two slots between which profiles may be copied.

13.4 GBE-C11 Parts List

Table 13-4 lists GBE-C11 Gigabit Ethernet Interface Module-related part numbers and descriptions.

Table 13-4 GBE-C11 Gigabit Ethernet Network Interface Module Parts List

Part	Description		
See Table 13-3 GBE-C11 Module Type Definitions on page 100 above for details regarding the following keys.			
GBE-C11-LAN	Gigabit Ethernet Network Interface Module Feature Key		
GBE-C11-LANTS	Gigabit Ethernet Network Interface Module Feature Key		
GBE-C11-VIPA	Gigabit Ethernet Network Interface Module Feature Key		
GBE-C11-STD	Gigabit Ethernet Network Interface Module		
Harris Part Number	**Description**	**ManufacturerPart Number**	
GBE-OPT-SM	Single-Mode SFP Module	Stratos Lightwave	SPLC-20-4D-2M-B
GBE-OPT-MM	Multi-Mode SFP Module	Stratos Lightwave	SPLC-20-4-1-B

13.5 GBE-C11 Specifications

Interface Specifications

Electrical Interface General

Type	10/100/1000 Base-T Auto Select
Standard	IEEE 802.3
Connector	RJ-45
Operating Modes	Full Duplex, Half Duplex

Electrical Interface 1000BaseT

Differential Output Voltage	0.75 V ±0.83 dB
High Frequency Jitter (max)	0.3 ns
Clock Frequency	125 MHz ±0.01%
Common Mode Rejection	1V RMS 1–250 MHz

Gigabit Ethernet Optical Network Interfaces

SFP Interface: Gigabit Ethernet (GigE) Single-Mode Laser

Manufacturer	Stratos Lightwave
Part Number	SPLC-20-4D-2M-B
Connector Type	LC
Output Power (min.)	-9.5 dBm
Output Power (max.)	-3 dBm
Output Center Wavelength	1285 nm–1335 nm; 1310 nm (typical)
Input Power (min.)	-20 dBm
Input Power (max.)	-3 dBm
Optical Input Wavelength	1270 nm–1610 nm
Line Rate	1.25/1.0625 Gbaud
Laser Mode	Single-Mode, 1310 nm FP Laser (10km)
Voltage	+3.3 Volt
Ejector	Bail Actuator
Operating Case Temp	0º to +70ºC
Applicable Standards	IEEE 802.3z 1000 Base LX Specification for Optical Links

SFP Interface: Gigabit Ethernet (GigE) Multi-Mode Laser

Manufacturer	Stratos Lightwave
Part Number	SPLC-20-4-1-B
Connector Type	LC
Output Power (min.)	-9.5 dBm
Output Power (max.)	-2 dBm
Output Center Wavelength	830 nm–860 nm; 850 nm (typical)
Input Power (min.)	-17 dBm
Input Power (max.)	0 dBm
Optical Input Wavelength	770 nm–860 nm
Line Rate	1.25/1.0625 Gbaud
Laser Mode	Multi-Mode, 850 nm VCSEL
Voltage	+3.3 Volt
Ejector	Bail Actuator
Operating Case Temp	-5° to +80°C
Applicable Standards	IEEE 802.3z 1000 Base SX Specification for Optical Links

MPEG Specifications

General

IP Encapsulation	UDP or RTP
FEC type	XOR
Maximum Number of IP VCs Using FEC High	63
Maximum Number of IP VCs Using FEC Medium, Low, or None	127
Block Size	1–16 Packets
Interleaver Depth	1–20
MTU Size	1–7 Transport Stream Packets

De-Multiplexing

Programs	63 Programs
Sustained Throughput	450 Mbps
Network Jitter Tolerance	30 ms
PCR Accuracy	325 ns

Multiplexing

Programs/PIDs Supported	63 Programs
Sustained Throughput	450 Mbps

Bandwidth

See Chapter 26: NetVX™ Bandwidth on page 455 for details.

Physical Specifications

GBE-C11 Module

Height	100 mm	
Width	20 mm	
Depth	160 mm	
Weight	0.3 kg	(0.6 lbs)

Electrical Specifications

Power Consumption	9 W

*** All specifications are subject to change without notice ***

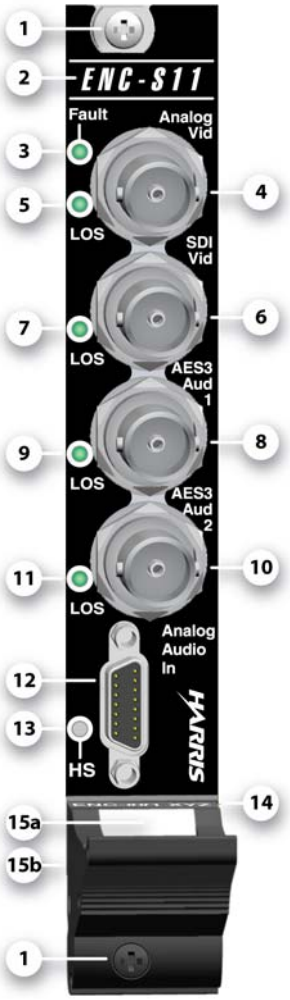
Chapter 14: ENC-S11

Standard Definition MPEG-2 Encoder Module

14

14.1 Overview

The NetVX™'s ENC-S11 module is a single-program MPEG-2 encoder. The ENC-S11 modules accepts analog composite and SMPTE 259M SDI component video. Some keyed versions of the module also encode VANC and VBI data present in the video input see Section 14.6, "ENC-S11 Specifications" on page 109 for details. See Table 14-6 for a list of supported features.



The ENC-S11 encodes two stereo pairs of audio using AC-3 or MPEG-1 Level 2 compression and can also process lossless SMPTE 302 audio. Primary and secondary stereo audio input is accepted as AES3, balanced analog, or embedded audio.

Table 14-1 ENC-S11 Faceplate

#	Label/Description	Function
1	Posidriv captive fasteners	Secures the module in the NetVX™ chassis.
2	Module Identification	Identifies module type and model.
3	Tri-color fault LED	Indicates board state. **Off** Module not powered. **Green** Module is active and no faults are detected. **Amber** Module is booting, offline, or running diagnostics. **Red** Module has detected a hardware fault and should be replaced.
4	Analog Vid	Composite analog video input.
5, 7, 9,11	Tri-color line status LEDs	Indicates state of adjacent input signal. **Off** Not configured for use. **Green** Input signal is present and error-free. **Amber** Input signal is present with errors. **Red** Loss of signal or loss of framing.
6	SDI Vid	SMPTE 259M Serial Digital Interface (SDI) input.
8	AES3 Aud 1	Primary AES3 Digital Audio Input.
10	AES3 Aud 2	Secondary AES3 Digital Audio Input.
12	Analog Audio In	Provides balanced Primary and Secondary Audio in.
13	Hot Swap Ejection Indicator LED	**Off** Module is not ready to be removed from the enclosure. **Blue** Module is ready to be removed from the backplane.
14	Module Model Number	Identifies the module model.
15a	Ejector Release Button	Unlocks the ejector/Injector handle to allow the module to eject.
15b	Injector/Ejector Handle	Disengages the module from the backplane.

Figure 14-1 NetVX™ ENC-S11 Faceplate

The ENC-S11 is 100 mm high by 20 mm wide. Captive Posidriv fasteners at the top and at bottom of the faceplate secure the module in the NetVX™ enclosure. A injector/ejector handle at the bottom of the faceplate engages and disengages the circuit board from the enclosure.

14.2 Electrical Interfaces

14.2.1 Digital Video

The “SDI Vid” connector accepts 525-line or 625-line component SMPTE 259M serial digital component video signals on a 75 Ω BNC jack. The input is internally terminated at 75 Ω.

14.2.2 Analog Video

The “Analog Vid” connector accepts NTSC, NTSC-J, PAL-I, B, G, H, D or PAL-M composite input on a 75 Ω BNC jack. The input is internally terminated at 75 Ω.

14.2.3 Digital Audio

The “AES3 Aud1” and “AES3 Aud2” each accept SMPTE-276M digital audio input through a 75 Ω BNC jack. The connection labeled “AES3 Aud1” provides the Primary Audio channel, and the connection labeled and “AES3 Aud2” provides the secondary audio channel.

14.2.4 Primary and Secondary Balanced Audio

The “Analog Audio In” connection provides stereo inputs for both the primary and the secondary audio channel on a 15-pin male D-subminiature interface. Two cable assemblies are available for this connection. Please See Section 14.3, "Analog Audio Cable" on page 105 for details.

If a custom cable is required, a connector kit can be ordered from ITT Cannon (http://www.ittcannon.com). A mating connector kit (part number MDSM-15SC-Z11-VS1) includes insulator, shield, hood and jackscrews. A set of female crimp contacts (part number MDS-S-TS) is also required for the mating connector.

Please refer to Table 14-2 below for proper wiring configuration. Shielded, twisted pair cable should be used.

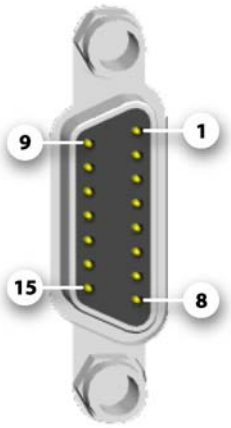


Figure 14-2 15-Pin D-Subminiature Connector

Table 14-2 ENC-S11 Balanced Analog Audio Connection Pin Assignments

Item	Pin	Signal	Signal Voltage Level
1	1	Primary Audio: Left-Channel Negative	+24 dBm Max.
	2	Primary Audio: Left-Channel Positive	
	3	Primary Audio: Right-Channel Negative	+24 dBm Max.
	4	Primary Audio: Right-Channel Positive	
	5	Secondary Audio: Left-Channel Negative	+24 dBm Max.
	6	Secondary Audio: Left-Channel Positive	
	7	Secondary Audio: Right-Channel Negative	+24 dBm Max.
8	8	Secondary Audio: Right-Channel Positive	
9	9	Ground (Pins 9-15)	Not Applicable
	10		
	11		
	12		
	13		
	14		
15	15		

The cable shield should be connected to a GND terminal and the two inner conductors to the (+) and (-) connections. The (+) and (-) polarities must be wired correctly for proper operation.

Note: It is possible to receive input from unbalanced audio devices (such as most consumer amplifiers and TV monitors) by connecting the negative to ground and turning off attenuation in software. Use the cfg slot.s/enc.m/aud.n inlvl command to set attenuation to -10 dBu for use with consumer equipment.

The balanced audio inputs are normally left un-terminated with an input impedance >10K Ohms. They can be terminated with a 600 Ohm resistive load by installing the jumpers at the location shown in Figure 14-3, "Analog Audio Input Jumper Positions" on page 105.

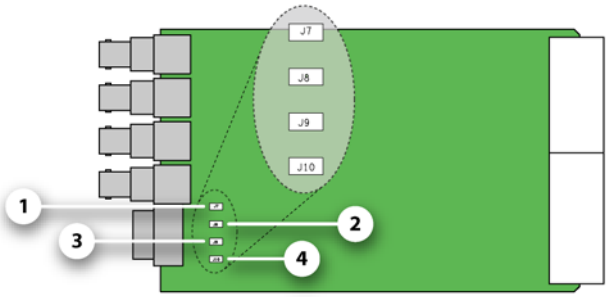


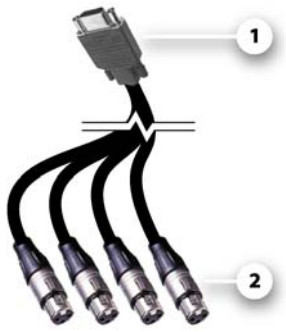
Figure 14-3 Analog Audio Input Jumper Positions

Table 14-3 ENC-S11 Balanced Audio Termination Jumper Settings

Item	Audio Channel	Jumper	Jumper Present	Jumper Not Present (Default setting "as shipped")
1	Primary Audio Left	J7	600 Ohm Resistive Load	>10K Ohms Impedance
2	Primary Audio Right	J8		
3	Secondary Audio Left	J9		
4	Secondary Audio Right	J10		

14.3 Analog Audio Cable

14.3.1 AAC-1MF Audio Cable



The AAC-1MF Audio Cable is designed for use with these modules. The cable is one meter long and is terminated on one end with a D-subminiature 15-pin connector. The opposite ends are terminated with four female XLR connectors. Labels on each XLR identify the signal.

Table 14-4 AAC-1MF Audio Cable Connectors

#	Connector Type
1	1 – Female D-Subminiature 15-Pin Connector. See Table 14-2 ENC-S11 Balanced Analog Audio Connection Pin Assignments on page 104 for pinout.
2	4 – Female XLR Connectors. See Table 14-5 AAC-1MF Audio Cable: Female XLR Signal Pinout on page 106 below for pinout.

Figure 14-4 AAC-1MF Audio Cable

Figure 14-5 identifies the female XLR pin assignments.

Table 14-5 AAC-1MF Audio Cable: Female XLR Signal Pinout

Connector	Pin	Signal
Audio (XLR)	1	GND
	2	Positive (+)
	3	Negative (-)

Figure 14-5 AAC-1MF Audio Cable: Female XLR Pin Assignments

Note: There are conflicting industry practices concerning signal polarity. Refer to the manual of the connecting piece of equipment for signal polarity and specifications.

14.3.2 AAC-3ML Audio Cable

This cable is designed for use with the NetVX™'s encoding and decoding modules. This cable is three meters long and is terminated on one end with a female D-subminiature 15-pin connector. The opposing ends are labeled and un-terminated.

14.4 Encoder Module Types and Features

Each NetVX™ encoding module is factory-configured as a particular Module Type. Module Types are composed of a Module Base Type, such as "ENC-S11", and a suffix, such as "PRO-M". The Module Type indicates which premium features are present on the module. Table 14-6 below identifies each encoder Module Type. An example of a complete module name is: ENC-S11-UTIL-M.

Table 14-6 ENC-S11 Module Type Definitions

Features	ENC-S11 Module Types										
Features	ENC-S11-UTIL-M	ENC-S11-STD-M	ENC-S11-STD-MC	ENC-S11-STD-D	ENC-S11-STD-DC	ENC-S11-PRO-M	ENC-S11-PRO-D	ENC-S11-PRO-DM	ENC-S11-PRO-MC	ENC-S11-PRO-DC	ENC-S11-PRO-DMC
4:2:0 MPEG-2 Video Encoding (MP@ML)											
4:2:2 Professional Profile with Extended Window											
Analog Video and Balanced Audio Interfaces											
MPEG Layer 2 Audio (Musicam)											
Dolby AC-3 2.0 Audio											
One Stereo Pair of Audio											
Two Stereo Pairs of Audio											
SDI Video and AES Audio Interfaces											
Fixed-Key Scrambling											
SMPTE 302M Audio Encapsulation											
VBI Extraction of Captions or Teletext, VBI Sampling, and Pass-Through Services											
ATSC Features											
DVB Features											

Table 14-6 ENC-S11 Module Type Definitions

Features	ENC-S11 Module Types
Legend	
Supported Feature	
Unsupported Feature	

Identically keyed ‘Module Types’ are required for the following purposes.

- Application module redundancy requires identically keyed main and backup module types. It is possible to use modules with different feature keys provided that (a) All application-specific features are provided by the backup module, and (b) The backup module is configured to its base type. This subject is discussed in greater detail in the Vidiem™ Element Management System help topics, “How to Configure a Backup Module”, and “Overview of Backup Module Compatibility”.
- Like ‘Module Types’ are required on modules in any two slots between which profiles may be copied.

14.5 ENC-S11 Parts List

Table 14-7 ENC-S11 MPEG-2 Encoder Module Parts List

Part	Description
ENC-S11	Base MPEG-2 Encoder Module

See Table 14-6 ENC-S11 Module Type Definitions on page 106 above for details regarding the following keys.

ENC-S11-UTIL-M	MPEG-2 Standard-Definition Encoder Module Feature Key
ENC-S11-STD-M	MPEG-2 Standard-Definition Encoder Module Feature Key
ENC-S11-STD-MC	MPEG-2 Standard-Definition Encoder Module Feature Key
ENC-S11-STD-D	MPEG-2 Standard-Definition Encoder Module Feature Key
ENC-S11-STD-DC	MPEG-2 Standard-Definition Encoder Module Feature Key
ENC-S11-PRO-M	MPEG-2 Standard-Definition Encoder Module Feature Key
ENC-S11-PRO-D	MPEG-2 Standard-Definition Encoder Module Feature Key
ENC-S11-PRO-DM	MPEG-2 Standard-Definition Encoder Module Feature Key
ENC-S11-PRO-MC	MPEG-2 Standard-Definition Encoder Module Feature Key
ENC-S11-PRO-DC	MPEG-2 Standard-Definition Encoder Module Feature Key
ENC-S11-PRO-DMC	MPEG-2 Standard-Definition Encoder Module Feature Key

Part	Description
AAC-1MF	Audio cable with 15-pin D-subminiature connector and four female XLR connectors.
AAC-3ML	Audio cable with 15-pin D-subminiature connector and wire leads.

14.6 ENC-S11 Specifications

ENC-S11 Video Specifications

Analog Video Input Formats

Analog Composite Formats	NTSC, NTSC-J, PAL-I, B, G, H, D or PAL-M

Digital Video Input

Formats	SDI (ANSI/SMPTE 259M-1997)
Jitter Tolerance	Meets SMPTE RP184 specifications
Rate	270 Mbps
Sampling	8-bit or 10-bit
Connector	75-Ohm BNC

VBI Input Formats	**VBI Standard**	**MPEG Carriage Standard**
Closed Captions	EIA608	EIA708 and ETSI EN 301 775
Vertical Interval Time Code	SMPTE12M/SMPTE266	MISO/IEC 13818-1 (GOP Header)
WST Teletext	ETSI EN 300 706	ETSI EN 301 775 and ETSI EN 300 472
Wide Screen Signaling	ETSI EN 300 294	ETSI EN 301 775
Lossless Luma (6 Lines Max.)	—	ETSI EN 301 775
Pre-Stored Test Patterns	Various	Proprietary

ENC-S11 Audio Specifications

Embedded Audio

Format	SMPTE 272M

Digital Audio Input

Format	AES (AES3-1992, ANSI S4.40-1992), SMPTE-276M
Sampling	24-bits at 48 KHz, 20-bits at 48 Khz, 16-bits at 48 Khz
Connectors	75-Ohm BNC

Analog Audio* Input

Impedance	Balanced (600 Ohm)
Input Level	+4 dBu with 20dBu headroom
Connector	15-pin D-sub connector

Bandwidth

See Chapter 26: NetVX™ Bandwidth on page 455 for details.

ENC-S11to DEC-S11 End-to-End Analog NTSC Video Performance

Parameter Name	Test Signal	Units	Value
*Insertion Gain Variation	NTC-7 Composite	±IRE	0.15
Sync Amplitude	NTC-7 Composite	40 ±IRE	0.5
Burst Amplitude	NTC-7 Composite	40 ±IRE	0.5
Line Time Waveform Distortion	NTC-7 Composite	< %	1
Field Time Waveform Distortion	NTC-7 Composite	< %	0.2
2T Pulse to Bar Ratio (PB-Ratio)	NTC-7 Composite	100 ±%	3
2T Pulse Shape (K-2T)	NTC-7 Composite	< %	0.5
T Step Overshoot (K-PB)	NTC-7 Composite	< %	0.5
Chrominance – Luminance Gain Inequality	NTC-7 Composite	100 ±%	2
Chrominance – Luminance Delay Inequality	NTC-7 Composite	±ns	10
Chrominance – Luminance Intermodulation	NTC-7 Composite	< %	0.5
Luminance Non Linearity	NTC-7 Composite	< %	2
Chrominance Gain Non-Linearity	NTC-7 Combination	< %	2
Chrominance Phase Non-Linearity	NTC-7 Combination	< Deg	1
Differential Gain	NTC-7 Composite	< %	1
Differential Phase	NTC-7 Composite	< Deg	1.3
Signal to Noise Ratio (15kHz – 4.2MHz, Unified weighting)	50% Flat Field	dB	54
Signal to Noise Ratio (15kHz – 4.2MHz, Unified weighting)	Shallow Ramp	dB	54
Multiburst 0.5 MHz	NTC-7 Combination	±dB	0.2
Multiburst 1.0 MHz	NTC-7 Combination	±dB	0.4
Multiburst 2.0 MHz	NTC-7 Combination	±dB	0.5
Multiburst 3.0 MHz	NTC-7 Combination	±dB	0.5
Multiburst 3.5 MHz	NTC-7 Combination	±dB	0.4
Multiburst 4.2 MHz	NTC-7 Combination	±dB	0.45
Group Delay	Sine X/X	< ns	30
Group Delay Gain	Sine X/X	< dB	1

ENC-S11 to DEC-S11 End-to-End Analog PAL Video Performance

Test Parameter	Signal	Units	Value
Insertion Gain Variation	NTC-7 Composite	±mV	0.15
Sync Amplitude	NTC-7 Composite	280 ±mV	7
Burst Amplitude	NTC-7 Composite	280 ±mV	7
Line Time Waveform Distortion	NTC-7 Composite	< %	1
Field Time Waveform Distortion	NTC-7 Composite	< %	0.2
2T Pulse to Bar Ratio (PB-Ratio)	NTC-7 Composite	100 ±%	3
2T Pulse Shape (K-2T)	NTC-7 Composite	< %	0.5
T Step Overshoot (K-PB)	NTC-7 Composite	< %	0.5
Chrominance – Luminance Gain Inequality	NTC-7 Composite	100 ±%	4
Chrominance – Luminance Delay Inequality	NTC-7 Composite	±ns	10
Chrominance – Luminance Intermodulation	NTC-7 Composite	< %	0.5
Luminance Non Linearity	NTC-7 Composite	< %	2
Chrominance Phase Non-Linearity	NTC-7 Combination	< Deg	1
Differential Gain	NTC-7 Composite	< %	2
Differential Phase	NTC-7 Composite	< Deg	1.3
Signal to Noise Ratio (15kHz – 4.2MHz, Unified weighting)	50% Flat Field	dB	54
Signal to Noise Ratio (15kHz – 4.2MHz, Unified weighting)	Shallow Ramp	dB	54
Multiburst 0.5 MHz	NTC-7 Combination	±dB	0.2
Multiburst 1.0 MHz	NTC-7 Combination	±dB	0.4
Multiburst 2.0 MHz	NTC-7 Combination	±dB	0.5
Multiburst 4.0 MHz	NTC-7 Combination	±dB	0.6
Multiburst 4.8 MHz	NTC-7 Combination	±dB	0.6
Multiburst 5.8 MHz	NTC-7 Combination	±dB	3

ENC-S11 to DEC-S11 End-to-End Digital Video Performance

Test Parameter	NTSC/PAL Test Signal	Value
Electrical Specifications		
Output Impedance	(75/100)% Colorbars	> 15 dB return loss @ 75-Ohms
Amplitude	(75/100)% Colorbars	800 mV p-p ±10%
Rise Time	(75/100)% Colorbars	0.4 nSec.–1.5nSec.
Fall Time	(75/100)% Colorbars	0.4 nSec.–1.5nSec.
Rise Overshoot	(75/100)% Colorbars	<10%
Fall Overshoot	(75/100)% Colorbars	<10%
DC Offset	(75/100)% Colorbars	±0.5V
Jitter		
Timing Jitter 10Hz–1kHz	(75/100)% Colorbars	0.2 UI p-p
Alignment Jitter 1kHz–27MHz	(75/100)% Colorbars	0.2 UI p-p
Wander (60 sec. After acquisition):		
Drift Rate (below.5 Hz)	(75/100)% Colorbars	150 ppb/sec.
Component Signal Accuracy and Timing Vectors		
Pb Gain	(75/100)% Colorbars	1.00%
Pr Gain	(75/100)% Colorbars	1.00%
Luma Gain	(75/100)% Colorbars	1.00%
Interchannel Delay (Pb – Y)	(75/100)% Colorbars	NGT 10 nSec.
Interchannel Delay (Pr – Y)	(75/100)% Colorbars	NGT 10 nSec.
Format Monitor & Ancillary Data over 8 Hours		
Loss of SDI Signal	(75/100)% Colorbars	O Count
Active Video Line Length	(75/100)% Colorbars	O Count
Horizontal Blanking Length	(75/100)% Colorbars	O Count
Field Length Errors	(75/100)% Colorbars	O Count
Ancillary Data Errors	(75/100)% Colorbars	O Count
Ancillary Audio Errors	(75/100)% Colorbars	O Count
Luminance Error Low	(75/100)% Colorbars	O Count
Luminance Error High	(75/100)% Colorbars	O Count
Chrominance Error Low	(75/100)% Colorbars	O Count
Chrominance Error High	(75/100)% Colorbars	O Count
Miscellaneous XY (Z) Error	(75/100)% Colorbars	O Count
Errored Seconds	(75/100)% Colorbars	O Count
FIFO Overflow Errors	(75/100)% Colorbars	O Count

ENC-S11 to DEC-S11 End-to-End Analog Audio Performance

Test Parameter	Test Signal	Units Value
Nominal Bandwidth		20.0 Hz to 20.0 kHz
Insertion Gain	0 dBm 400Hz Sine	0.0 ±1.0 dB
Gain-Frequency Response (Relative to 0 dBm @ 1 kHz)		
20–100 Hz	-20 dBm sweep	±0.5 dB
100–7.5kHz	-20 dBm sweep	±0.5 dB
7.5kHz–16kHz	-20 dBm sweep	±0.5 dB
16kHz–20kHz	-20 dBm sweep	±2 dB
Total Harmonic Distortion *		
(+4 dBm @ 400 Hz)	Sine	-60 dB
(+4 dBm @ 1 kHz)	Sine	-60 dB
* There is a 10dB noise spike at 3 kHz. This affects SNR and Phase at 3 kHz.		
Headroom (Above 0 dBm @ 1 kHz until 1% distortion)		NLT 24.0 dB
Signal to Noise Ratio		
Unweighted 20 kHz Flat	0 dBm 400 Hz Sine	NLT 60.0 dB
Weighted CCIR 468-2 RMS	0 dBm 400 Hz Sine	NLT 65.0 dB
Crosstalk	0 dBm 20-20 kHz Sweep	NGT -56.0 dB
Level Difference (20 Hz–20 kHz)		NGT ±0.25 dB
Phase Difference (20 Hz–20 kHz)		NGT 1.0 Deg

ENC-S11 General Specifications

Systems Multiplex

Jitter Tolerance	< 1 ms of multiplex jitter; < 500ns PCR jitter
Format	MPEG-2 Transport Stream
PSI formats	ISO (IEC 13818.1 MPEG-2 Systems)
Encryption	BISS-E (EBU Tech 3292 rev. 2)

Multiplexed Program Bit Rates

Maximum Transport Stream Bit Rate	58 Mbps
ENC-S11 Video Bit Rate (4:2:2 Profile)	Up to 50 Mbps
ENC-S11 Video Bit Rate (MP@ML)	Up to 15 Mbps
Audio Bit Rate	Up to 3.1 Mbps per service (2 Stereo Pairs max allowed)

ENC-S11 Physical Specifications

ENC-S11 Encoder Module

Height	100 mm	
Width	20 mm	
Depth	160 mm	
Weight	0.3 kg	(0.6 lbs)

ENC-S11 Electrical Specifications

ENC-S11 Power Consumption	17 W

*** All specifications are subject to change without notice. ***

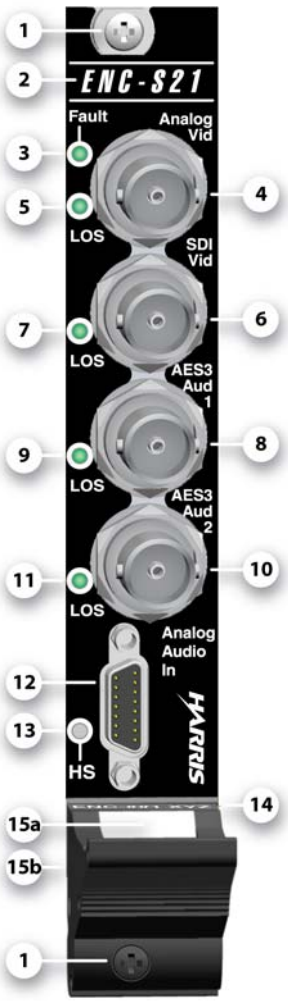
Chapter 15: ENC-S21

Standard Definition MPEG-2 Encoder Module

15

15.1 Overview

The NetVX™'s ENC-S21 module is a single-program MPEG-2 encoder. The ENC-S21 encodes Main Level/Main Profile 4:2:0. The ENC-S21 accepts both analog composite and SMPTE 259M SDI component video.



The ENC-S21 encodes 2 stereo pairs of audio using AC-3 or MPEG-1 Level 2 compression, or the lossless SMPTE 302 audio format. Primary and secondary stereo audio input is accepted as AES3, balanced analog, or embedded. The ENC-S21 also encodes VANC and VBI data present in the video input see Section 15.6, "ENC-S21 Specifications" on page 119 for details.

Table 15-1 ENC-S21 Faceplate

#	Label/Description	Function
1	Posidriv captive fasteners	Secures the module in the NetVX™ chassis.
2	Module Identification	Identifies module type and model.
3	Tri-Color Fault LED	Indicates board state. **Off** Module not powered. **Green** Module is active and no faults are detected. **Amber** Module is booting, offline, or running diagnostics. **Red** Module has detected a hardware fault and should be replaced.
4	Analog Vid	Composite analog video input.
5, 7, 9,11	Tri-Color Line Status LEDs	Indicates state of adjacent input signal. **Off** Not configured for use. **Green** Input signal is present and error-free. **Amber** Input signal is present with errors. **Red** Loss of signal or loss of framing.
6	SDI Vid	SMPTE 259M Serial Digital Interface (SDI) input.
8	AES3 Aud 1	Primary AES3 Digital Audio Input.
10	AES3 Aud 2	Secondary AES3 Digital Audio Input.
12	Analog Audio In	Provides balanced Primary and Secondary Audio in.
13	Hot Swap Ejection Indicator LED	**Off** Module is not ready to be removed from the enclosure. **Blue** Module is ready to be removed from the backplane.
14	Module Model Number	Identifies the module model.
15a	Ejector Release Button	Unlocks the ejector/Injector handle to allow the module to eject.
15b	Injector/Ejector Handle	Disengages the module from the backplane.

Figure 15-1 NetVX™ ENC-S21 Faceplate

The ENC-S21 is 100 mm high by 20 mm wide. Captive Posidriv fasteners at the top and at bottom of the faceplate secure the module in the NetVX™ enclosure. A injector/ejector handle at the bottom of the faceplate engages and disengages the circuit board from the enclosure.

15.2 Electrical Interfaces

15.2.1 Digital Video

The “SDI Vid” connector accepts 525-line or 625-line component SMPTE 259M serial digital component video signals on a 75 Ω BNC jack. The input is internally terminated at 75 Ω.

15.2.2 Analog Video

The “Analog Vid” connector accepts NTSC, NTSC-J, PAL-I, B, G, H, D or PAL-M composite input on a 75 Ω BNC jack. The input is internally terminated at 75 Ω.

15.2.3 Digital Audio

The “AES3 Aud1” and “AES3 Aud2” each accept SMPTE-276M digital audio input through a 75 Ω BNC jack. The connection labeled “AES3 Aud1” provides the Primary Audio channel, and the connection labeled and “AES3 Aud2” provides the secondary audio channel.

15.2.4 Primary and Secondary Balanced Audio

The “Analog Audio In” connection provides stereo inputs for both the primary and the secondary audio channel on a 15-pin male D-subminiature interface. Two cable assemblies are available for this connection. Please See Section 15.3, "ENC-S21 Analog Audio Cable" on page 116 for details.

If a custom cable is required, a connector kit can be ordered from ITT Cannon (http://www.ittcannon.com). A mating connector kit (part number MDSM-15SC-Z11-VS1) includes insulator, shield, hood and jackscrews. A set of female crimp contacts (part number MDS-S-TS) is also required for the mating connector.

Please refer to Table 15-2 below for proper wiring configuration. Shielded, twisted pair cable should be used.

Table 15-2 ENC-S21 Balanced Analog Audio Connection Pin Assignments

Item	Pin	Signal	Signal Voltage Level
1	1	Primary Audio: Left-Channel Negative	+24 dBm Max.
	2	Primary Audio: Left-Channel Positive	
	3	Primary Audio: Right-Channel Negative	+24 dBm Max.
	4	Primary Audio: Right-Channel Positive	
	5	Secondary Audio: Left-Channel Negative	+24 dBm Max.
	6	Secondary Audio: Left-Channel Positive	
	7	Secondary Audio: Right-Channel Negative	+24 dBm Max.
8	8	Secondary Audio: Right-Channel Positive	
9	9	Ground (pins 9-15)	Not Applicable
	10		
	11		
	12		
	13		
	14		
15	15		

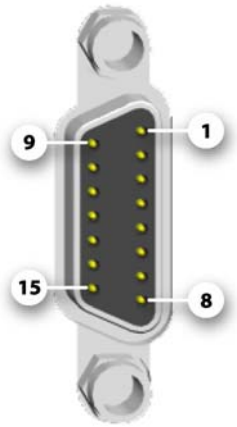


Figure 15-2 ENC-S21 15-Pin D-Subminiature Connector

The cable shield should be connected to a GND terminal and the two inner conductors to the (+) and (-) connections. The positive and negative polarities must be wired correctly for proper operation.

Note: It is possible to receive input from unbalanced audio devices (such as most consumer amplifiers and TV monitors) by connecting the negative to ground and turning off attenuation in software.
Use the cfg slot.s/enc.m/aud.n inlvl command to set attenuation to -10 dBu for use with consumer equipment.

The balanced audio inputs are normally left un-terminated with an input impedance >10K Ohms. They can be terminated with a 600 Ohm resistive load by installing the jumpers at the location shown in Figure 15-3, "ENC-S21 Analog Audio Input Jumper Positions" on page 116.

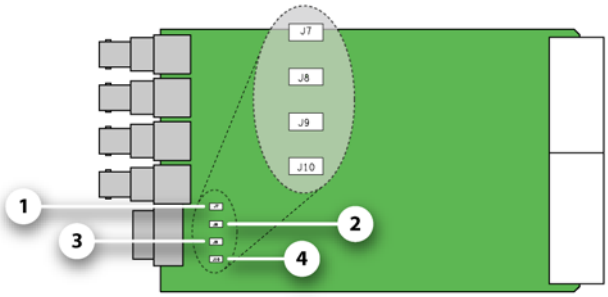


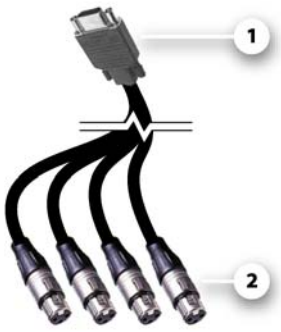
Figure 15-3 ENC-S21 Analog Audio Input Jumper Positions

Table 15-3 ENC-S21 Balanced Audio Termination Jumper Settings

Item	Audio Channel	Jumper	Jumper Present	Jumper Not Present (Default setting "as shipped")
1	Primary Audio Left	J7	600 Ohm Resistive Load	>10K Ohms Impedance
2	Primary Audio Right	J8		
3	Secondary Audio Left	J9		
4	Secondary Audio Right	J10		

15.3 ENC-S21 Analog Audio Cable

15.3.1 AAC-1MF Audio Cable



The AAC-1MF Audio Cable is designed for use with the ENC-S21 module. The cable is one meter long and is terminated on one end with a D-subminiature 15-pin connector. The opposite ends are terminated with four female XLR connectors. Labels on each XLR identify the signal.

Table 15-4 AAC-1MF Audio Cable Connectors

#	Connector Type
1	1 – Female D-Subminiature 15-Pin Connector. See Table 15-2 ENC-S21 Balanced Analog Audio Connection Pin Assignments on page 115 for pinout.
2	4 – Female XLR Connectors. See Table 15-5 AAC-1MF Audio Cable: Female XLR Signal Pinout on page 116 below for pinout.

Figure 15-4 AAC-1MF Audio Cable

Figure 15-5 identifies the female XLR pin assignments.

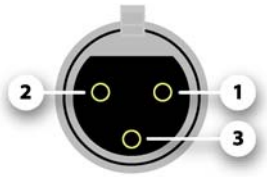


Table 15-5 AAC-1MF Audio Cable: Female XLR Signal Pinout

Connector	Pin	Signal
Audio (XLR)	1	GND
	2	Positive (+)
	3	Negative (-)

Figure 15-5 AAC-1MF Audio Cable: Female XLR Pin Assignments

Note: There are conflicting industry practices concerning signal polarity. Refer to the manual of the connecting piece of equipment for signal polarity and specifications.

15.3.2 AAC-3ML Audio Cable

This cable is designed for use with both the ENC-S21 module, and the DEC-S11 module. This cable is three meters long and is terminated on one end with a female D-subminiature 15-pin connector. The opposing ends are labeled and unterminated.

15.4 Encoder Module Types and Features

Each NetVX™ encoding module is factory-configured as a particular Module Type. Module Types are composed of a Module Base Type, such as “ENC-S21”, and a suffix, such as “PRO-M”. The Module Type indicates which premium features are present on the module. Table 15-6 below identifies each encoder Module Type.

Table 15-6 ENC-S21 Module Type Definitions

Features	ENC-S21 Module Types		
	ENC-S21-STD-M	ENC-S21-STD-D	ENC-S21-STD-DM
MPEG-2 Video Encoding			
Analog Video and Balanced Audio Interfaces			
MPEG Layer 2 Audio (Musicam)			
Dolby AC-3 2.0 Audio			
One Stereo Pair of Audio			
Two Stereo Pairs of Audio			
SDI Video and AES Audio Interfaces			
VBI Extraction of Captions or Teletext, VBI Sampling, and Pass-Through Services			
ATSC Features			
DVB Features			

Legend	
Supported Feature	
Unsupported Feature	

Identical Module Types are required for the following purposes.

- Application module redundancy requires identically keyed main and backup module types. It is possible to use modules with different feature keys provided that (a) All application-specific features are provided by the backup module, and (b) The backup module is configured to its base type. This subject is discussed in greater detail in the Vidiem™ Element Management System help topics, “How to Configure a Backup Module”, and “Overview of Backup Module Compatibility”.
- Like Module Types are required on modules in any two slots between which Profiles may be copied.

Note: Two NetVX™ slots must be allotted for each ENC-S21. The slot to the right of the module (slot n-1) must be left empty.

15.5 ENC-S21 Parts List

Table 15-7 lists ENC-S21 MPEG-2 Encoder Module-related part numbers and descriptions.

Table 15-7 ENC-S21 MPEG-2 Encoder Module Parts List

Part	Description
ENC-S21	Base MPEG-2 Standard-Definition Encoder Module.
See Table 15-6 ENC-S21 Module Type Definitions on page 117 above for details regarding the following keys.	
ENC-S21-STD-M	MPEG-2 Standard-Definition Encoder Module Feature Key
ENC-S21-STD-D	MPEG-2 Standard-Definition Encoder Module Feature Key
ENC-S21-STD-DM	MPEG-2 Standard-Definition Encoder Module Feature Key

Part	Description
AAC-1MF	Audio cable with 15-pin D-subminiature connector and four female XLR connectors.
AAC-3ML	Audio cable with 15-pin D-subminiature connector and wire leads.

15.6 ENC-S21 Specifications

Video Specifications

Analog Video Input Formats

Analog Composite Formats	NTSC, NTSC-J, PAL-I, B, G, H, D or PAL-M

Digital Video Input

Formats	SDI (ANSI/SMPTE 259M-1997)
Jitter Tolerance	Meets SMPTE RP184 specifications
Rate	270 Mbps
Sampling	8-bit or 10-bit 4:2:2 component
Connector	75-Ohm BNC

VBI Input Formats	**VBI Standard**	**MPEG Carriage Standard**
Closed Captions	EIA608	EIA708 and ETSI EN 301 775
Vertical Interval Time Code	SMPTE12M/SMPTE266	MISO/IEC 13818-1 (GOP Header)
WST Teletext	ETSI EN 300 706	ETSI EN 301 775 and ETSI EN 300 472
Wide Screen Signaling	ETSI EN 300 294	ETSI EN 301 775
Lossless Luma (2 Lines Max.)	—	ETSI EN 301 775
Pre-Stored Test Patterns	Various	Proprietary

Audio Specifications

Embedded Audio

Format	SMPTE 272M

Digital Audio Input

Format	AES (AES3-1992, ANSI S4.40-1992), SMPTE-276M
Sampling	24-bits at 48 KHz, 20-bits at 48 Khz, 16-bits at 48 Khz
Connectors	75-Ohm BNC

Analog Audio* Input

Impedance	Balanced (600 Ohm)
Input Level	+4 dBu with 20 dBu headroom
Connector	15-pin D-sub connector

Bandwidth

See Chapter 26: NetVX™ Bandwidth on page 455 for details.

ENC-S21 to DEC-S11 End-to-End Analog NTSC Video Performance

Parameter Name	**Test Signal**	**Units**	**Value**
*Insertion Gain Variation	NTC-7 Composite	±IRE	0.15
Sync Amplitude	NTC-7 Composite	40 ±IRE	0.5
Burst Amplitude	NTC-7 Composite	40 ±IRE	0.5
Line Time Waveform Distortion	NTC-7 Composite	< %	1
Field Time Waveform Distortion	NTC-7 Composite	< %	0.2
2T Pulse to Bar Ratio (PB-Ratio)	NTC-7 Composite	100 ±%	3
2T Pulse Shape (K-2T)	NTC-7 Composite	< %	0.5
T Step Overshoot (K-PB)	NTC-7 Composite	< %	0.5
Chrominance – Luminance Gain Inequality	NTC-7 Composite	100 ±%	2
Chrominance – Luminance Delay Inequality	NTC-7 Composite	±ns	10
Chrominance – Luminance Intermodulation	NTC-7 Composite	< %	0.5
Luminance Non Linearity	NTC-7 Composite	< %	2
Chrominance Gain Non-Linearity	NTC-7 Combination	< %	2
Chrominance Phase Non-Linearity	NTC-7 Combination	< Deg	1
Differential Gain	NTC-7 Composite	< %	1
Differential Phase	NTC-7 Composite	< Deg	1.3
Signal to Noise Ratio (15kHz – 4.2MHz, Unified weighting)	50% Flat Field	dB	54
Signal to Noise Ratio (15kHz – 4.2MHz, Unified weighting)	Shallow Ramp	dB	54
Multiburst 0.5 MHz	NTC-7 Combination	±dB	0.2
Multiburst 1 MHz	NTC-7 Combination	±dB	0.4
Multiburst 2 MHz	NTC-7 Combination	±dB	0.5
Multiburst 3 MHz	NTC-7 Combination	±dB	0.5
Multiburst 3.5 MHz	NTC-7 Combination	±dB	0.4
Multiburst 4.2 MHz	NTC-7 Combination	±dB	0.45
Group Delay	Sine X/X	< ns	30
Group Delay Gain	Sine X/X	< dB	1

ENC-S21 to DEC-S11 End-to-End Analog PAL Video Performance

Test Parameter	Signal	Units	Value
Insertion Gain Variation	NTC-7 Composite	±mV	0.15
Sync Amplitude	NTC-7 Composite	280 ±mV	7
Burst Amplitude	NTC-7 Composite	280 ±mV	7
Line Time Waveform Distortion	NTC-7 Composite	< %	1
Field Time Waveform Distortion	NTC-7 Composite	< %	0.2
2T Pulse to Bar Ratio (PB-Ratio)	NTC-7 Composite	100 ±%	3
2T Pulse Shape (K-2T)	NTC-7 Composite	< %	0.5
T Step Overshoot (K-PB)	NTC-7 Composite	< %	0.5
Chrominance – Luminance Gain Inequality	NTC-7 Composite	100 ±%	4
Chrominance – Luminance Delay Inequality	NTC-7 Composite	±ns	10
Chrominance – Luminance Intermodulation	NTC-7 Composite	< %	0.5
Luminance Non Linearity	NTC-7 Composite	< %	2
Chrominance Phase Non-Linearity	NTC-7 Combination	< Deg	1
Differential Gain	NTC-7 Composite	< %	2
Differential Phase	NTC-7 Composite	< Deg	1.3
Signal to Noise Ratio (15kHz – 4.2MHz, Unified weighting)	50% Flat Field	dB	54
Signal to Noise Ratio (15kHz – 4.2MHz, Unified weighting)	Shallow Ramp	dB	54
Multiburst 0.5 MHz	NTC-7 Combination	±dB	0.2
Multiburst 1.0 MHz	NTC-7 Combination	±dB	0.4
Multiburst 2.0 MHz	NTC-7 Combination	±dB	0.5
Multiburst 4.0 MHz	NTC-7 Combination	±dB	0.6
Multiburst 4.8 MHz	NTC-7 Combination	±dB	0.6
Multiburst 5.8 MHz	NTC-7 Combination	±dB	3

ENC-S21 to DEC-S11 End-to-End Digital Video Performance

Test Parameter	NTSC/PAL Test Signal	Value
Electrical Specifications		
Output Impedance	(75/100)% Colorbars	> 15 dB return loss @ 75-Ohms
Amplitude	(75/100)% Colorbars	800 mV p-p ±10%
Rise Time	(75/100)% Colorbars	0.4 nSec. – 1.5nSec.
Fall Time	(75/100)% Colorbars	0.4 nSec. – 1.5nSec.
Rise Overshoot	(75/100)% Colorbars	<10%
Fall Overshoot	(75/100)% Colorbars	<10%
DC Offset	(75/100)% Colorbars	±0.5V
Jitter		
Timing Jitter 10Hz – 1kHz	(75/100)% Colorbars	0.2 UI p-p
Alignment Jitter 1kHz – 27MHz	(75/100)% Colorbars	0.2 UI p-p
Wander (60 sec. After acquisition):		
Drift Rate (below.5 Hz)	(75/100)% Colorbars	150 ppb/sec.
Component Signal Accuracy and Timing Vectors		
Pb Gain	(75/100)% Colorbars	1.00%
Pr Gain	(75/100)% Colorbars	1.00%
Luma Gain	(75/100)% Colorbars	1.00%
Interchannel Delay (Pb – Y)	(75/100)% Colorbars	NGT 10nSec.
Interchannel Delay (Pr – Y)	(75/100)% Colorbars	NGT 10nSec.
Format Monitor & Ancillary Data over 8 Hours		
Loss of SDI Signal	(75/100)% Colorbars	O Count
Active Video Line Length	(75/100)% Colorbars	O Count
Horizontal Blanking Length	(75/100)% Colorbars	O Count
Field Length Errors	(75/100)% Colorbars	O Count
Ancillary Data Errors	(75/100)% Colorbars	O Count
Ancillary Audio Errors	(75/100)% Colorbars	O Count
Luminance Error Low	(75/100)% Colorbars	O Count
Luminance Error High	(75/100)% Colorbars	O Count
Chrominance Error Low	(75/100)% Colorbars	O Count
Chrominance Error High	(75/100)% Colorbars	O Count
Miscellaneous XY (Z) Error	(75/100)% Colorbars	O Count
Errored Seconds	(75/100)% Colorbars	O Count
FIFO Overflow Errors	(75/100)% Colorbars	O Count

ENC-S21 to DEC-S11 End-to-End Analog Audio Performance

Test Parameter	Test Signal	Units	Value
Nominal Bandwidth		20.0 Hz to 20.0 kHz	
Insertion Gain	0 dBm 400Hz Sine	0.0 ±1.0 dB	
Gain-Frequency Response (Relative to 0 dBm @ 1 kHz)			
20–100 Hz	-20 dBm sweep	+0.5 to -0.5 dB	
100–7.5kHz	-20 dBm sweep	+0.5 to -0.5 dB	
7.5kHz–16kHz	-20 dBm sweep	+0.5 to -0.5 dB	
16kHz–20kHz	-20 dBm sweep	+2 to -2 dB	
Total Harmonic Distortion *			
(+4 dBm @ 400 Hz)	Sine	-60dB	
(+4 dBm @ 1 kHz)	Sine	-60dB	
* There is a 10dB noise spike at 3kHz. This affects SNR and Phase at 3kHz.			
Headroom (Above 0 dBm @ 1 kHz until 1% distortion)		NLT 24.0 dB	
Signal to Noise Ratio			
Unweighted 20 kHz Flat	0 dBm 400Hz Sine	NLT 60.0 dB	
Weighted CCIR 468-2 RMS	0 dBm 400Hz Sine	NLT 65.0 dB	
Crosstalk	0 dBm 20-20kHz Sweep	NGT -56.0 dB	
Level Difference (20 Hz – 20 kHz)		NGT ±0.25 dB	
Phase Difference (20 Hz – 20 kHz)		NGT 1.0 Deg	

General Specifications

Systems Multiplex

Jitter Tolerance	< 1 ms of multiplex jitter; < 500ns PCR jitter
Format	MPEG-2 Transport Stream
PSI Formats	ISO (IEC 13818.1 MPEG-2 Systems)
Encryption	BISS-E (EBU Tech 3292 rev. 2)

Multiplexed Program Bit Rates

Maximum Transport Stream Bit Rate	18 Mbps
Video Bit Rate	Up to 15 Mbps
Audio Bit Rate	Up to 3.1 Mbps per service (2 stereo pairs max allowed)

Physical Specifications

ENC-S21 Encoder Module

Height	100 mm	
Width	20 mm	
Depth	160 mm	
Weight	0.3 kg	(0.6 lbs)

Electrical Specifications

ENC-S21 Power Consumption	23 W

*** All specifications are subject to change without notice. ***

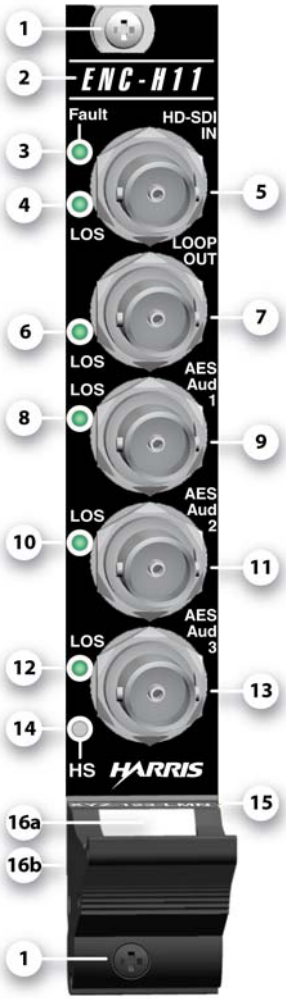
Chapter 16: ENC-H11

High-Definition MPEG-2 Encoder Module

16

16.1 Overview

The NetVX™ ENC-H11 is a single-program MPEG-2 HDTV encoder. The ENC-H11 encodes SMPTE 292M (HD) or SMPTE 259M (SD) video into MPEG-2 4:2:2 Profile at High Level and Main Profile at High Level. The module provides three AES audio input interfaces.



The ENC-H11 encodes up to 2 stereo pairs of audio using either AC-3 or MPEG-1 Level 2 compression, plus a third pair using the lossless SMPTE 302 audio format. Each stereo audio input is accepted as either embedded AES3 audio or via separate unbalanced AES-3 input. The ENC-H11 also encodes VANC and VBI data present in the video input see Section 16.5, "ENC-H11 Specifications" on page 126 for details.

Table 16-1 ENC-H11 Faceplate

#	Label/Description	Function
1	Posidriv captive fasteners	Secures the module in the NetVX™ chassis.
2	Module Identification	Identifies module type and model.
3	Tri-Color Fault LED	Indicates board state. **Off** Module not powered. **Green** Module is active and no faults are detected. **Amber** Module is booting, offline, or running diagnostics. **Red** Module has detected a hardware fault and should be replaced.
4 , 6, 8, 10, 12	Tri-Color Line Status LEDs	Indicates state of adjacent input signal. **Off** Not configured for use. **Green** Input signal is present and error-free. **Amber** Input signal is present with errors. **Red** Loss of signal or loss of framing.
5	HD-SDI Video Input	SMPTE 292M High-Definition Serial Digital Interface (HD-SDI) input. -OR- SMPTE 259M Standard-Definition Serial Digital Interface (SDI) input. Note: SD-SDI is not upconverted but treated as standard-definition.
7	HD-SDI Video Output	Re-clocked HD-SDI loop-through output.
9	AES3 Aud 1	AES3 Digital Audio Input.
11	AES3 Aud 2	AES3 Digital Audio Input.
13	AES3 Aud 3	AES3 Digital Audio Input.
14	Hot Swap Ejection Indicator LED	**Off** Module is not ready to be removed from the enclosure. **Blue** Module is ready to be removed from the backplane.
15	Module Model Number	Identifies the module model.
16a	Ejector Release Button	Unlocks the ejector/Injector handle to allow the module to eject.
16b	Injector/Ejector Handle	Disengages the module from the backplane.

Figure 16-1 NetVX™ ENC-H11 Faceplate

The ENC-H11 is 100 mm high by 20 mm wide. Captive Posidriv fasteners at the top and at bottom of the faceplate secure the module in the NetVX™ enclosure. A injector/ejector handle at the bottom of the faceplate engages and disengages the circuit board from the enclosure.

16.2 Electrical Interfaces

16.2.1 Digital Video

The “HD-SDI In” connection receives either high-definition SMPTE 292M or standard-definition SMPTE 259M SDI serial digital component video signals through a 75 Ω BNC jack. The input is internally terminated at 75 Ω.

Note: The ENC-H11 does not upconvert standard-definition SMPTE 259M SDI input. Rather, the SD signal is encoded as SD.

16.2.2 Digital Video Loop Through

The “HD-SDI Out” connection provides a re-clocked HD-SDI loop through output.

16.2.3 Digital Audio

The “AES3 Aud (1–3)” connectors each accept SMPTE-276M digital audio input through a 75 Ω BNC jack. The connection labeled “AES3 Aud1” provides the primary audio channel, and the connection labeled and “AES3 Aud2” provides the secondary audio channel.

16.3 Encoder Module Types and Feature

Each NetVX™ encoding module is factory-configured as a particular Module Type. Module Types are composed of a Module Base Type, such as “ENC-H11”, and a suffix, such as “PRO-M”. The Module Type indicates which premium features are present on the module. Table 16-2 below identifies each encoder Module Type.

Table 16-2 ENC-H11 Module Type Definitions

Features	ENC-H11 Module Types												
	ENC-H11-STD-M	ENC-H11-STD-D	ENC-H11-DVBT	ENC-H11-ATSC	ENC-H11-PRO-M	ENC-H11-PRO-D	ENC-H11-PRO-DM	ENC-H11-PRO-MC	ENC-H11-PRO-DC	ENC-H11-PRO-DMC	ENC-H11-SD-M	ENC-H11-SD-D	ENC-H11-SD-DM
4:2:0 MPEG-2 Video Encoding (MP@HL)													
4:2:0 MPEG-2 Video Encoding (MP@ML)													
4:2:2 Professional Profile with Extended Window													
MPEG Layer 2 Audio (Musicam)													
Dolby AC-3 2.0 Audio													
Two Stereo Pairs of Audio													
SDI Video and AES Audio Interfaces													
Fixed-Key Scrambling (BISS)													
SMPTE 302M Audio Encapsulation													
VANC Extraction of Captions													
Vertical Ancillary Data Support													
ATSC Features													
DVB Features													

Table 16-2 ENC-H11 Module Type Definitions

Features	ENC-H11 Module Types												
	ENC-H11-STD-M	ENC-H11-STD-D	ENC-H11-DVBT	ENC-H11-ATSC	ENC-H11-PRO-M	ENC-H11-PRO-D	ENC-H11-PRO-DM	ENC-H11-PRO-MC	ENC-H11-PRO-DC	ENC-H11-PRO-DMC	ENC-H11-SD-M	ENC-H11-SD-D	ENC-H11-SD-DM

Legend	
Supported Feature	
Unsupported Feature	

Identical Module Types are required for the following purposes.

- Application module redundancy requires identically keyed main and backup module types. It is possible to use modules with different feature keys provided that (a) All application-specific features are provided by the backup module, and (b) The backup module is configured to its base type. This subject is discussed in greater detail in the Vidiem™ Element Management System help topics, “How to Configure a Backup Module”, and “Overview of Backup Module Compatibility”.
- Like Module Types are required on modules in any two slots between which Profiles may be copied.

16.4 ENC-H11 Parts List

Table 16-3 lists ENC-H11 MPEG-2 Encoder Module-related part numbers and descriptions.

Table 16-3 ENC-H11 MPEG-2 Encoder Module Parts List

Part	Description
ENC-H11	Base MPEG-2 High-Definition Encoder Module.
See Table 16-2 ENC-H11 Module Type Definitions on page 124 for details of the following keys.	
ENC-H11-STD-M	MPEG-2 High-Definition Encoder Module Feature Key
ENC-H11-STD-D	MPEG-2 High-Definition Encoder Module Feature Key
ENC-H11-DVBT	MPEG-2 High-Definition Encoder Module Feature Key
ENC-H11-ATSC	MPEG-2 High-Definition Encoder Module Feature Key
ENC-H11-PRO-M	MPEG-2 High-Definition Encoder Module Feature Key
ENC-H11-PRO-D	MPEG-2 High-Definition Encoder Module Feature Key
ENC-H11-PRO-DM	MPEG-2 High-Definition Encoder Module Feature Key
ENC-H11-PRO-MC	MPEG-2 High-Definition Encoder Module Feature Key
ENC-H11-PRO-DC	MPEG-2 High-Definition Encoder Module Feature Key
ENC-H11-PRO-DMC	MPEG-2 High-Definition Encoder Module Feature Key

16.5 ENC-H11 Specifications

Video Specifications

High-Definition Digital Video Input

Source Formats	SMPTE 292M-1998, Table 1 column E
Samples x Lines	1920x1080
Frame Rate	30/1.001 Hz
Color Encoding	$Y'C_B'C_R'$ (SMPTE RP177)
Source Formats	SMPTE 292M-1998, Table 1 column F
Samples x Lines	1920x1080
Frame Rate	25 Hz
Color Encoding	$Y'C_B'C_R'$
Source Formats	SMPTE 292M-1998, Table 1 column M
Samples x Lines	1280x720
Frame Rate	60/1.001 Hz
Color Encoding	$Y'C_B'C_R'$ (SMPTE RP177)

Standard-Definition Digital Video Input

Formats	SDI (ANSI/SMPTE 259M-1997)
Jitter Tolerance	Meets SMPTE RP184 specifications
Rate	270 Mbps
Sampling	8-bit or 10-bit
Connector	75-Ohm BNC
Physical Interface	75-Ohm BNC
Precision	10-Bit

Compression Mode

Formats	MPEG-2 4:2:2 Profile at High Level MPEG Main Profile at High Level

Audio Specifications

Embedded Audio

Format	SMPTE 272M

Digital Audio Inputs

Format	AES (AES3-1992, ANSI S4.40-1992), SMPTE-276M
Sampling	Synchronized to video and re-sampled to 48 KHz at 24-bits
Connectors	75 Ohm BNC

General Specifications

Systems Multiplex

Jitter Tolerance	Within SMPTE 292M specifications
Format	MPEG-2 Transport Stream, Digital Video Broadcast (DVB), ATSC
PSI formats	ISO (IEC 13818.1 MPEG-2 Systems)

Bandwidth

See Chapter 26: NetVX™ Bandwidth on page 455 for details.

Physical Specifications

ENC-H11 Encoder Module

Height	100 mm	
Width	20 mm	
Depth	160 mm	
Weight	0.35 kg	0.78 lb.

Electrical Specifications

ENC-H11 Power Consumption	29 W

*** All specifications are subject to change without notice. ***

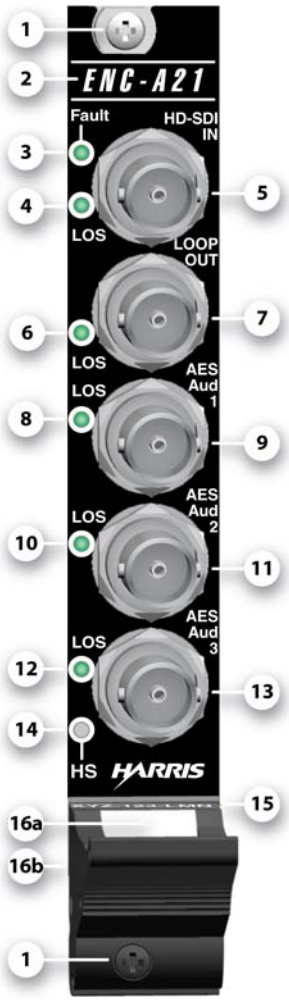
Chapter 17: ENC-A21

HD/SD MPEG-4 Part 10/H.264 Encoder Module

17

17.1 Overview

NetVX™ ENC-A21 module encodes either standard-definition (SMPTE-259M) or high-definition (SMPTE-292M) video signals as MPEG-4 Part 10/H.264. Using this module, the NetVX™ can provide up to eight identical real-time MPEG-4 Part 10/H.264 Part 10 encoded streams from a single input source.



The ENC-A21's internal video and audio codecs are software-keyed, board-level features. Each module's software key distinguishes it as either an ENC-A21-HD (high-definition) MPEG-4 Part 10/H.264 Main Profile Level 4 video encoding module, or as an ENC-A21-SD (standard-definition) MPEG-4 Part 10/H.264 Main Profile Level 3 video encoding module. The ENC-A21 encodes VANC (HD) data present in the video input it receives.

Table 17-1 ENC-A21 Faceplate

#	Label/Description	Function
1	Posidriv captive fasteners	Secures the module in the NetVX™ chassis.
2	Module Identification	Identifies module type and model.
3	Tri-Color Fault LED	Indicates board state. **Off** Module not powered. **Green** Module is active and no faults are detected. **Amber** Module is booting, offline, or running diagnostics. **Red** Module has detected a hardware fault and should be replaced.
4, 6, 8, 10, 12	Tri-Color Line Status LEDs	Indicates state of adjacent input signal. **Off** Not configured for use. **Green** Input signal is present and error-free. **Amber** Input signal is present with errors. **Red** Loss of signal or loss of framing.
5	HD-SDI Video Input	SMPTE 292M High Definition Serial Digital Interface (HD-SDI) input.
7	HD-SDI Video Output	Re-clocked HD-SDI loop-through output.
9	AES3 Aud 1	AES3 Digital Audio Input.
11	AES3 Aud 2	AES3 Digital Audio Input.
13	AES3 Aud 3	AES3 Digital Audio Input.
14	Hot Swap Ejection Indicator LED	**Off** Module is not ready to be removed from the enclosure. **Blue** Module is ready to be removed from the backplane.
15	Module Model Number	Identifies the module model.
16a	Ejector Release Button	Unlocks the ejector/Injector handle to allow the module to eject.
16b	Injector/Ejector Handle	Disengages the module from the backplane.

Figure 17-1 NetVX™ ENC-A21 Faceplate

The ENC-A21 features three AES3 stereo audio inputs and it can dissemble and encode audio embedded in the incoming SDI signal. Every ENC-A21 encodes up to two (2) stereo pair of audio using AAC-LE or HE-AAC. Additional feature keys can activate either Dolby AC-3 or MPEG-1 Level 2 (Musicam) compression. The module also supports audio input in the lossless SMPTE-302M audio format.

The ENC-A21 is 100 mm high by 20 mm wide. Captive Posidriv fasteners at the top and at bottom of the faceplate secure the module in the NetVX™ enclosure. A injector/ejector handle at the bottom of the faceplate engages and disengages the circuit board from the enclosure.

17.2 Electrical Interfaces

17.2.1 Digital Video

High Definition Video Input

The “HD-SDI In” connection receives SMPTE 292M serial digital component video signals through a 75 Ω BNC jack. The input is internally terminated at 75 Ω.

Standard Definition Video Input

The “SDI Vid” connector accepts 525-line or 625-line component SMPTE 259M serial digital component video signals on a 75 Ω BNC jack. The input is internally terminated at 75 Ω.

17.2.2 Digital Audio

The “AES3 Aud (1–3)” connectors each accept SMPTE-276M digital audio input through a 75 Ω BNC jack. The encoder maps audio received on these interfaces into the encoded program’s audio channels one through three respectively.

17.3 Encoder Module Types and Feature

Each NetVX™ encoding module is factory-configured as a particular Module Type. Module Types are composed of a Module Base Type, such as “ENC-A21-SD”, or “ENC-A21-HD” and a suffix, such as “DP”. The Module Type indicates which premium features are present on the module. Table 17-2 below identifies each encoder Module Type.

Table 17-2 ENC-A21 Module Type Definitions

Features	ENC-A21 Module Types										
	ENC-A21-SD ENC-A21-HD	ENC-A21-SD-M ENC-A21-HD-M	ENC-A21-SD-D ENC-A21-HD-D	ENC-A21-SD-P ENC-A21-HD-P	ENC-A21-SD-MP ENC-A21-HD-MP	ENC-A21-SD-DP ENC-A21-HD-DP	ENC-A21-SD-MBL	ENC-A21-SD-MC ENC-A21-HD-MC	ENC-A21-SD-DC ENC-A21-HD-DC	ENC-A21-SD-DM ENC-A21-HD-DM	ENC-A21-SD-DMC ENC-A21-HD-DMC
MPEG-4 H.264 Video Encoding Level 1, 1.2, 1.3 (Base-Line)											
MPEG-4 Part 10/H.264 Video Encoding Level 3 (SD), Level 4.1 (HD)											
MPEG Layer 2 Audio (Musicam) — Three Pairs											
Dolby AC-3 2.0 Audio — Three Pairs											
MPEG-4 AAC-LC Audio 2.0 (Low Complexity) — Two Pairs											
MPEG-4 HE-AAC Audio 2.0 (High Efficiency) — Two Pairs											
MPEG-4 AAC-LC 5.1											
MPEG-4 HE-AAC 5.1											
Fixed-Key Scrambling (BISS-1 and E)											
SMPTE 302M Audio Encapsulation (Rate Permitting)											
VBI Extraction of SD Captions	*	*	*	*	*	*	*	*	*	*	*
VANC Extraction of Captions	**	**	**	**	**	**		**	**	**	**
Vertical Ancillary Data Support	**	**	**	**	**	**		**	**	**	**
PIP Low-Resolution Secondary Stream											

Legend	
Supported Feature on All Models	
Supported Feature on SD Models Only	*
Supported Feature on HD Models Only	**
Unsupported Feature	

Identical Module Types are required for the following purposes.

- Application module redundancy requires identically keyed main and backup module types. It is possible to use modules with different feature keys provided that (a) All application-specific features are provided by the backup module, and (b) The backup module is configured to its base type. This subject is discussed in greater detail in the Vidiem™ Element Management System help topics, “How to Configure a Backup Module”, and “Overview of Backup Module Compatibility”.
- Like Module Types are required on modules in any two slots between which Profiles may be copied.

Note: Two NetVX™ slots must be allotted for each ENC-A21. The slot to the right of the module (slot n-1) must be left empty.

17.4 ENC-A21 Parts List

Table 17-3 ENC-A21 MPEG-4 Part 10/H.264 Encoder Module Parts List

Part	Description
ENC-A21	Base MPEG-4 Part 10/H.264 HD/SD Encoder Module

See Table 17-2 ENC-A21 Module Type Definitions on page 130 above for details regarding the following keys.

MPEG-4 Part 10/H.264 High-Definition Encoders	
ENC-A21-HD	MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key
ENC-A21-HD-M	MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key
ENC-A21-HD-D	MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key
ENC-A21-HD-P	MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key
ENC-A21-HD-MP	MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key
ENC-A21-HD-DP	MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key
ENC-A21-HD-MC	MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key
ENC-A21-HD-DC	MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key
ENC-A21-HD-DM	MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key
ENC-A21-HD-DMC	MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key
MPEG-4 Part 10/H.264 Standard-Definition Encoders	
ENC-A21-SD	MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key
ENC-A21-SD-M	MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key
ENC-A21-SD-D	MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key
ENC-A21-SD-P	MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key
ENC-A21-SD-MP	MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key
ENC-A21-SD-DP	MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key
ENC-A21-SD-MBL	MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key
ENC-A21-SD-MC	MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key
ENC-A21-SD-DC	MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key
ENC-A21-SD-DM	MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key
ENC-A21-SD-DMC	MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key

17.5 ENC-A21 Specifications

ENC-A21 Video Specifications

HD-SDI High-Definition Digital Video Input Formats	Samples x Lines @ Rate	Standard
1080i30	1920x1080 @ 30/1.001 Hz	SMPTE 292M-1998, Table 1 Column E
1080i25	1920x1080 @ 25 Hz	SMPTE 292M-1998, Table 1 Column F
720p59.94	1280x720 @ 59.94 Hz	SMPTE 292M-1998, Table 1 Row 2
720p50	1280x720 @ 50 Hz	SMPTE 296M-2001, Table 1 Row 3
Input Line Rate(s)	1.485 Gb/s and 1.485/1.001	

SDI Standard-Definition Digital Video Input Formats	
480, 525-Line Resolutions	720x480, 720x525
Formats	ANSI/SMPTE 259M-C 1997
Input Line Rate	270 Mbps

Physical Interface	
Output Jitter	Meets SMPTE RP184 Specifications
Sampling	8-bit or 10-bit
Connectors	75 Ohm BNC

Video Compression	
Standard	H.264/ISO-IEC-14496-10 2005
Profile and Level	Supports Main Profile at Level 4.0-compatible decoders
Horizontal Resolutions	720, 1080, 1440, 1920
Anchor Frames	2
Macro Block Processing	In-Loop De-blocking
Two (2) Processor Multi-Pass Encoding	Hardware: Two (2) Processor Implementation in current board. Software: (Available in a future release)
Coding	CABAC, CAVLC
Compressed Output (to backplane) Bitrates	1.0–20.0 Mbps
Low-Resolution Secondary Stream (LRSS) Resolutions	96x96 pixels for 4/3 aspect ratio inputs. 128x96 for 16/9 aspect ratio inputs.

VBI Input Formats	VBI Standard	MPEG Carriage Standard
Closed Captions	EIA608	EIA708 and ETSI EN 301 775
Vertical Interval Time Code	SMPTE12M/SMPTE266M	ISO/IEC 13818-1 (GOP Header)
WST Teletext	ETSI EN 300 706	ETSI EN 301 775 and ETSI EN 300 472
Wide Screen Signaling	ETSI EN 300 294	ETSI EN 301 775
Lossless Luma (6 Lines Max.)	—	ETSI EN 301 775
Pre-Stored Test Patterns	Various	Proprietary
Key, Length, Value (KLV) Encoding Format	SMPTE 336M-2007	

ENC-A21 Audio Specifications

Embedded Audio	
SD Format	SMPTE 272M
HD Format	SMPTE 299M

Digital Audio Input	
Format	AES (AES3-1992, ANSI S4.40-1992), SMPTE-276M
Sampling	Synchronized to video and re-sampled to 48 KHz at 24-bits
Connectors	75 Ohm BNC

Audio Compression and SMPTE 302 Audio Handling	
Audio Compression Standards	Dolby AC-3 2.0, MPEG-1 Layer 2, MPEG-4 AAC including SBR & PS, AAC-LC 2.0, HE-AAC 2.0, SMPTE 302M
Compressed Audio Bitrates	32–640 Kbps, and 2.8, 2.4, 2.0 Mbps (Standard-Dependent)

ENC-A21 General Specifications

Systems Multiplex	
Output Jitter	< 1 ms of multiplex jitter; < 500 ns PCR jitter
Format	MPEG-2 Transport Stream
PSI formats	ISO (IEC 13818.1 MPEG-2 Systems)
Encryption	BISS-1, BISS-E (EBU Tech 3292 rev. 2)
Ad Insertion/Splice Point signaling	SCTE 104/SCTE 35

Physical

Height ..... 100 mm
Width ..... 20 mm
Depth ..... 160 mm
Weight ..... 0.3 kg (0.6 lbs)
* The ENC-A21 module is not for use in the SYS-300 chassis.

Electrical

ENC-A21 Power Consumption ..... 35 W

*** All specifications are subject to change without notice. ***

Chapter 18: AUD-D14

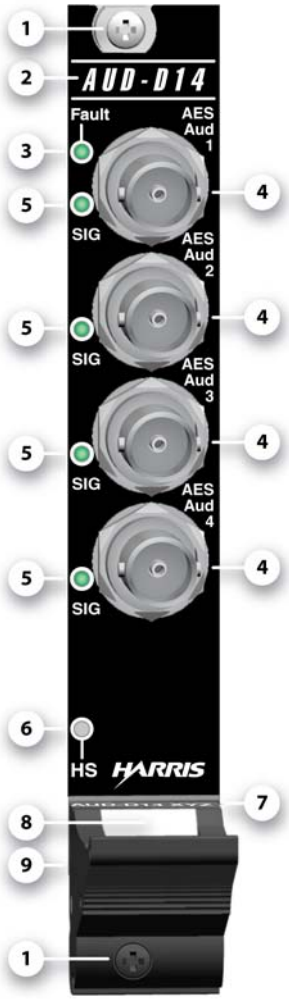
Four-Channel Audio Encoder and Decoder Module

18

18.1 Overview

The AUD-D14 Audio Processing Module extends the NetVX™'s audio capabilities by providing up to four additional channels of audio I/O. Audio codecs include MPEG-1 Layer 2 and Dolby AC-3™. SMPTE 302 is also provided to support lossless audio transmission or Dolby-E pass-through processing.

Each AUD-D14 audio channel operates in either 'associated' or 'stand-alone' mode. In 'associated' mode, one or more audio channels are associated with an MPEG-2 encoder or decoder to provide additional audio I/O facilities. In 'stand-alone' mode each AUD-D14 channel operates as an independent audio encoder or decoder.



For maximum flexibility, each of the AUD-D14's four interfaces can operate independently from one another. Additionally, multiple AUD-D14 modules can operate simultaneously in the same NetVX™ system.

Table 18-1 AUD-D14 Faceplate

#	Label/Description	Function
1	Posidriv Captive fasteners	Secures the module in the NetVX™ chassis.
2	Module Identification	Identifies module type and model.
3	Fault Tri-Color Status LED	Indicates board state. **Off** Module not powered. **Green** Module is active and no faults are detected. **Amber** Module is booting, offline, or running diagnostics. **Red** Module has detected a hardware fault and should be replaced.
4	AES Audio Inputs 1–4	AES3 Digital Audio Inputs/Outputs.
5	SIG Tri-Color Line Status LEDs	Indicates the state of adjacent digital audio input signal. **Off** Not configured for use. **Green** Input signal is present and error-free. **Amber** Input signal is present with errors. **Red** Loss of signal or loss of framing.
6	Hot Swap Ejection Indicator LED	**Off** Module is not ready to be removed from the enclosure. **Blue** Module is ready to be removed from the backplane.
7	Module Model Number	Identifies the actual model that the module is keyed to operate as.
8	Ejector Release Button	Unlocks the ejector/Injector handle to allow the module to eject.
9	Injector/Ejector Handle	Disengages the module from the backplane.

Figure 18-1 NetVX™ AUD-D14 Faceplate

The AUD-D14 is 100 mm high by 20 mm wide. Captive Posidriv fasteners at the top and at bottom of the faceplate secure the module in the NetVX™ enclosure. A injector/ejector handle at the bottom of the faceplate engages and disengages the circuit board from the enclosure.

18.2 Electrical Interface

18.2.1 Digital Audio

The “AES3 Aud (1–4)” interfaces each carry SMPTE-276M digital audio input and output through a 75 Ω BNC jack. Each interface can be associated with either an encoder or decoder program. Up to four audio channels can be associated with each program. The AUD-D14 can also operate in “stand alone mode”, whereby the channel creates it’s own, complete audio-only program.

18.3 AUD-D14 Module Types and Features

Each NetVX™ encoding module is factory-configured as a particular Module Type. Module Types are composed of a Module Base Type, such as “AUD-D14”, and a suffix, such as “STD-M”. The Module Type indicates which premium features are present on the module. Table 18-2 below identifies each encoder Module Type.

Table 18-2 AUD-D14 Module Type Definitions

Features	AUD-D14 Module Types			
	AUD-D14-DEC	AUD-D14-ENC-D	AUD-D14-ENC-M	AUD-D14-ENC-DM
Four Stereo Pairs of AES Digital Audio Interfaces				
MPEG Layer 2 Audio (Musicam) Encoding				
MPEG Layer 2 Audio (Musicam) Decoding				
Dolby AC-3 2.0 Audio Encoding				
Dolby AC-3 2.0 Audio Decoding				
SMPTE-302 Audio Processing				

Legend	
Supported Feature	
Unsupported Feature	

Identical Module Types are required for the following purposes.

- Application module redundancy requires identically keyed main and backup module types. It is possible to use modules with different feature keys provided that (a) All application-specific features are provided by the backup module, and (b) The backup module is configured to its base type. This subject is discussed in greater detail in the Vidiem™ Element Management System help topics, “How to Configure a Backup Module”, and “Overview of Backup Module Compatibility”.
- Like Module Types are required on modules in any two slots between which Profiles may be copied.

18.4 AUD-D14 Parts List

Table 18-3 lists AUD-D14 Four-Channel Audio Encoder Module-related part numbers and descriptions.

Table 18-3 AUD-D14 Four-Channel Audio Encoder/Decoder Module Parts List

Part	Description
AUD-D14	Base Four-Channel Audio Encoder/Decoder Module
See Table 18-2 AUD-D14 Module Type Definitions on page 136 above for details regarding the following keys.	
AUD-D14-DEC	Four-Channel Audio Encoder/Decoder Module Feature Key
AUD-D14-ENC-D	Four-Channel Audio Encoder/Decoder Module Feature Key
AUD-D14-ENC-M	Four-Channel Audio Encoder/Decoder Module Feature Key
AUD-D14-ENC-DM	Four-Channel Audio Encoder/Decoder Module Feature Key

18.5 AUD-D14 Specifications

Audio Specifications

Digital Audio Input

Format	AES (AES3-1992, ANSI S4.40-1992), SMPTE-276M
Sampling	24-bit at 48 KHz, 20-bit at 48 Khz, 16-bit at 48 Khz
Connectors	75 Ohm BNC

Audio Formats and Rate Ranges

Dolby Digital ™ AC-3 2.0	56–640 Kbps
MPEG-1 Layer 2, MPEG-2 Layer 1	96–384 Kbps
SMPTE 302M (Lossless and Dolby E-Compatible)	(Available in a future release)

General Specifications

System Multiplex

Multiplex Modes	ATSC, DVB
Jitter Tolerance	< 1 ms of multiplex jitter; < 500ns PCR jitter
Format	MPEG-2 Transport Stream
PSI Formats	ISO (IEC 13818.1 MPEG-2 Systems)
Encryption	BISS-E (EBU Tech 3292 rev. 2)

Physical Specifications

AUD-D14 Encoder Module

Height	100 mm	
Width	20 mm	
Depth	160 mm	
Weight	0.3 kg	(0.6 lbs)

Electrical Specifications

AUD-D14 Power Consumption	10 W

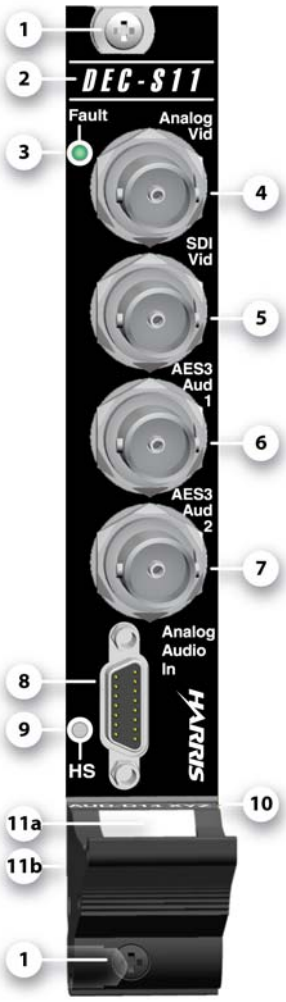
Chapter 19: DEC-S11

Standard-Definition MPEG-2 Decoder Module

19

19.1 Overview

The NetVX™ DEC-S11 is a single-program MPEG-2 decoder. The DEC-S11 decodes both Main Profile/Main Level 4:2:0 and Professional Profile/Main Level 4:2:2 video. The DEC-S11 provides both analog composite and SMPTE 259M SDI component video. The DEC-S11 decodes Dolby AC-3, MPEG-1 Layer 2, or SMPTE 302 audio. Primary and secondary stereo audio outputs are provided as AES3, balanced analog, or embedded audio. The DEC-S11 also inserts VANC and VBI data into the video output.



The DEC-S11 is 100 mm high by 20 mm wide. Captive Posidriv fasteners at the top and at bottom of the faceplate secure the module in the NetVX™ enclosure. A injector/ejector handle at the bottom of the faceplate engages and disengages the circuit board from the enclosure.

Table 19-1 DEC-S11 Faceplate

#	Label/Description	Function
1	Posidriv captive fasteners	Secures the module in the NetVX™ chassis.
2	Module Identification	Identifies module type and model.
3	Tri-state fault LED	Indicates board state. **Off** Module not powered. **Green** Module is active and no faults are detected. **Amber** Module is booting, offline, or running diagnostics. **Red** Module has detected a hardware fault and should be replaced.
4	Analog Vid	Provides analog video output.
5	SDI Vid *	Provides SMPTE 259M Serial Digital Interface (SDI) output.
6	AES Aud 1 *	Provides Primary AES3 Digital Audio Output
7	AES Aud 2 *	Provides Secondary AES3 Digital Audio Output
8	Analog Audio Out	Provides balanced Primary and Secondary Audio output.
9	Hot Swap Ejection Indicator LED	**Off** Module is not ready to be removed from the enclosure. **Blue** Module is ready to be removed from the backplane.
10	Module Model Number	Identifies the module model.
11a	Ejector Release Button	Unlocks the ejector/Injector handle to allow the module to eject.
11b	Injector/Ejector Handle	Disengages the module from the backplane.

Figure 19-1 NetVX™ DEC-S11 Faceplate

* Availability of this selection is determined by the module's feature profile.
See Table 19-5, "DEC-S11 Module Type Definitions" on page 142. See also util key.

19.2 Electrical Interfaces

19.2.1 Digital Video

The “SDI Vid” connector provides a 525 line or 625-line component SMPTE 259M serial digital component video output signal on a 75-Ohm BNC jack.

19.2.2 Analog Video

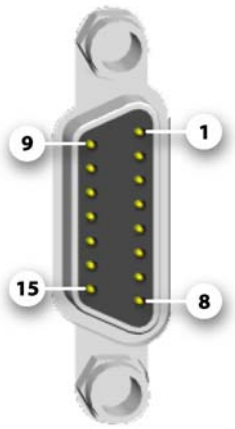
The “Analog Vid” connector provides NTSC, NTSC-J, PAL-I, B, G, H, D or PAL-M output on a 75 Ω BNC jack.

19.2.3 Digital Audio

The “AES3 Aud1” and “AES3 Aud2” each provide a SMPTE-276M digital audio interface on a 75-Ohm BNC jack. The connection labeled “AES3 Aud1” provides the primary audio program, and the connection labeled “AES3 Aud2” provides the secondary audio program.

19.2.4 Primary and Secondary Balanced Audio

The “Analog Audio Out” connection provides stereo outputs for both the primary and the secondary audio channel on a 15-pin male D-subminiature interface. Two cable assemblies are available for this connection. Please See Section 19.3, "DEC-S11 Analog Audio Cable" on page 141 for details.



If a custom cable is required, a connector kit can be ordered from ITT Cannon (http://www.ittcannon.com). A mating connector kit (part number MDSM-15SC-Z11-VS1) includes insulator, shield, hood and jackscrews. A set of female crimp contacts (part number MDS-S-TS) is also required for the mating connector.

Table 19-2 DEC-S11 Balanced Analog Audio Connection Pin Assignments

#	Pin	Signal
1	1	Primary Audio Program: Left-Channel Negative
	2	Primary Audio Program: Left-Channel Positive
	3	Primary Audio Program: Right-Channel Negative
	4	Primary Audio Program: Right-Channel Positive
	5	Secondary Audio Program: Left-Channel Negative
	6	Secondary Audio Program: Left-Channel Positive
	7	Secondary Audio Program: Right-Channel Negative
8	8	Secondary Audio Program: Right-Channel Positive
9	9	Ground (pins 9-15)
	10	
	11	
	12	
	13	
	14	
15	15	

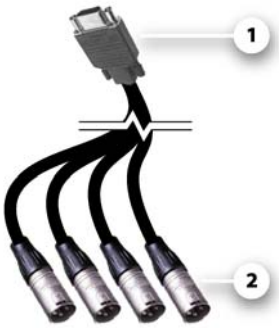
Figure 19-2 DEC-S11 15-Pin Male D-Subminiature Connector

Terminate the balanced audio (+) and (-) outputs with a 600-Ohm resistive load at the destination device for best results. Please refer to Table 19-2 below for proper wiring configuration. Shielded, twisted pair cable should be used. The cable shield should be connected to a GND terminal and the two inner conductors to the (+) and (-) connections for both the left and right channels. The (+) and (-) polarities must be wired correctly for proper operation.

- It is possible to drive unbalanced audio devices (such as most consumer amplifiers and TV monitors) by wiring the negative (-) to ground.
- Terminate the balanced audio (+) and (-) outputs with a 600-Ohm resistive load at the destination device for best results.

19.3 DEC-S11 Analog Audio Cable

19.3.1 AAC-1MM Audio Cable



The AAC-1MM Audio Cable is designed for use with the DEC-S11 module. The cable is one meter long and is terminated on one end with a D-subminiature 15-pin connector. The opposite ends are terminated with four male XLR connectors. Labels on each XLR identify the signal.

Table 19-3 AAC-1MM Audio Cable **Connectors**

#	Connector Type
1	1- Female D-Subminiature 15-Pin Connector. See Table 19-2, "DEC-S11 Balanced Analog Audio Connection Pin Assignments" on page 140 for pinout.
2	4 – Male XLR Connectors. See Table 19-4 AAC-1MM Audio Cable: Male XLR Signal Pinout on page 141 below for pinout.

Figure 19-3 AAC-1MM Audio Cable

Figure 19-4 identifies the male XLR pin assignments.

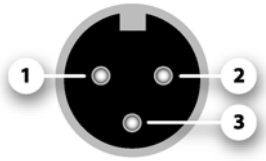


Table 19-4 AAC-1MM Audio Cable**: Male XLR Signal Pinout**

Connector	Pin	Signal
Audio (XLR)	1	GND
	2	Positive (+)
	3	Negative (-)

Figure 19-4 AAC-1MM Audio Cable**: Male XLR Pin Assignments**

Note: There are conflicting practices concerning XLR signal polarity. Refer to the manual of the connecting piece of equipment for signal polarity and specifications.

19.3.2 AAC-3ML Audio Cable

This cable is designed for use with both the ENC-S11 module, and the DEC-S11 module. This cable is three meters long and is terminated on one end with a female D-subminiature 15-pin connector. The opposing ends are labeled and unterminated.

19.4 Decoder Module Types and Features

Each NetVX™ decoding module is factory-configured as a particular Module Type. Module Types are composed of a Module Base Type, such as “DEC-S11”, and a suffix, such as “PRO-D”. The Module Type indicates which premium features are present on the module. Table 19-5 below identifies each decoder Module Type.

Table 19-5 DEC-S11 Module Type Definitions

Features	DEC-S11 Module Types			
	DEC-S11-STD	DEC-S11-STD-D	DEC-S11-PRO	DEC-S11-PRO-D
4:2:0 Video Decoding Capability				
4:2:2 Professional Profile with Extended Window				
Analog Video and Balanced Audio Interfaces				
MPEG Layer 2 Audio (Musicam)				
Dolby AC-3 2.0 Audio				
One Stereo Pair of Audio				
Two Stereo Pairs of Audio				
SDI Video and AES Audio Interfaces				
Fixed-Key Scrambling				
SMPTE-302 Audio Decoding				
Captions or Teletext Reconstruction, and VBI Sampling Reconstruction of Pass-Through Services				

Legend	
Supported Feature	
Unsupported Feature	

Identical Module Types are required for the following purposes.

- Application module redundancy requires identically keyed main and backup module types. It is possible to use modules with different feature keys provided that (a) All application-specific features are provided by the backup module, and (b) The backup module is configured to its base type. This subject is discussed in greater detail in the Vidiem™ Element Management System help topics, “How to Configure a Backup Module”, and “Overview of Backup Module Compatibility”.
- Like Module Types are required on modules in any two slots between which Profiles may be copied.

19.5 DEC-S11 Parts List

Table 19-6 DEC-S11 MPEG-2 Decoder Module Parts List

Part	Description
DEC-S11	Base MPEG-2 Standard Definition Decoder Module.
See Table 19-5 DEC-S11 Module Type Definitions on page 142 above for details regarding the following keys.	
DEC-S11-STD	MPEG-2 Standard-Definition Decoder Module Feature Key
DEC-S11-STD-D	MPEG-2 Standard-Definition Decoder Module Feature Key
DEC-S11-STD-PRO	MPEG-2 Standard-Definition Decoder Module Feature Key
DEC-S11-STD-PRO-D	MPEG-2 Standard-Definition Decoder Module Feature Key
Part	**Description**
AAC-1MM	Audio cable with 15-pin D-subminiature connector and four male XLR connectors.
AAC-3ML	Audio cable with 15-pin D-subminiature connector and wire leads.

19.6 DEC-S11 Specifications

Note: These specifications are measured at the output of the decoder while generating internal test patterns.

Analog Video Specifications

Analog Video Output Formats

Analog Composite Formats	NTSC, NTSC-J, PAL-I, B, G, H, D or PAL-M

Analog Video Test Parameter	Signal	Units	Value
Insertion Gain Variation	NTC-7 Composite	±IRE	0.15
Sync Amplitude	NTC-7 Composite	40 ±IRE	0.5
Burst Amplitude	NTC-7 Composite	40 ±IRE	0.5
Line Time Waveform Distortion	NTC-7 Composite	< %	0.5
Field Time Waveform Distortion	NTC-7 Composite	< %	1
2T Pulse to Bar Ratio (PB-Ratio)	NTC-7 Composite	100 ±%	3
2T Pulse Shape (K-2T)	NTC-7 Composite	< %	0.5
T Step Overshoot (K-PB)	NTC-7 Composite	< %	0.5
Chrominance – Luminance Gain Inequality	NTC-7 Composite	100 ±%	2
Chrominance – Luminance Delay Inequality	NTC-7 Composite	±ns	10
Chrominance – Luminance Intermodulation	NTC-7 Composite	< %	0.5
Luminance Non Linearity	NTC-7 Composite	< %	2
Chrominance Gain Non-Linearity	NTC-7 Combination	< %	1
Chrominance Phase Non-Linearity	NTC-7 Combination	< Deg	0.5
Differential Gain	NTC-7 Composite	< %	0.5
Differential Phase	NTC-7 Composite	< Deg	0.5
Signal to Noise Ratio (15kHz – 4.2MHz, Unified weighting)	50% Flat Field	dB	67
Signal to Noise Ratio (15kHz – 4.2MHz, Unified weighting)	Shallow Ramp	dB	54
Multiburst 0.5 MHz	NTC-7 Combination	±dB	0.1
Multiburst 1.0 MHz	NTC-7 Combination	±dB	0.1
Multiburst 2.0 MHz	NTC-7 Combination	±dB	0.2
Multiburst 3.0 MHz	NTC-7 Combination	±dB	0.25
Multiburst 3.5 MHz	NTC-7 Combination	±dB	0.2
Multiburst 4.2 MHz	NTC-7 Combination	±dB	0.2
Group Delay	Sine X/X	< ns	30
Group Delay Gain	Sine X/X	< dB	1

Digital Video Specifications

Digital Video Outputs

Formats	SDI (ANSI/SMPTE 259M-1994)
Jitter	Within SMPTE RP 184 specifications
Rate	270 Mbps
Sampling	10-bit 4:2:2 component (8-bit effective)
Connector	75-Ohm BNC

Digital Video Test Parameters

Parameter	NTSC/PAL Test Signal	Specification
Electrical Specifications		
Output Impedance	(75/100)% Colorbars	> 15 dB return loss @ 75-Ohms
Amplitude	(75/100)% Colorbars	800 mV p-p ±10%
Rise Time	(75/100)% Colorbars	0.4 nSec. – 1.5nSec.
Fall Time	(75/100)% Colorbars	0.4 nSec. – 1.5nSec.
Rise Overshoot	(75/100)% Colorbars	<10%
Fall Overshoot	(75/100)% Colorbars	<10%
DC Offset	(75/100)% Colorbars	±0.5V
Jitter		
Timing Jitter 10Hz – 1kHz	(75/100)% Colorbars	0.2 UI p-p
Alignment Jitter 1kHz – 27MHz	(75/100)% Colorbars	0.2 UI p-p
Wander (60 sec. after acquisition):		
Drift Rate (below.5 Hz)	(75/100)% Colorbars	150 ppb/sec.

Component Signal Accuracy and Timing Vectors

Pb Gain	(75/100)% Colorbars	1.00%
Pr Gain	(75/100)% Colorbars	1.00%
Luma Gain	(75/100)% Colorbars	1.00%
Interchannel Delay (Pb – Y)	(75/100)% Colorbars	NGT 10nSec.
Interchannel Delay (Pr – Y)	(75/100)% Colorbars	NGT 10nSec.

Format Monitor and Ancillary Data over 8 Hours

Loss of SDI Signal	(75/100)% Colorbars	0 Count
Active Video Line Length	(75/100)% Colorbars	0 Count
Horizontal Blanking Length	(75/100)% Colorbars	0 Count
Field Length Errors	(75/100)% Colorbars	0 Count
Ancillary Data Errors	(75/100)% Colorbars	0 Count
Ancillary Audio Errors	(75/100)% Colorbars	0 Count
Luminance Error Low	(75/100)% Colorbars	0 Count
Luminance Error High	(75/100)% Colorbars	0 Count
Chrominance Error Low	(75/100)% Colorbars	0 Count
Chrominance Error High	(75/100)% Colorbars	0 Count
Miscellaneous XY (Z) Error	(75/100)% Colorbars	0 Count
Errored Seconds	(75/100)% Colorbars	0 Count
FIFO Overflow Errors	(75/100)% Colorbars	0 Count

Audio Specifications

Audio Decompression Formats	SMPTE 272M-AB

Audio Input	**Rates (Kbps)**
MPEG-1 layer 2	32, 48, 80, 160, 224, 320, 56, 64, 96, 112, 128, 192, 256, 384
ATSC A/52 (Dolby AC-3)	32, 40, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384, 448, 512, 640
SMPTE 302M (uncompressed)	16-bit, 20-bit

Digital Audio Specifications

Digital Audio Outputs

Format	AES (AES3-1992, ANSI S4.40-1992), SMPTE-276M
Sampling	48 KHz at 24-bits
Connectors	75-Ohm BNC

Analog Audio Specifications

Analog Audio

Impedance	Balanced, can drive 600 Ohms
Output Level	+4 dBu with 20 dBu headroom
Connector	15-pin D-sub connector

Analog Audio Parameter	**Test Signal**	**Specification**
Nominal Bandwidth		20.0 Hz to 20.0 kHz
Insertion Gain	0 dBm 400Hz Sine	0.0 ±1.0 dB

Gain-Frequency Response (Relative to 0 dBm @ 1 kHz)

20Hz – 100 Hz	-20 dBm sweep	+0.5 to -0.5 dB
100Hz – 7.5kHz	-20 dBm sweep	+0.5 to -0.5 dB
7.5kHz – 16kHz	-20 dBm sweep	+0.5 to -0.5 dB
16kHz – 20kHz	-20 dBm sweep	+2 to -2 dB

Total Harmonic Distortion

(+4 dBm @ 400 Hz)	Sine	NGT 0.5%
(+4 dBm @ 1 kHz)	Sine	NGT 0.5%
Headroom (Above 0 dBm @ 1 kHz)		NLT 24.0 dB

Signal to Noise Ratio

Unweighted 20 kHz Flat	0 dBm 400Hz Sine	NLT 60.0 dB
Weighted CCIR 468-2 RMS	0 dBm 400Hz Sine	NLT 65.0 dB
Crosstalk	0 dBm 20-20kHz Sweep	NGT -56.0 dB
Level Difference (20 Hz – 20 kHz)	0 sweep	NGT ±0.25 dB
Phase Difference (20 Hz – 20 kHz)	0 sweep	NGT 1.0 Deg

General Specifications

Systems Demultiplex

PCR Jitter Tolerance	1ms
Multiplex Delay	0 to +4ms
Format	MPEG-2 Transport Stream
PSI formats	ISO (IEC 13818.1 MPEG-2 Systems)
Decryption	BISS-E (EBU Tech 3292 rev. 2)

Input Bit Rates

Maximum Transport Stream Input Bit Rate	150 Mbps
Maximum MPEG-2 Decoding Program Bit rate	64 Mbps
Video Bit Rate	Up to 50 Mbps
Audio Bit Rate	Up to 3.1 Mbps per stereo pair (Several stereo pair may be carried in the bitstream. Up to two pair may be selected for decoding).
Ancillary Data bit rate	Up to 7 Mbps per Program

Bandwidth

See Chapter 26: NetVX™ Bandwidth on page 455 for details.

Physical Specifications

DEC-S11 Decoder Module

Height	100 mm	
Width	20 mm	
Depth	160 mm	
Weight	0.3 kg	(0.6 lbs)

Electrical Specifications

DEC-S11 Power Consumption	9 W

Chapter 20: TMX-M12

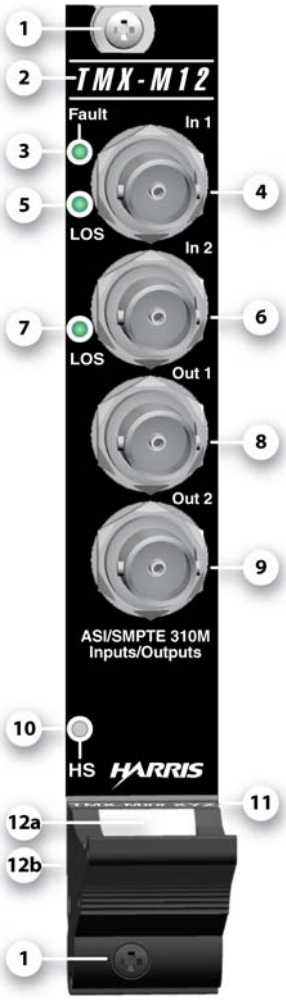
MPEG-2 Transport Stream Multiplexer Module

20

20.1 Overview

The NetVX™ TMX-M12 multiplexes and de-multiplexes MPEG-2 transport streams. The TMX-M12 provides two independent inputs and two independent outputs. Each I/O pair can function independently as either a DVB-ASI or a SMPTE-310M interface. In ASI mode the module's I/Os operate at up to 210 Mbps. In 310M mode the module's I/Os operate at the ATSC broadcast rate of 19.392658 Mbps.

The module's inputs can demultiplex up to 64 MPEG-2 programs on up to 256 PIDs and the module's outputs can multiplex up to 64 MPEG-2 programs on up to 256 PIDs.



The TMX-M12 is 100 mm high by 20 mm wide. Captive Posidriv fasteners at the top and at bottom of the faceplate secure the module in the NetVX™ enclosure. A injector/ejector handle at the bottom of the faceplate engages and disengages the circuit board from the enclosure.

Table 20-1 TMX-M12 Faceplate

#	Label/Description	Function
1	Posidriv captive fasteners	Secures the module in the NetVX™ chassis.
2	Module Identification	Identifies module type and model.
3	Tri-color fault LED	Indicates board state. **Off** Module not powered. **Green** Module is active and no faults are detected. **Amber** Module is booting, offline, or running diagnostics. **Red** Module has detected a hardware fault and should be replaced.
4, 6**	In 1, In 2	SMPTE 310M or ASI Multi-Program Transport Stream Inputs.
5, 7	Tri-color line status LEDs	Indicates state of adjacent input signal. **Off** Interface not configured for use. **Green** Input signal is present and error-free. **Amber** Input signal is present with errors. **Red** Loss of signal or loss of framing.
8, 9*	Out 1, Out 2	SMPTE 310M or ASI Multi-Program Transport Stream Outputs.
10	Hot Swap Ejection Indicator LED	**Off** Module is not ready to be removed from the enclosure. **Blue** Module is ready to be removed from the backplane.
11	Module Model Number	Identifies the module model.
12a	Ejector Release Button	Unlocks the ejector/Injector handle to allow the module to eject.
12b	Injector/Ejector Handle	Disengages the module from the backplane.
* Availability of this selection is determined by the module's feature profile.		

Figure 20-1 TMX-M12 Faceplate

20.2 Electrical Interfaces

20.2.1 Transport Stream Input Interfaces

The TMX-M12 module features two transport stream input interfaces labelled **IN1** and **IN2**. Each input interface is a BNC jack internally terminated at 75 Ohms. Each **IN** jack should be connected to the external equipment's transmit jack with a 75 Ohm characteristic impedance coaxial cable. Cable equalization is provided so that in general, reliable operation can be achieved with cable lengths of up to 300 meters. Unused inputs may be left unconnected.

The input interface type (ASI or 310M) must be configured for proper operation. The adjacent green LED illuminates when a valid input signal is present.

20.2.2 Transport Stream Output Interfaces

The TMX-M12 module features two transport stream output interfaces labelled **OUT1** and **OUT2**. Each output interface is a BNC jack for driving a 75 Ohm load. These two channels carry independent signals. Each **OUT** jack should be connected to the external equipment's receive jack with a 75 Ohm characteristic impedance coaxial cable. In general, reliable operation can be achieved with cable lengths of up to 100 meters. Unused outputs may be left unconnected.

The output interface type (ASI or 310M) must be configured for proper operation.

20.3 TMX-M12 Models and Feature Profiles

Each NetVX™ TMX-M12 module is factory-configured as a particular Module Type. Module Types are composed of a Module Base Type such as "TMX-M12", and a suffix such as "TNL2". The Module Type indicates which premium features are present on the module. The following table identifies each TMX-M12 Module Type.

Table 20-2 TMX-M12 Module Type Definitions

Features	TMX-M12 Module Types				
	TMX-M12-TNL1	TMX-M12-TNL2	TMX-M12-MUX	TMX-M12-MPH	TMX-M12-SCR
Tunnel-mode mapping to/from backplane					
Number of Supported Input Interfaces	1	2	2	2	2
Number of Supported Output Interfaces	1	2	2	2	2
SI insertion from Carousel or UDP stream					
TSID localization					
Demultiplex incoming TS to separate program elements					
Multiplex separate backplane elements into one TS					
Statmux locally-encoded and remotely-encoded streams					
MH Support					
Simulcrypt Support					

Legend	
Supported Feature	
Unsupported Feature	

Identical Module Types are required for the following purposes.

- Application module redundancy requires identically keyed main and backup module types. It is possible to use modules with different feature keys provided that (a) All application-specific features are provided by the backup

module, and (b) The backup module is configured to its base type. This subject is discussed in greater detail in the Vidiem™ Element Management System help topics, “How to Configure a Backup Module” and “Overview of Backup Module Compatibility”.

- Like Module Types are required on modules in any two slots between which Profiles may be copied.

20.4 TMX-M12 Parts List

Table 20-3 TMX-M12 Transport Stream Multiplexer Module Parts List

Part	Description
TMX-M12	Base MPEG-2 Transport Stream Multiplexer

See Table 20-2 TMX-M12 Module Type Definitions on page 148 above for details regarding the following keys.

TMX-M12-TNL1	MPEG-2 Transport Stream Multiplexer Feature Key
TMX-M12-TNL2	MPEG-2 Transport Stream Multiplexer Feature Key
TMX-M12-MUX	MPEG-2 Transport Stream Multiplexer Feature Key

20.5 TMX-M12 Specifications

Electrical Specifications

ASI Input

Connector	BNC
Clock rate	270 MHz ±100 ppm
Logic levels	880 mV–200 mV p-p
Data Rate	0–210 Mbps
Packet Size	188 or 204
Applicable Standards	DVB-ASI A011 Rev 1.0

ASI Output

Connector	BNC
Clock rate	270 MHz ±1 ppm
Logic levels	800 mV p-p ±10%
Data Rate	0–210 Mbps in 100 bps increments
Packet Size	188 or 204
Applicable Standards	DVB-ASI A011 Rev 1.0

310M Input

Connector	BNC
Load	75 Ohms resistive
Peak-to-Peak voltage	880 mV – 200 mV p-p
Rate	19.392658 MHz ±100 ppm
Format	Bi-phase-mark coding
Applicable Standards	SMPTE 310M

310M Output

Connector	BNC
Peak-to-Peak voltage	800 mV ±10%
Rate	19.392658 MHz ±1 ppm*
Format	Bi-phase-mark coding
Applicable Standards	SMPTE 310M

Bandwidth

See Chapter 26: NetVX™ Bandwidth on page 455 for details.

MPEG Specifications

De-Multiplexing

Programs/PIDs supported (total across both inputs)	64 Programs/256 PIDs

Multiplexing

Programs/PIDs supported (total across both inputs)	64 Programs/256 PIDs
PCR Accuracy	325 ns
PSI Generation	PAT, PMT

Physical Specifications

TMX-M12 Transport Stream Multiplexer Module

Height	100 mm	
Width	20 mm	
Depth	160 mm	
Weight	0.3 kg	(0.6 lbs)

Electrical Specifications

TMX-M12 Power Consumption ..... 11 W

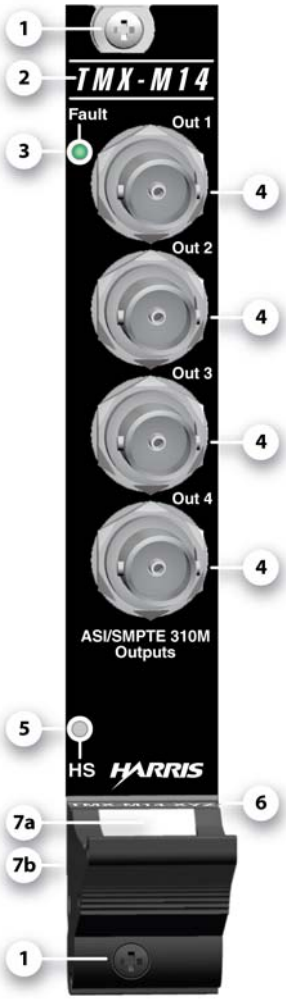
*** All specifications are subject to change without notice. ***

Chapter 21: TMX-M14

MPEG-2 Transport Stream Multiplexer Module

21

21.1 Overview



The NetVX™ TMX-M14 multiplexes MPEG-2 transport streams. The TMX-M14 provides up to two (2) independent, multiplexed signals on up to as many as four (4) BNC interfaces. Each TMX-M14 can multiplex a total of 64 MPEG-2 programs on up to 256 PIDs. Output on each BNC is provided as either DVB-ASI or SMPTE-310M. ASI output ranges from 0–214 Mbps. 310M output is provided at the ATSC broadcast rate of 19.392658 Mbps.

Table 21-1 TMX-M14 Faceplate

#	Label/Description	Function
1	Posidriv captive fasteners	Secures the module in the NetVX™ chassis.
2	Module Identification	Identifies module type and model.
3	Tri-color fault LED	Indicates board state. **Off** Module not powered. **Green** Module is active and no faults are detected. **Amber** Module is booting, offline, or running diagnostics. **Red** Module has detected a hardware fault and should be replaced.
4	Out 1–4	SMPTE 310M or ASI Multi-Program Transport Stream Outputs.
5	Hot Swap Ejection Indicator LED	**Off** Module is not ready to be removed from the enclosure. **Blue** Module is ready to be removed from the backplane.
6	Module Model Number	Identifies the module model.
7a	Ejector Release Button	Unlocks the ejector/Injector handle to allow the module to eject.
7b	Injector/Ejector Handle	Disengages the module from the backplane.

Figure 21-1 TMX-M14 Faceplate

The TMX-M14 also features eight (8) internal multiplexers and eight (8) internal de-multiplexers.

Each internal multiplexer combines signals received from other modules* installed in the NetVX™ system. The TMX-M14 provides the resulting Multi-Program Transport Stream (MPTS) to as many as eight (8) other modules over the system backplane.

Each internal de-multiplexer processes an MPTS received from another module in the NetVX™ system into one or more Single-Program Transport Streams (SPTS). The TMX-M14 provides each SPTS to as many as eight (8) other modules over the system backplane.

The TMX-M14 is 100 mm high by 20 mm wide. Captive Posidriv fasteners at the top and at bottom of the faceplate secure the module in the NetVX™ enclosure. A injector/ejector handle at the bottom of the faceplate engages and disengages the circuit board from the enclosure.

* Other modules present use the backplane to present input signals to the TMX-M14.

21.2 Electrical Interfaces

21.2.1 Transport Stream Output Interfaces

The TMX-M14 module features four transport stream output interfaces labelled **OUT1**, **OUT2**, **OUT3**, and **OUT4**. Each output interface is a BNC jack for driving a 75 Ohm load. Each of four channels carry independent signals.

Each **OUT** jack should be connected to the external equipment's receive jack with a 75 Ohm characteristic impedance coaxial cable. In general, reliable operation can be achieved with cable lengths of up to 100 meters. Unused outputs may be left unconnected. The output interface type (ASI or 310M) must be configured for proper operation.

21.3 TMX-M14 Models and Feature Profiles

Each NetVX™ TMX-M14 module is factory-configured as a particular Module Type. Module Types are composed of a Module Base Type such as "TMX-M14", and a suffix such as "TNL4". The Module Type indicates which premium features are present on the module. The following table identifies each TMX-M14 Module Type.

Table 21-2 TMX-M14 Module Type Definitions

Features	TMX-M14 Module Types
	TMX-M14-TNL4
Tunnel-mode mapping to/from backplane	
Number of Supported Output Interfaces	4

Legend	
Supported Feature	
Unsupported Feature	

Identical Module Types are required for the following purposes.

- Application module redundancy requires identically-keyed main and backup module types. It is possible to use modules with different feature keys provided that (a) All application-specific features are provided by the backup module, and (b) The backup module is configured to its base type. This subject is discussed in greater detail in the Vidiem™ Element Management System help topics, "How to Configure a Backup Module" and "Overview of Backup Module Compatibility".
- Like Module Types are required on modules in any two slots between which Profiles may be copied.

21.4 TMX-M14 Parts List

Table 21-3 TMX-M14 Transport Stream Multiplexer Module Parts List

Part	Description
TMX-M14	Base MPEG-2 Transport Stream Multiplexer
See Table 21-2 TMX-M14 Module Type Definitions on page 154 above for details regarding the following keys.	
TMX-M14-TNL4	MPEG-2 Transport Stream Multiplexer Feature Key

21.5 TMX-M14 Specifications

Electrical Specifications

ASI Output

Connector	BNC
Clock rate	270 MHz ±1 ppm
Logic levels	800 mV p-p ±10%
Data Rate	0–210 Mbps in 100 bps Increments
Packet Size	188 or 204
Applicable Standards	DVB-ASI A011 Rev 1.0

310M Output

Connector	BNC
Peak-to-Peak voltage	800 mV ±10%
Rate	19.392658 MHz ±1 ppm*
Format	Bi-phase-mark coding
Applicable Standards	SMPTE 310M

Bandwidth

See Chapter 26: NetVX™ Bandwidth on page 455 for details.

MPEG Specifications

De-Multiplexing

Programs/PIDs supported (total across all demultiplexer interfaces)	64 Programs/256 PIDs

Multiplexing

Programs/PIDs supported (total across both inputs)	64 Programs/256 PIDs
PCR Accuracy	325 ns
PSI Generation	PAT, PMT

Physical Specifications

TMX-M14 Transport Stream Multiplexer Module

Height	100 mm	
Width	20 mm	
Depth	160 mm	
Weight	0.3 kg	(0.6 lbs)

Electrical Specifications

TMX-M14 Power Consumption	12 W

* All specifications are subject to change without notice. *

Chapter 22: Craft Port Interface Introduction 22

22.1 Overview

The craft port command language provides four top-level commands. Each of these commands focuses on one area of the system's operation.

```
cfg
```

Use the cfg command to read and to modify system configuration parameters. Any configuration parameter that can be changed is located under the cfg command.

```
alm
```

Use the alarm command (alm) to view summaries of system operation. The alm gives an overview of unusual conditions and provides a history of events.

```
stat
```

The status command displays status parameters and read-only values such as counts. Status commands provide detailed information about the system's operation.

```
util
```

Utility commands initiate an action or change the system's behavior. Use these commands to set IP communication parameters, reset the system, load new firmware, or set the system date and time.

22.2 How to Set Values

Use the configuration command (cfg) to set values. All NetVX™ configuration commands share the same basic command syntax. In abstract, the syntax for assigning values looks like this:

```
command branch configuration_parameter=value
```

Here is an actual example:

```
cfg slot.3/enc.1/vid aspect=4x3
```

In this example:

- ‘cfg’ indicates the configuration ***command***. The use of this command indicates something is being set. In contrast, the ‘stat’ command suggests a statistic is being read.
- ‘slot.3’ is the ***slot index*** and addresses the module in slot 3.
- ‘enc.1’ is the ***encoder index*** and addresses the first (and typically the only) encoder in the module.
- ‘vid’ identifies the video ***group***.
- ‘aspect’ (aspect ratio) identifies the ***configuration parameter*** to set.
- ‘4x3’ is the ***value*** assigned to this configuration parameter.

In this example, the slot index, the encoder index, and the group identifier together form a ***branch***. The NetVX™ allows simultaneous assignment of multiple configuration parameters in the same group. Therefore, following line assigns both the encoding video aspect ratio and the resolution.

```
cfg slot.3/enc.1/vid aspect=16x9 res=std-352-420
```

This example could be extended to assign all configuration parameters in this group.

22.3 How to Read Values

To read settings, specify each configuration parameter alone, without any value assignments.

```
cfg slot.3/enc.1/vid aspect res
```

The preceding command line returns the following result.

```
cfg slot.3/enc.1/vid
aspect=16x9
res=std-352-420
```

22.4 Shortcuts

Use these shortcuts to save time reading and writing configuration parameter settings.

22.4.1 Index Abbreviations

Any index that is a single, fixed value can be abbreviated.

Long Form

```
cfg slot.3/enc.1/vid aspect=16x9 res=std-352-420
```

Abbreviated Form

```
cfg slot.3/enc/vid aspect=16x9 res=std-352-420
```

The encoder's index number is omitted because the ENC-S11 module contains only a single encoder.

However, the encoder index number would be required if the module had more than one encoder.

22.4.2 Configuration Parameter Abbreviations

Abbreviate any configuration parameter by using the fewest number of characters that can uniquely identify it within its parameter group.

Long Form

```
cfg slot.3/enc/vid aspect=16x9 res=std-352-420
```

Abbreviated Form

```
cfg slot.3/enc/vid a=16x9 r=std-352-420
```

This example uses configuration parameters from the encoder's video group. This group contains the following configuration parameters.

```
aspect, go, input, offset, quant, res, vidDeg, vidFlt
```

All but the last two configuration parameters can be abbreviated using only their first letter. The last two configuration parameters must be abbreviated as 'vidd' and 'vidf' because these abbreviations are the shortest strings that can uniquely identify these configuration parameters.

22.4.3 Keyboard Shortcuts

The NetVX™'s command line interface maintains a history of commands it receives.

- The up arrow key moves backwards through the history of previous commands. Another way to do this is to use `ctrl+p` .
- The down arrow key moves forward through the command history; so does `ctrl+n`.
- The right and left arrow keys function typically by moving the cursor within the line.

22.5 Special Characters

The NetVX™'s craft port interface utilizes the following special characters.

22.5.1 ? = Help

Enter a question mark at any point in the command line for a description of choices that are available at that position.

This line returns help descriptions for each video encoder configuration parameter.

```
cfg slot.3/enc/vid ?
```

This line returns a list of module-specific branch options for slot 3.

```
cfg slot.3 ?
```

This line returns configuration branch options.

```
cfg ?
```

22.5.2 Asterisk Substitution

Use the asterisk to refer to all configuration parameters, all groups, or all indices. For example:

This line returns all video configuration parameter values for the encoder in slot 3.

```
cfg slot.3/enc/vid *
```

This line returns all configuration parameter values for slot 3.

```
cfg slot.3 *
```

This line returns all configuration parameter values.

```
cfg *
```

This line returns all status parameters.

```
stat *
```

Note: If the asterisk is omitted, then all values for the specified branch level are returned.

Use asterisks in place of indices to create a "side by side" list of values across modules.

This line returns a list of video resolutions for each encoder in the system.

```
cfg slot.*/enc/vid res
```

22.6 Overview of NetVX™ Tags

The NetVX™'s "tag" configuration parameters allow you to apply meaningful (or not so meaningful) names specific system and sub-system configuration elements. The following list identifies the command path and use for each NetVX™ tag.

```
cfg slot.s/atm/ifc.m tag = 'name of atm interface'
cfg slot.s/atm/vc.m tag = 'name of virtual channel'
cfg slot.s/dec.m/pgm tag = 'name of decoding program'
cfg slot.s/enc.m/pgm tag = 'name of encoding program'
cfg sys/gen tag = 'name of the system'
cfg sys/trap.m tag = 'name of trap monitoring location'
cfg sys/xc.m tag = 'name of cross connection'
cfg sys/gen cfgtag = 'name of the configuration'
```

The following sections list a few guidelines for special case tag names.

22.6.1 Spaces in Tags

Use double quotes around a tag value containing one or more spaces.

```
cfg slot.3/enc/pgm tag=“Salt Lake Skeleton Cam 2 Encoder”
```

Tags that do not contain spaces (below) do not need quotes.

```
cfg slot.3/enc/pgm tag=SaltLakeSkeletonCam2Encoder
```

22.6.2 Quotes and Backslashes in Tags

Precede each double quote and each back slash in a tag value with a back slash.

```
cfg slot.3/enc/pgm tag=”Salt Lake \“Special\” Cam 2”
```

This would assign the tag with the following literal text.

```
Salt Lake “Special” Cam 2
```

22.6.3 Case Sensitivity in Tags

The NetVX™ does not distinguish upper-case and lower-case letters in commands, in branches, or in configuration parameters. However uppercase is preserved when it is used in tags is preserved as written.

22.7 Overview of Cross Connections

The NetVX™ uses Cross Connections to link signals internally among application modules. More specifically, cross connections links signal between virtual channels. Further, you can use cross connections to link signals from a single source to up to eight other destinations.

22.7.1 The Cross Connection (XC) Table

Each Cross Connection is numbered. The number serves as an index in the Cross Connection table which lists all cross connects. All cross connection configuration and status parameters use this number as an index to uniquely identify a cross connect. The table below provides a sample illustration of how configuration parameters are arranged in the cross connection table.

Table 22-1 Cross Connection Table Example

RowState	dchan	dslot	schan	sslot
new	240	2	1	6
active	1	3	1	7
destroy	1	4	1	8
inactive	1	5	1	9

The rowstate configuration parameter (described in this section, see cfg sys/xc.m rowstate) governs the state of the cross connection.

22.8 How to Diagnose Faults

22.8.1 How to Diagnose the Source of System Faults

When the front panel’s “System” LED turns either Red or Amber, use the following command to determine the exact cause of NetVX™ mechanical fault.

```
alm current
```

This command provides a list of all current alarms similar to the list below.

```
SeverityTypeLocation
major audFltslot.1/enc.1/aud.1
warningaudDegslot.1/enc.1/aud.1
```

The following command line may also be helpful.

```
stat sys/mech/*
```

This returns lines similar to those shown below. Any line with the value “fault” (rather than noFault) is the likely cause of the system error or alarm.

```
cibFlt = noFault
fan1Flt = noFault
fan2Flt = noFault
gpoFlt = 0000
pwrFlt = noFault
pwr1Flt = noFault
pwr1Pres = unknown
pwr2Flt = noFault
pwr2Pres = unknown
temp = 0 degrees C
volt1Flt = noFault
volt2Flt = noFault
volt3Flt = noFault
volt4Flt = noFault
```

22.8.2 How to Diagnose the Source of Module Faults

Use the following command line, when the front panel’s “Module” LED turns either Red or Amber, to determine slots containing the modules indicating any fault.

```
alm current
```

This command provides a list of all current alarms similar to the list below.

```
SeverityTypeLocation
major audFltslot.1/enc.1/aud.1
warningaudDegslot.1/enc.1/aud.1
```

The following command line may also be helpful.

```
stat slot.*/gen fault
```

This returns lines similar to those shown below. Each pair of lines represents the fault state for each slot. Any line that does not show “fault = None” is the likely cause of the module fault.

```
/stat slot.1/gen:
     fault = None
/stat slot.2/gen:
     fault = None
...
/stat slot.17/gen:
     fault = None
```

22.8.3 How to Diagnose the Source of Input Faults

Use the following command line, when the front panel’s “input” LED turns either Red or Amber, to determine the input responsible for a fault.

```
alm current
```

The following line returns the state of all encoder (only) LOS variables.

```
stat slot.*/enc.*/* los
```

22.9 Virtual Channel Configuration Parameters

Use the configuration parameters listed in this section to modify Virtual Channel settings.

The Virtual Channel (VC) number serves as an index in the VC table. The VC table contains a column for each VC configuration parameter as shown below.

Table 22-2 Virtual Channel Table Example

VC #	Function	ifc	rxRate	mpegAal5Size	mpegProc	txrate	rowstate	tag	vcDeg	VPI	VCI
22	mpeg-aal1	1	7	38	cbr	9	active	vid1	enable	210	1354
24	mpeg-aal1	1	7	38	cbr	8	active	vid2	enable	210	1355

To create a new table entry, the user selects an unused index and assigns values to the columns. For example, to create a new VC, first display the VC table using the following command.

```
cfg slot.4/atm/vc
```

Existing rows are displayed. Identify an unused, or inactive VC entry, for example VC 23.

Now use VC index number 23 to set several VC-related variables.

```
cfg slot.4/atm/vc.23 tag=“Chicago”
cfg slot.4/atm/vc.23 vpi=6 vci=156
cfg slot.4/atm/vc.23 rowState=active
```

The system includes an entry for VC 23 the next time the table is displayed.

Assigning tag=“Chicago” (or giving a value to any other variable) in row 23 creates that row if it does not already exist. The system assigns rowState=inactive for the new row. As the example illustrates, the row must explicitly be moved out of the inactive state by setting rowState.

Assign the special value “destroy” to the rowState variable to delete a row. This action deletes the VC regardless of the row's current state. A “visible” table entry never displays the destroy value for rowState.

Chapter 23: Craft Port Command Reference 23

23.1 Configuration Parameters

The configuration command is abbreviated “cfg”. The parameters that follow specify which system elements are addressed.

23.1.1 ATM Interface Configuration Parameters

cfg slot.s/atm/ifc.m

slot.s s = Slot number.
- 3–17 SYS-1700’s range of application module slot numbers.
- 2–4 SYS-200/SYS-300’s range of application module slot numbers.

ifc.m m = Interface (ifc) number (1–2)
- ifc.1 Specifies the ATM module’s SONET/SDH (OC-3 & STM1) interface. Use this index number to address the ATM-X11’s BITS interface which is associated with the SONET/SDH optical interface.
- ifc.2 Specifies the ATM module’s PDH (DS3/E3) interface.

Use these configuration parameters to modify general ATM interface settings.

cfg slot.s/atm/ifc.m **bitsIbo**

Value(s): in, out

Description: Specifies the BITS line buildout configuration. The values of this parameter let the module adjust the BITS transmit signal strength and receive sensitivity to the appropriate level.

in Configuring the buildout in uses a lower signal level.

out Configuring the buildout out uses a higher signal level.

Intro/Update: 6.7.0/8.1.1

cfg slot.s/atm/ifc.m **bitsstandard**

Value(s): e1, t1

Description: Specifies the BITS clock standard. An interface that puts its interface line clock in BITS mode uses this value to know what BITS clock type to receive, and it retransmits the same type. When an interface runs with its line clock in ‘loop’ or ‘internal’ mode, this value indicates which BITS clock signal to transmit.

e1 Specifies an E1-compatible clock.

t1 Specifies a T1-compatible clock.

Intro/Update: 6.7.0/6.7.0

cfg slot.s/atm/ifc.m **clock**

Value(s): internal, loop, bits

Description: Sets the SONET/SDH line clock source.

internal The interface uses an internal reference.

loop The interface recovers timing from the input signal.

bits The interface uses a line clock derived from the Building Integrated Timing Signal (BITS); also known as Synchronization Supply Unit or (SSU). This external BITS signal is valid only for optical interfaces on modules that support BITS. See the descriptions of the cfg slot.s/atm/ifc.m bitsstandard, and cfg slot.s/atm/ifc.m bitslbo parameters for additional details.

Intro/Update: 2.0.0/6.7.0

cfg slot.s/atm/ifc.m **ds3lbo**

Value(s): in, out

Description: This configuration parameter controls the DS3 line build out (attenuation) setting.

in Use this setting when the DS3 cable is less than 225 feet.

out Use this setting when the DS3 cable is longer than 225 feet.

Intro/Update: 2.0.0/4.0.0

cfg slot.s/atm/ifc.m **loop**

Value(s): OFF, internal, external

Description: This configuration parameter controls the loopback setting.

OFF The ATM module performs transmit and receive operation.

internal Data originating on the system and destined for the transmit interface are returned (looped back) to the system via the receive interface. No data are received by external equipment for routing and the clock source is ignored.

external Data originating on the network and entering on the receive interface are returned (looped back) to the network via the transmit interface. No data are accepted for routing and the clock source is ignored.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/atm/ifc.m **mode**

Value(s): OFF, bidirectional, rxonly, txonly

Description: Use this control to specify the mode of operation for this ATM Interface.

*OFF ** Deactivates the interface but allows VC creation. However VCs remain inactive until the interface is activated. Alarms are suppressed on inactive interfaces.

bidirectional This option configures the interface to both send and receive data.

rxonly Functions like “bidirectional”.

txonly This option configures the interface to send data only. The receive-side of the interface is disabled.

Note: * Availability of this selection is determined by the module’s feature profile.
See Table 11-2, "ATM-M11 and ATM-S11 Module Type Definitions" on page 86. See also util key .

Intro/Update: 2.0.0/5.6.0

cfg slot.s/atm/ifc.m **netDeg**

Value(s): enable, disable

Description: Network Degrade Alarm Enable.

Note: Use the cfg sys/alm netDegSev command to set this alarm’s severity level.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/atm/ifc.m **netFlt**

Value(s): enable, disable

Description: Network Fault Alarm Enable.

Note: Use the cfg sys/alm netFltSev command to set this alarm's severity level.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/atm/ifc.m **protnetFlt**

Value(s): enable, disable

Description: Enables or disables the protection switching trigger for this interface.

enable Configures the module to failover to its backup in the event this interface experiences a Network Fault Alarm condition (see important note below).

disable Configures the module not to failover.

Note 1: Use the cfg sys/alm netFltSev command to set this alarm's severity level.

Note 2: WARNING: Failover events affect the entire module. Both the OC-3 and DS-3 interfaces are affected by a failover.

Intro/Update: 5.6.0/5.6.0

cfg slot.s/atm/ifc.m **standard**

Value(s): sonet, sdh, ds3-m23-adm, ds3-m23-plcp, ds3-cbit-adm, ds3-cbit-plcp, e3-751-adm, e3-751-plcp, e3-832-adm

Description: Sets the I/O interface standard and associated selection parameters.
The SONET and SDH options are applicable to interface 1; all others interface 2.

sonet Specifies use of SONET framing on the optical interface; interface 1.

sdh Specifies use of SDH framing on the optical interface; interface 1.

ds3-cbit-adm Specifies use of DS3 with cbit parity direct mapped onto ATM.

ds3-cbit-plcp Specifies use of DS3 with CBIT parity and PLCP framing.

ds3-m23-adm (default) Specifies use of DS3 format with M23 emulation direct mapped onto ATM.

ds3-m23-plcp Specifies use of DS3 with M23 emulation and PLCP framing.

e3-751-adm Specifies use of E3 using G.751direct mapped onto ATM.

e3-751-plcp Specifies use of E3 using G.751 and PLCP framing.

e3-832-adm Specifies use of E3 using G.832 direct mapped onto ATM.

Note: See Table 26.5, "ATM Standards and Rate Calculations" on page 461 for details.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/atm/ifc.m **tag**

Value(s): Any text string up to 31 characters.

Description: Specifies a name for this ATM interface.

Note: See Section 22.6, "Overview of NetVX™ Tags" on page 159.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/atm/ifc.m **txrate**

Value(s): 0.00 to 155.00 (Mbps, fixed 3.2 format)

Description: Use this command to set the maximum user payload rate on interface. This parameter sets an upper bound on the lowest priority traffic on the interface. The value specified is the ATM rate, including the ATM cell header overhead.

Note: See Table 26.5, "ATM Standards and Rate Calculations" on page 461 for details.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/atm/ifc.m **rxpathtraceexp**

Value(s): <null>, <62-character string>, <15-character string>

Description: Use this command to specify the string that this interface expects to receive as the result of a successful ATM path trace.

When this parameter is set to a non-null value, its setting is compared to the status value of stat slot.s/atm/ifc.1/ss rxPathTraceRcv. In the event these values are not identical, the Network Degrade - Errors in Input Signal alarm is raised, the stat slot.s/atm/ifc.m rxerrsec errored-seconds counter increments, and the 'Interface' LED turns 'amber'.

<null> The null (empty) string disables rxpathtrace.

<15-char> Use a 15-character string for SDH networks.

<62-char> Use a 62-character string for SONET networks.

Note 1: This parameter is only available on interface 1 (e.g. cfg slot.s/atm/ifc.1 rxpathtraceexp).

Note 2: When this parameter is set to a non-null value, its setting is compared to the status value of stat slot.s/atm/ifc.1/ss rxPathTraceRcv. In the event these values are not identical, the Network Degrade - Errors in Input Signal alarm is raised, the stat slot.s/atm/ifc.m rxerrsec errored-seconds counter increments, and the 'Interface' LED turns 'amber'.

Intro/Update: 8.1.1/8.1.1

cfg slot.s/atm/ifc.m **txpathtrace**

Value(s): 62-character string for SONET networks, 62-character string for SONET networks

Description: Use this command to specify the string that this interface shall send as an ATM path trace. Path trace is a means of verifying that interfaces are properly connected. The usual contents of a path trace message are the identification of the transmitter, similar to the configuration tag.

<null> The null (empty) string disables rxpathtrace.

<15-char> Use a 15-character string for SDH networks.

<62-char> Use a 62-character string for SONET networks.

Note 1: This parameter is only available on interface 1 (e.g. cfg slot.s/atm/ifc.1 txpathtrace).

Note 2: See cfg slot.s/atm/ifc.m rxpathtraceexp for more details.

Intro/Update: 8.1.1/8.1.1

23.1.2 ATM Interface Receive Router Configuration Parameters

cfg slot.s/atm/ifc.m/rxrtr

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

ifc.m m = Interface (ifc) number (1–2)
- ifc.1 Specifies the ATM module's SONET/SDH (OC-3 & STM1) interface.
- ifc.2 Specifies the ATM module's PDH (DS3/E3) interface.

Use these configuration parameters to modify router settings for the ATM module's receive interfaces.

cfg slot.s/atm/ifc.m/rxrtr **in**

Value(s): 1–n (n = the number of router inputs)

Description: Specifies the router (input) port receiving its signal directly from the transmit jack of the ATM switch. Example: On a 12x1 router, valid values for this item would range from 1 to 12.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/atm/ifc.m/rxrtr **lvl**

Value(s): Up to 31 characters

Description: Specifies the router level associated with the signal received by this interface.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/atm/ifc.m/rxrtr **out**

Value(s): 1–n (n = the number of router outputs)

Description: Specifies the router (output) port connected directly to ATM-M11/S11 module's "RX" jack. Example: On a 12x1 router, "1" is the only valid Output Port value.

Intro/Update: 2.2.0/3.3.0

23.1.3 ATM Interface Transmit Router Configuration Parameters

cfg slot.s/atm/ifc.m/txrtr

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

ifc.m m = Interface (ifc) number (1–2)
- ifc.1 Specifies the ATM module's SONET/SDH (OC-3 & STM1) interface.
- ifc.2 Specifies the ATM module's PDH (DS3/E3) interface.

Use these configuration parameters to modify router settings for the ATM module's transmit interfaces.

cfg slot.s/atm/ifc.m/txrtr **in**

Value(s): 1–n (n = the number of router inputs)

Description: Specifies the router (input) port receiving its signal directly from the ATM-M11/S11 module's "TX" jack. Example: On a 12x1 router, valid Input Port values range from 1 to 12.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/atm/ifc.m/txrtr **lvl**

Value(s): Up to 31 characters

Description: Specifies the router level associated with the signal transmitted from this interface.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/atm/ifc.m/txrtr **out**

Value(s): 1–n (n = the number of router outputs)

Description: Specifies the router (output) port connected directly to the ATM switch.
Example: On a 12x1 router, “1” is the only valid Output Port value.

Intro/Update: 2.2.0/3.3.0

23.1.4 ATM Interface IP Port Route Table Configuration Parameters

cfg slot.s/atm/ipp.m

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

ipp.m m = Range of ATM IP ports (1–63)

cfg slot.s/atm/ipp.m **port**

Value(s): 0 to 65535
Description: Internet Protocol (IP) port.
Intro/Update: (Available in a future release)

cfg slot.s/atm/ipp.m **vc**

Value(s): 0, 1 to 255
Description: Virtual Channel (VC) assignment. Zero indicates unused entry.
Intro/Update: (Available in a future release)

23.1.5 ATM Interface Virtual Channel Configuration Parameters

cfg slot.s/atm/vc.m

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

vc.m m = Virtual Channel Number (1–255)

Use these configuration parameters to modify ATM virtual channel settings.

cfg slot.s/atm/vc.m **copyvc**

Value(s): 0 to 255
Description: If non-zero, and service is not an AAL-0 type, a copy of each ATM cell should be sent to AAL-0 processing using this field as the virtual channel number.
Intro/Update: 3.1.0/3.1.0

cfg slot.s/atm/vc.m **function**

Value(s): atm, atm-vp, mpeg-aal1-ce, mpeg-aal1-j82, mpeg-aal5, ipoa, lan-vc, lan-llc

Description: Indicates Type-AAL-rate-PDUsize. CBR (constant bit rate) indicates NULL packet insertion on transmission. CBR and CE (circuit emulation) indicates adaptive PCR recovery.

atm Use this function with a VC carrying ATM cells. without extracting user payload.

atm-vp Use this function with a VC to route ATM cells according to VPI (cfg slot.s/atm/vc.m vpi). Any VC operating in this mode accepts only those cells received through the ATM interface that share its VPI value. For cells transmitted through the ATM interface, the configured VPI value is inserted into all the ATM cell headers, while the cells' existing VCI values (cfg slot.s/atm/vc.m vci) are preserved.

mpeg-aal1-ce Use this function when This function means the VC carries MPEG transport stream using circuit emulation AAL-1 encapsulation (without forward error correction).

*mpeg-aal1-j82** Use this function with a VC carrying MPEG transport stream using AAL-1 encapsulation with forward error correction. See Notes 2 & 3 below.
ATM_cell_rate = output_rate * 128/124 * 53/47

mpeg-aal5 Use this function with a VC carrying MPEG transport stream using AAL-5 encapsulation. The ATM cell rate depends on the MPEG AAL-5 size setting (See cfg slot.s/atm/vc.m mpegaal5size). See Note 2 below.

ipoa Use this function with a VC carrying IP on ATM (IPOA) traffic.

VC as a Destination – When operating as a cross connection destination, the VC receives IP packets from the backplane and encapsulates them in ATM cells for transmission on the network interface.

VC as a Source – When operating as a cross connection source, the VC collects incoming ATM cells from the interface, strips off the ATM headers, builds IP packets, and puts those IP packets on the backplane.

lan-vc This channel will carry LAN traffic without LLC encapsulation. When the VC is a destination of a cross-connect entry, it receives LAN frames from the backplane and encapsulates them in ATM cells for transmission on the network interface. RFC 1483 describes this as the "VC Based Multiplexing" method for carrying LAN traffic over ATM AAL5. When the VC is a source, it collects incoming ATM cells from the interface, strips the ATM headers, builds LAN frames, and puts those frames on the backplane. When used in a cross-connect entry, a channel with this function should be paired with another LAN channel.

VC as a Destination – When operating as a cross connection destination, the VC receives LAN frames from the backplane and encapsulates them in ATM cells for transmission on the network interface. RFC 1483 describes this as the 'VC Based Multiplexing' method for carrying LAN traffic over ATM AAL5.

VC as a Source – When operating as a cross connection source, the VC collects incoming ATM cells from the interface, strips the ATM headers, builds LAN frames, and puts those frames on the backplane. When used in a cross-connect entry, a channel with this function should be paired with another LAN channel.

lan-llc This channel will carry LAN traffic with LLC encapsulation. When the VC is a destination of a cross-connect entry, it receives LAN frames from the backplane and encapsulates them by prefixing the LAN PDU with an IEEE 802.2 Logical Link Control (LLC) header and then encapsulating them in ATM cells for transmission on the network interface. RFC 1483 describes this as the "LLC Encapsulation" method for carrying LAN traffic over ATM AAL5.

VC as a Source – It collects incoming ATM cells from the interface, strips the ATM and LLC headers, builds LAN frames, and puts those frames on the backplane. When used in a cross-connect entry, a channel with this function should be paired with another LAN channel.

VC as a Destination – When operating as a cross connection destination, the VC receives LAN frames from the backplane and encapsulates them by prefixing the LAN PDU with an IEEE 802.2 Logical Link Control (LLC) header and then encapsulating them in ATM cells for transmission on the network interface. RFC 1483 describes this as the 'LLC Encapsulation' method for carrying LAN traffic over ATM AAL5.

Note 1: * Availability of this selection is determined by the module's feature profile. See Table 11-2, "ATM-M11 and ATM-S11 Module Type Definitions" on page 86. See also util key.

Note 2: Each ATM-M11, ATM-S11 module supports up to 63 MPEG-AAL1/AAL5 VCs.

Note 3: In releases prior to 6.1.0 the option "mpeg-aal1-j82" was known as "mpeg-aal1".

Note 4: In releases prior to 6.1.0 the option “lan-vc” was known as “lan”.

Intro/Update: 2.0.0/6.1.0

cfg slot.s/atm/vc.m **ifc**

Value(s): 1 or 2

Description: Associates the specified virtual channel with a specific ATM module and a specific ATM interface on the that module.

1 Indicates the module’s optical (SONET/SDH) interface.

** 2* Indicates the module’s electrical (DS3) interface.

Note: * Availability of this selection is determined by the module’s feature profile.
See Table 11-2, "ATM-M11 and ATM-S11 Module Type Definitions" on page 86. See also util key .

Intro/Update: 2.0.0/4.0.0

cfg slot.s/atm/vc.m **lis**

Value(s): 1 to 63

Description: Associates the specified virtual channel with a logical IP subnet.

Intro/Update: 2.0.0/4.0.0

cfg slot.s/atm/vc.m **mpegaal5size**

Value(s): 2, 14, 38

Description: Specifies the number of transport stream packets in each AAL-5 Physical Data Unit (PDU).

2 Use this setting with most MPEG-2 applications.
Using this setting... ATM_cell_rate = output_rate * 384/376 * 53/48
(Available in a future release)

14 Use this setting with certain ATM I/O cards that have a 16-bit limit.
Using this setting... ATM_cell_rate = output_rate * 2640/2632 * 53/48

38 Use this setting when encoding material that will be stored on and retrieved from a server. Using this setting... ATM_cell_rate = output_rate * 7152/7144 * 53/48

Intro/Update: 2.0.0/5.7.0

cfg slot.s/atm/vc.m **mpegproc**

Value(s): cbr, passthrough, vbr

Description: Specifies whether or not the system should pad the MPEG-2 transport stream with nullpackets. This value applies only when the virtual channel's payload type carries MPEG.

cbr (Constant Bit Rate) Incoming packets receive timestamps with modified clock values in order to make them appear as if they had arrived at a fixed interval.
Outgoing packets are read from their buffer at a constant rate. Null transport stream packets are inserted to adjust the output rate of the multiplex to the required output value.
Packets in “CBR” streams DO HAVE adjusted PCRs. The PCRs in CBR output packets are adjusted as follows: adjusted_PCR = original_PCR + (system_clock - timestamp)

passthrough Incoming packets receive timestamps with modified clock values to make them appear as if they had arrived at fixed intervals.
Outgoing packets are read from their buffers at the highest rate possible without exceeding the configured Output Rate. No null packets are inserted.
Packets in “Passthrough” streams DO NOT HAVE adjusted PCRs.

vbr (Variable Bit Rate) Incoming packets receive timestamps with the system’s clock values. No adjustment is made to simulate a regular arrival interval between packets.
Outgoing packets are read from their buffers at the highest rate possible without exceeding the configured Output Rate. No null packets are inserted.
Packets in VBR streams DO NOT HAVE adjusted PCRs.

Intro/Update: 2.0.0/5.8.0

cfg slot.s/atm/vc.m **rowstate**

Value(s): active, inactive

Description: This parameter activates and deactivates VCs. It also indicates the state of one or more VCs.

active Use this value to activate a VC. The NetVX™ locks all configuration parameters associated with an active VC.

```
ex:cfg slot.3/atm/vc.4 rowstate=active
```

inactive Use this value to deactivate a VC. The NetVX™ allows changes to configuration parameters associated with an inactive VC.

```
ex:cfg slot.3/atm/vc.4 rowstate=inactive
```

Note: Use the first example below to read the state of all VCs on an ATM module in a specific slot (slot 4 shown as an example). Use the second example to read the state of all VCs in the system.

```
ex:cfg slot.4/atm/vc.*
ex:cfg slot.*/atm/vc.*
```

Intro/Update: 2.0.0/2.0.0

cfg slot.s/atm/vc.m **rxrate**

Value(s): 0.00, 0.01 to 155.00 (Mbps, 3.2 fixed format)

Description: Use this command to specify the maximum bandwidth that the ATM module should allow through this VC and onto the backplane. The specified rate includes ATM cell header overhead. If this VC is a multicast source (aka: operating as a source for more than one cross connection), then backplane bandwidth consumption is simply the rate specified multiplied by the number of multi-casts.

0 Disables input policing.

0.01–155.00 Polices data input at the specified rate. Excess data are dropped.

Note: See Table 26.5, "ATM Standards and Rate Calculations" on page 461 for details.

Intro/Update: 2.0.0/6.5.0

cfg slot.s/atm/vc.m **tag**

Value(s): Any text string up to 31 characters.

Description: Specifies a name for this ATM VC.

Note: See Section 22.6, "Overview of NetVX™ Tags" on page 159.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/atm/vc.m **txpriority**

Value(s): high, medium, low

Description: Specifies the output priority for ATM traffic shaping. An ATM interface has three output queues, one each for high, medium, and low priority traffic. When an interface is ready to transmit a cell, it scans the queues from high to low priority, looking for a ready cell. Higher priority cells always pre-empt lower priority data. If no cells are in any of the three queues, the interface sends an idle cell.

high High priority data have the lowest latency. Typically, MPEG streams would use high priority, minimizing latency and improving jitter behavior.

medium Medium priority payload should be able to tolerate some network jitter. The interface itself will have enough bandwidth to carry the data, but the outgoing cells may have not get their preferred time slots, causing more cell delay variation than high-priority traffic. Typically, ATM payload (non-MPEG) would use medium priority.

low The interface uses low priority data to fill the “gaps” in the outgoing bit stream. This value is appropriate for opportunistic data with little or no latency requirements. IP traffic typically uses low-priority on video networks.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/atm/vc.m **txrate**

Value(s): 0.00 to 155.00 (Mbps, 3.2 fixed format)

Description: Output payload data rate. This parameter is used to set the MPEG output rate for purposes of NULL packet insertion. Proper adjustments should be made for setting the multiplex rate.

Note: See Table 26.5, "ATM Standards and Rate Calculations" on page 461 for details.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/atm/vc.m **vcdeg**

Value(s): enable, disable

Description: Enables or disables degrade alarms for this VC.

Note: Use the cfg sys/alm vcDegSev command to set this alarm’s severity level.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/atm/vc.m **vcflt**

Value(s): enable, disable

Description: Enables or disables fault alarms for this VC.

Note: Use the cfg sys/alm vcFaultSev command to set this alarm’s severity level.

Intro/Update: 6.5.0/6.5.0

cfg slot.s/atm/vc.m **vci**

Value(s): 0 to 65535

Description: Set the VC's Virtual Channel Identifier (VCI). This value must be unique amongst all VCs on a given interface.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/atm/vc.m **vpi**

Value(s): 0 to 255

Description: Set the VC's Virtual Path Identifier (VPI).

Intro/Update: 2.0.0/2.0.0

23.1.6 DEC Configuration Parameters

cfg slot.s/dec.m/pgm

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dec.m m = Decoder number. Only option is "1" on the DEC-S11. Therefore this may be omitted altogether in command lines – see examples.

Use these configuration parameters in to modify decoder program settings.

cfg slot.s/dec.m/pgm **bissesw**

Value(s): <none>, <string>

Description: Specifies the Basic Interoperable Scrambling System (BISS) Encrypted Session Word. An encrypted session word should be set to a 16-character, hexadecimal string (upper-case and lower-case letters allowed), such as 0a3b5c7d9e1fe345.

Setting the Encrypted Session Word triggers a new computation of the decoder's Clear Session Word. The Clear Session Word is derived from the combination of the decoder's Injected Identifier and Encrypted Session Word. Once this computation occurs, the derived value is stored in the decoder's Clear Session Word, as if it had been set directly.

<none> When no BISS scrambling is desired (or allowed), this value may be the empty string.

<string> Specifies the Session Word; a 16-character, hexadecimal string, such as 0a3b5c7d9e1fe345 (upper-case and lower-case letters allowed).

Note 1: Setting to the Encrypted Session Word to the empty string has no effect on the clear Session Word.

The decoder protects its Encrypted Session Word. Although the value may be written, attempts to read the value receive the 12-character string **********.

Note 2: As a special case, this same value may be written to the variable without error and without triggering computation of a new clear session word.

Intro/Update: 5.7.0/5.7.0

cfg slot.s/dec.m/pgm **bissid**

Value(s): <none>, <string>

Specifies the Basic Interoperable Scrambling System (BISS) Injected Identifier. When no BISS Mode E descrambling is desired, this value may be the empty string. The decoder protects its injected identifier. Although the value may be written, attempts to read the value receive the 14-character string **********. As a special case, this value may be written to the variable without error and without altering the existing injected identifier.

<none> When no BISS scrambling is desired (or allowed), this value may be the empty string.

<string> Specifies the 14-character Injected Identifier. This identifier may be a hexadecimal string such as 0a3b5Q7d9e1fZ6 (upper-case and lower-case letters allowed). The identifier, combined with the encrypted session word, lets the decoder derive the clear session word.

Note: This hexadecimal string does not require an “0x” prefix.

Intro/Update: 5.7.0/5.7.0

cfg slot.s/dec.m/pgm **bisssw**

Value(s): <none>, <string>

Description: Specifies the Basic Interoperable Scrambling System (BISS) Session Word, also know as the ‘Clear Session Word’. The decoder protects its Session Word. Although the value may be written, attempts to read the value receive the 12-character masked string **********. This value may be written to the variable without error and without altering the existing clear session word. The Session Word behaves like “normal” configuration values. Loading an internal stored configuration or a stored profile does alter session words for the system's decoders. Additionally, a Session Word follows the active service during module failover and failback.

When using BISS Mode E, the decoder uses an identifier and an Encrypted Session Word to derive this clear session word. Consequently, the decoder's Session Word value can be changed indirectly by setting the Encrypted Session Word.

<none> When no BISS descrambling is desired, this value may be the empty string.

<string> To enable descrambling, this session word should be set to a 12-character, hexadecimal string, such as 0a3b5c7d9e1f (upper-case and lower-case letters allowed).

Note 1: If the decoder receives scrambled input but does not have a decryption key, it asserts an Decryption Error alarm. See the "MPEG Decoder Degrade - Decryption Error" command on page 430 for details. alarm.

Note 2: If the decoder receives scrambled video or audio input but does not have the right decryption key, its “descrambled” audio or video will look garbled. Under this circumstance, the decoder increments its video and audio decoder error counters: stat slot.s/dec.m/vid decerr, stat slot.s/dec.m/aud.n decerr. These counters, in turn periodically trigger either video or audio decode errors.
See the "MPEG Decoder Degrade - Video Decode Errors" command on page 430.
See the "MPEG Decoder Degrade - Audio Decode Errors" command on page 428.

Note 3: If any constraints are violated when the module is enabled, then the Module Wrong Type alarm is raise. See the "Module Degrade - Module Wrong Type" command on page 432.

Note 4: A violation also can occur when the system evaluation timer expires.

Intro/Update: 5.7.0/5.7.0

cfg slot.s/dec.m/pgm **decDeg**

Value(s): enable, disable

Description: Controls decoder degrade alarm notification.

Note: Use the cfg sys/alm decDegSev command to set this alarm’s severity level.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/dec.m/pgm **reference**

Value(s): on, off

Description: Specifies the reference signal operation. Given a composite reference input, the decoder can synchronize its output to the reference signal. This can be useful in a studio to enable frame-accurate operations. When the decoder is using the system's reference signal, the frame rates for its configured video standard, the reference signal, and the incoming MPEG stream should match. If the values do not match (such as a PAL reference signal combined with NTSC output video), the decoder will assert an alarm (MPEG Decoder Degrade - Video Decode Errors). If this decoder is not using the reference signal (off), only the video standard and the MPEG stream must match.
To synchronize its output with the reference signal, a decoder must occasionally skip or repeat frames. This does not work when the decoder passes compressed audio without decoding it. Consequently, audio passthrough and the reference signal should not be enabled at the same time. The decoder asserts an alarm (Module Degrade - Configuration Error) if it encounters this mis-configuration.

on The decoder locks its output to the system's reference signal. It can skip or repeat frames as needed to maintain synchronization between its generated output and the reference signal.

off The decoder ignores the system's reference signal. It generates output based solely on its MPEG input, without repeating or skipping frames.

Intro/Update: 6.5.0/6.5.0

cfg slot.s/dec.m/pgm **prognum**

Value(s): 0, 1 to 65535

Description: Identifies the number of the program this decoder should decode.

0 Decode the first program listed in the MPEG-2 transport stream's Program Allocation Table (PAT).

1 to 65535 Specifies the program to decode.

Intro/Update: 2.0.0/7.0.0

cfg slot.s/dec.m/pgm **tag**

Value(s): Any text string up to 31 characters.

Description: Specifies a name for this decoder.

Note: See Section 22.6, "Overview of NetVX™ Tags" on page 159.

Intro/Update: 2.0.0/2.0.0

23.1.7 DEC Audio Configuration Parameters

cfg slot.s/dec.m/aud.n

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dec.m m = Decoder number. Only option is "1" on the DEC-S11. Therefore this may be omitted altogether in command lines – see examples.

aud.n n = Audio channel number (1–7).
- 1–2 Primary and secondary audio channels.
- 3* The ENC-H11 and ENC-A21 provide a third audio channel.
- 3–7 * Associated audio channels.

Note: * Availability of this selection is determined by the module's feature profile.
See Table 19-5, "DEC-S11 Module Type Definitions" on page 142. See also util key .

Use these configuration parameters in to modify decoder audio settings.

cfg slot.s/dec.m/aud.n **channel**

Value(s): 0, 1 to 65535

Description: Specifies which audio channel (PMT entry) in the transport stream this audio decoder should decode.

0 The decoder selects the audio channel in the PMT that this audio decoder should decode.

1 to 65535 Decodes the audio channel matching the specified PMT audio entry.

Note 1: Each audio decoder must decode a unique audio channel.

Note 2: The specified audio channel must exist in the transport stream. For example, if the selected PMT entry is 3, the PMT should contain at least 3 audio entries.

Note 3: The decoder declares an alarm (audDeg, no audio) if any of the above constraints are violated.

Intro/Update: 6.5.1/6.5.1

cfg slot.s/dec.m/aud.n **delay**

Value(s): -500 to +500 msec.

Description: Sets the amount of audio delay relative to video.

Intro/Update: 2.0.0/4.0.0

cfg slot.s/dec.m/aud.n **outlvl**

Value(s): pro18, pro20, pro24

Description: Specifies the full-scale analog output level. When generating analog audio, the decoder uses one of the following output levels.

pro18 Professional audio with a full-scale output level of 18 dBu.

pro20 Professional audio with a full-scale output level of 20 dBu.

pro24 Professional audio with a full-scale output level of 24 dBu.

Intro/Update: 5.0.0/5.0.0

cfg slot.s/dec.m/aud.n **passthrough**

Value(s): enable, disable

Description: Use this command to control whether or not the decoder should decode audio.

enable The decoder passes compressed audio through to its digital and embedded outputs as recommended by IEC 61937. This option only works for AC-3.

disable The decoder itself decompresses audio and provides it to its digital. embedded, and audio outputs.

Note 1: The audio source (described below) must be set to “stream”.

Note 2: Audio must be encoded using AC-3 to be passed through.

Intro/Update: 2.2.0/4.0.0

cfg slot.s/dec.m/aud.n **source**

Value(s): stream, mute, tone-left, tone-right, tone-both

Description: Specifies the audio source.

stream Decodes the audio stream in the specified program.

mute Mutes audio output.

*tone-** Provides tone on the specified channel(s).

Intro/Update: 2.0.0/4.0.0

23.1.8 DEC Audio Router Configuration Parameters

cfg slot.s/dec.m/aud.n/rtr

slot.s s = Slot number.
- 3–17 SYS-1700’s range of application module slot numbers.
- 2–4 SYS-200/SYS-300’s range of application module slot numbers.

dec.m m = Decoder number. Only option is “1” on the DEC-S11. Therefore this may be omitted altogether in command lines – see examples.

aud.n n = Audio channel number (1–7).
- 1–2 Primary and secondary audio channels.
- 3* The ENC-H11 and ENC-A21 provide a third audio channel.
- 3–7* Associated audio channels.

Note: * Availability of this selection is determined by the module’s feature profile.
See Table 19-5, "DEC-S11 Module Type Definitions" on page 142. See also util key .

Use these configuration parameters to modify decoder audio router settings.

cfg slot.s/dec.m/aud.n/rtr **in**

Value(s): 1–n (n = the number of router inputs)

Description: Specifies the audio router (input) port receiving its signal directly from the DEC-S11. Example: On a 12x1 router, valid values for this item would range from 1 to 12.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/dec.m/aud.n/rtr **lvl**

Value(s): 0 to 15

Description: Specifies the router level to associate with this signal.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/dec.m/aud.n/rtr **out**

Value(s): 1–n (n = the number of router outputs)

Description: Specifies the router (output) port connected directly to equipment receiving decoded audio. Example: On a 12x1 router, “1” is the only valid “out” value.

Intro/Update: 2.2.0/3.3.0

23.1.9 DEC VBI Configuration Parameters

cfg slot.s/dec.m/vbi *

* Availability of this selection is determined by the module’s feature profile.
See Table 19-5, "DEC-S11 Module Type Definitions" on page 142. See also util key .

slot.s s = Slot number.
- 3–17 SYS-1700’s range of application module slot numbers.
- 2–4 SYS-200/SYS-300’s range of application module slot numbers.

dec.m m = Decoder number. Only option is “1” on the DEC-S11. Therefore this may be omitted altogether in command lines – see examples.

Use this configuration parameter to modify for alarm notification.

cfg slot.s/dec.m/vbi * **vbideg**

Value(s): enable, disable

Description: VBI Degrade Alarm Enable.

Note: Use the cfg sys/alm vbiDegSev command to set this alarm’s severity level.

Intro/Update: 4.0.0/4.0.0

23.1.10 DEC VBI Line and Field Decoder Configuration Parameters

cfg slot.s/dec.m/vbi/fld.f/lin.l

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dec.m m = Decoder number. Only option is "1" on the DEC-S11. Therefore this may be omitted altogether in command lines – see examples.

fld.f f = Field number (1–2)
- 1 Video field 1.
- 2 Video field 2.

lin.l l = Line number (5–22; 273–285) See Table 23-8, "VBI Field and Line Number Setting Constraints" on page 221 for more details.

Use these configuration parameters to modify decoder VBI settings.

cfg slot.s/dec.m/vbi/fld.f/lin.l **override**

Value(s): black, coded, dvitc, none, testPattern

Description: Specifies what the decoder should do with VBI data it receives for the specified field and line.

none Specifies that the decoder does not insert a signal to override what is on the VBI line.

black The decoder ignores data sent by the encoder and inserts black on this VBI line.

* *coded* Insert decoded MPEG video on this VBI line. If the encoded MPEG video signal does not contain this VBI line, the decoder uses black. An encoder would need to be using an "Extended 720 Resolution" to put video VBI lines in the stream.

* *testpattern* The decoder ignores data sent by the encoder and inserts the specified test pattern (specified by command below).

Note 1: * Availability of this selection is determined by the module's feature profile.

Note 2: See Table 19-5, "DEC-S11 Module Type Definitions" on page 142. See also util key .

Intro/Update: 4.0.0/4.0.0

cfg slot.s/dec.m/vbi/fld.f/lin.l **testPattern**

Value(s): none, ntsc-75colorbars, ntsc-100colorbars, ntsc-combination, ntsc-composite, ntsc-eq, ntsc-flat, ntsc-pll, ntsc-ramp, ntsc-sinx, pal-ccir17, pal-ccir18, pal-ccir330, pal-ccir331, pal-75colorbars, pal-100colorbars, pal-eq, pal-its1, pal-its2, pal-flat, pal-pll, pal-ramp, pal-sinx

Description: Specifies a test pattern to insert on the specified field and line VBI processing. This setting requires the override control (above) to be set to "test pattern".

Note 1: * Availability of this selection is determined by the module's feature profile.

Note 2: See Table 19-5, "DEC-S11 Module Type Definitions" on page 142. See also util key .

Intro/Update: 4.0.0/5.2.0

cfg slot.s/dec.m/vbi/fld.f/lin.l **videoindex**

Description: Specifies the handling of video index information. When the transport stream carries aspect ratio information, the decoder can use that information to insert video index information into the output signal.

auto The decoder extracts data from the transport stream to reconstruct the video index: an Active Format Description (AFD) (if present) and the aspect ratio from the picture header. Depending on the output video standard, video index information is inserted on VBI line 14 for NTSC or line 11 for PAL.

none This value disables video index reconstruction in the output signal. An encoder can use any of the following sources for this information (1) Wide screen signaling from VBI lines. (2) Video index from the input signal. (3) Configured aspect ratio.

After processing an input signal, the encoder would construct the transport stream with an aspect ratio in the picture header and (perhaps) an Active Format Description (AFD). The decoder uses that information to guide its video index insertion.

Note: The decoder cannot currently reconstruct a VBI line with coded video and simultaneously insert video index information. To preserve the coded video, select 'none' to disable video index insertion. Otherwise, the decoder inserts a black VBI line carrying video index information.

Intro/Update: 7.2.0/7.2.0

23.1.11 DEC Video Configuration Parameters

cfg slot.s/dec.m/vid

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dec.m m = Decoder number. Only option is "1" on the DEC-S11. Therefore this may be omitted altogether in command lines – see examples.

Use these configuration parameters to modify decoder video settings.

cfg slot.s/dec.m/vid **aspect**

Value(s): black, nosync, osdstatus, still

Description: Specifies the output video monitor aspect ratio. Depending on video capture equipment (cameras, format converters, encoders, etc.), a video stream has a "natural" aspect ratio. Though not required, this value can be indicated in the MPEG stream to help display the video without distortion. The decoder's aspect ratio value specifies the output monitor's aspect ratio, allowing the decoder to adapt the input video to the display device.

aspect-4x3 The monitor's aspect ratio is 4x3. If the input image is 16x9 it will appear distorted.

aspect-16x9 The monitor's aspect ratio is 16x9. If the input image is 4x3, all lines are displayed but their edges are trimmed.

auto-4x3 Automatically detects the aspect ratio from the source. If that value is not available, uses 4x3.

auto-16x9 Automatically detects the aspect ratio from the source. If that value is not available, uses 16x9.

unknown The monitor's aspect ratio is unspecified. The image is not converted in any way. The image's appearance depends on the input and the physical monitor. However this selection should be used if the received signal is PAL format and contains WSS on line 23. In this case the material will be presented by the monitor as intended.

Note 1: An Active Format Description (AFD) carries information about the picture, in addition to the aspect ratio. Decoders can use the AFD to match the stream's video to display characteristics, or to insert video index information in the outgoing signal. When a stream carries AFD, many decoders use that information exclusively, ignoring the decoder's configuration specific to the attached display. This can cause undesirable results, if the actual aspect ratio of the encoder's video input does not match the aspect ratio configured for the encoder.

Note 2: When the fixed aspect ratios (aspect-4x3, aspect-16x9) are used, the encoder does not emit AFD. In case of a mismatch between the encoder input and the configured aspect ratio, the decoder's display properties are allowed to take priority. By contrast, the automatic ratios (auto-4x3, auto-16x9) examine the input for aspect ratio information (through WSS and video index) and use that to build the AFD. If dynamic information is unavailable, the automatic ratios insert an AFD appropriate for the configured ratio.

Intro/Update: 5.7.0/7.2.0

cfg slot.s/dec.m/vid **noInput**

Value(s): black, noSync, osdstatus, still

Description: Specifies how the decoder should respond to a loss of video input.

black The decoder generates sync and displays a black screen.

nosync The decoder stops generating a sync signal.

osdstatus The decoder presents the OSD status display regardless of whether or not it was enabled.

still The decoder displays the last picture successfully decoded. The decoder displays black if no picture is available.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/dec.m/vid **offset**

Value(s): -2 to 0 to +2

Description: Indicates the line offset setting. This setting offsets the first line of decoded video and does not affect VBI line settings. 0 = line 22 (normal) line 7 (extended)

-2 Encoded video begins on line 20. This setting makes the image on a monitor shift upward two lines from the default.

-1 Encoded video begins on line 21. This setting makes the image on a monitor shift upward one line from the default.

0 Encoded video begins on line 22. This setting is the default.

1 Encoded video begins on line 23. This setting makes the image on a monitor shift down one line from the default.

2 Encoded video begins on line 24. This setting makes the image on a monitor shift down two lines from the default.

Intro/Update: 2.0.0/7.0.0

cfg slot.s/dec.m/vid **osd**

Value(s): enable, disable

Description: Overall control of the OSD display.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/dec.m/vid **osdname**

Value(s): enable, disable

Description: Display program name from stream.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/dec.m/vid **osdpattern**

Value(s): none, ntsc-75colorbars, ntsc-100colorbars, ntsc-combination, ntsc-composite, ntsc-eq, ntsc-flat, ntsc-pll, ntsc-ramp, ntsc-sinx, pal-ccir17, pal-ccir18, pal-ccir330, pal-ccir331, pal-75colorbars, pal-100colorbars, pal-eq, pal-its1, pal-its2, pal-flat, pal-pll, pal-ramp, pal-sinx

Description: Controls the full-screen, on-screen display (OSD) test pattern.

Intro/Update: 2.0.0/5.2.0

cfg slot.s/dec.m/vid **osdStat**

Value(s): enable, disable

Description: Controls the on-screen display of program status.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/dec.m/vid **osdtext**

Value(s): string

Description: Display 80 character text string, including empty string

Intro/Update: 2.0.0/2.0.0

cfg slot.s/dec.m/vid **standard**

Value(s): ntsc-j, pal-m, ntsc, pal, auto

Description: Sets the video decoder standard.

Auto Selects NTSC or PAL based on frame rate.

Intro/Update: 2.0.0/5.0.0

23.1.12 DEC Video Router Input Configuration Parameters

cfg slot.s/dec.1/vid/rtr

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dec.m m = Decoder number. Only option is "1" on the DEC-S11. Therefore this may be omitted altogether in command lines – see examples.

Use these configuration parameters to modify decoder video router settings.

cfg slot.s/dec.1/vid/rtr **in**

Value(s): 1–n (n = the number of router inputs)

Description: Specifies the router (input) port receiving its signal directly from the decoder. Example: On a 12x1 router, valid values for this item would range from 1 to 12.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/dec.1/vid/rtr **lvl**

Value(s): 1–n (n = the number of router levels)

Description: Specifies the router level to associate with this signal.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/dec.1/vid/rtr **out**

Value(s): 1–n (n = the number of router outputs)

Description: Specifies the router (output) port connected directly to equipment receiving decoded video. Example: On a 12x1 router, "1" is the only valid "out" value.

Intro/Update: 2.2.0/3.3.0

23.1.13 ENC Audio Encoder Configuration Parameters

cfg slot.s/enc.m/aud.n

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

aud.n n = Audio channel number (1–7).
- 1–2 Primary and secondary audio channels.
- 3* The ENC-H11 and ENC-A21 provide a third audio channel.
- 3–7 * Associated audio channels.

Note: * Availability of this selection is determined by the module's feature profile.
See Table 19-5, "DEC-S11 Module Type Definitions" on page 142. See also util key .

Use these configuration parameters to modify audio encoding settings.

cfg slot.s/enc.m/aud.n **auddeg**

Value(s): enable, disable
Description: Enables audio degrade alarms.
Note: Use the cfg sys/alm audDegSev command to set this alarm's severity level.
Intro/Update: 2.0.0/2.0.0

cfg slot.s/enc.m/aud.n **audflt**

Value(s): enable, disable
Description: Enables audio fault alarms.
Note: Use the cfg sys/alm audFltSev command to set this alarm's severity level.
Intro/Update: 2.0.0/2.0.0

cfg slot.s/enc.m/aud.n **channel**

Value(s): 0, 1 to 65535
Description: Specifies the audio channel (PMT entry) to create in the transport stream.
0 The encoder selects the PMT entry to assign to this audio stream.
1 to 65535 The encoder inserts this audio stream into the specified PMT audio entry.
Note 1: A unique PMT audio entry must be specified for each audio channel on a given encoder.
Note 2: The encoder's selected PMT audio entries must be contiguous.
Note 3: The combination of explicit assignments (non-zero values) and implicit assignments (zero values) should select all entries from 1 to the number of audio streams in the program.
Note 4: The encoder declares an alarm (audDeg, configuration error) if any of the above constraints are violated.
Intro/Update: 6.5.0/6.5.1

cfg slot.s/enc.m/aud.n **delay**

Value(s): -500 to +500 msec.

Description: Sets the amount of audio delay relative to video.

-500 to -1 Settings in this range cause the audio signal to precede the video signal. Use a value in this range to synchronize audio and video when using an external audio encoder. The best negative delay value to use is the one that most closely approximates the external audio encoder's end-to-end processing time.

0 No audio delay is applied.

1 to 500 Settings in this range cause the audio to trail the video signal.

Intro/Update: 2.0.0/7.2.0

cfg slot.s/enc.m/aud.n **embedchan**

Value(s): 1 to 2

Description: Identifies the embedded audio channel providing audio to the encoder.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/enc.m/aud.n **embedgroup**

Value(s): 1 to 4

Description: Identifies the embedded audio group containing the embedded audio channel (above).

Intro/Update: 2.2.0/3.3.0

cfg slot.s/enc.m/aud.n **gain**

Value(s): -80.0 to 40.0 (dB)

Description: Specifies the amount of gain to apply to the audio input.

Note: This feature is ignored when the audio standard (cfg slot.s/enc.m/aud.n standard) is set to any of the "extComp..." selections.

Intro/Update: 2.0.0/4.1.0

cfg slot.s/enc.m/aud.n **inlvl**

Value(s): consumer, pro18, pro20, pro24

Description: Use this command to specify the analog input level.

Consumer Use this setting to receive input from consumer audio gear such as CD and DVD players. Input, when using this setting, should be between -10dBV or -7.8 dBu (nominal) and +10 dBV or 12.2 dBu (full scale).

pro18 Use this setting to receive input from DVB-compliant studio gear. Input, when using this setting, should be between +4 dBu (nominal) and +18 dBu (full scale).

pro20 Use this setting to receive input from Sony SDIF equipment.
This audio input level is not recommended. When using this setting, the Input should be between +4 dBu (nominal) and +20 dBu (full scale).

pro24 Use this setting for typical U.S. professional audio equipment. When using this setting, the Input should be between +4 dBu (nominal) and +24 dBu (full scale).

Note: The encoder's 'simode' (cfg slot.s/enc.m/pgm simode) setting may affect this parameter.

Intro/Update: 2.0.0/5.5.0

cfg slot.s/enc.m/aud.n **input**

Value(s): analog, embedded, mute, tone, audio

Description: Identifies the audio encoder's source.

analog Selects the analog audio input. The signal is digitized and encoded into the stream.

** digital* Selects the digital audio interface.

embedded Selects an embedded audio group from the SDI (serial digital interface) video input. Embedded audio data are structured as groups of stereo pairs, following SMPTE 272M. The suffixes A, B, and C refer to the following levels.
* Level A, SMPTE 272M-A. Synchronous audio at 48 KHz, 20-bit samples.
* Level B, SMPTE 272M-AB. Synchronous audio at 48 KHz, sample distribution to allow extended data packets, but ignoring the extended data.
* Level C, SMPTE 272M-ABC. Synchronous audio at 48 KHz, audio and extended data packets.
NetVX™ expects embedded audio to use 48 KHz samples, synchronous to video. If embedded audio carries other contents, the encoder asserts the "Format Not Supported" fault.

mute Encodes silence as the audio. The audio is still present in the MPEG stream, but it transmits silence. Audio also can be removed from the stream entirely by setting the state appropriately.

tone Encodes a test tone as the audio.

auto This value tells the encoder to dynamically determine the audio input to use. When acquiring the audio signal, the encoder first looks for digital audio input. Failing that, it looks for embedded audio. Failing that, it uses the analog input.

Note 1: * Availability of this selection is determined by the module's feature profile.
See the following feature tables for audio encoding support details.
Table 14-6, "ENC-S11 Module Type Definitions" on page 106.
Table 15-6, "ENC-S21 Module Type Definitions" on page 117.
Table 16-2, "ENC-H11 Module Type Definitions" on page 124.
Table 17-2, "ENC-A21 Module Type Definitions" on page 130.
Table 18-2, "AUD-D14 Module Type Definitions" on page 136.

Note 2: See also util key .

Intro/Update: 2.0.0/7.0.0

cfg slot.s/enc.m/aud.n **mode**

Value(s): stereo, dual-mono, mono, parametric-stereo, 5.1

Description: Sets the audio encoding mode.

stereo Encodes stereo audio.

mono Encodes mono audio on the left channel of the stereo pair.

dual-mono Provides two independent mono audio channels, channel A and channel B, instead of stereo left and right.

parametric-stereo Use this setting in conjunction with MPEG-4 encoders for lossy low-bitrate audio encoding.

5.1 Use this setting in conjunction with 5.1 channel surround sound.

Note 1: The following tables enumerate all audio encoder 'Standard' (cfg slot.s/enc.m/aud.n standard) settings and related 'Mode' settings.
Table 23-2, "AC-3 Audio "Standard" and Audio "Mode" Relationships and Bitrates" on page 192.
Table 23-3, "Externally-Compressed Audio "Standard" and Audio "Mode" Relationships and Bitrates" on page 193.
Table 23-4, "MPEG Audio "Standard" and Audio "Mode" Relationships and Bitrates" on page 194.
Table 23-5, "SMPTE 302 Sample Size, Bitrate, and Transport Stream Rate" on page 194.
Table 23-6, "SI/PSI Mode Table Transmission Rates and Other Parameter Constraints" on page 207.

Note 2: The encoder's 'simode' (cfg slot.s/enc.m/pgm simode) setting may affect this parameter.

Intro/Update: 2.0.0/7.3.0

cfg slot.s/enc.m/aud.n **standard**

Value(s): aac-lc-96k, aac-lc-80k, aac-lc-800k, aac-lc-64k, aac-lc-640k, aac-lc-576k, aac-lc-56k, aac-lc-512k, aac-lc-448k, aac-lc-384k, aac-lc-320k, aac-lc-280k, aac-lc-256k, aac-lc-224k, aac-lc-192k, aac-lc-160k, aac-lc-128k, aac-lc-112k
aac-he-96k, aac-he-80k, aac-he-64k, aac-he-56k, aac-he-48k, aac-he-40k, aac-he-32k, aac-he-24k, aac-he-240k, aac-he-224k, aac-he-192k, aac-he-160k, aac-he-128k, aac-he-112k,
ac3-32k, ac3-40k, ac3-48k, ac3-56k, ac3-64k, ac3-80k, ac3-96k, ac3-112k, ac3-128k, ac3-160k, ac3-192k, ac3-224k, ac3-256k, ac3-320k, ac3-384k, ac3-448k, ac3-512k, ac3-576k, ac3-640k
extcomp-192k, extcomp-256k, extcomp-384k, extcomp-448k, extcomp-640k, extcomp-800k, extcomp-2400k
mpeg-96k, mpeg-112k, mpeg-128k, mpeg-160k, mpeg-192k, mpeg-224k, mpeg-256k, mpeg-320k, mpeg-384k
smpte302-2000k, smpte302-2400k, smpte302-2800k

Description: Sets the audio encoder's compression standard and rate.

aac-he-,*
aac-lc-...* Use these selections for AAC encoding. These selections are only available on MPEG-4/H.264 encoders. See Section 23.1.13.1, "HE-AAC, AAC-LC Audio "Standard" and "Mode" Settings" on page 190 for a list of valid values.

ac-3-...* Use these selections for Dolby AC-3 encoding. See Section 23.1.13.2, "AC-3 Audio "Standard" and "Mode" Settings" on page 192 for a list of valid values.

extcomp-...* Use these selections when using an external audio encoder. See Section 23.1.13.3, "Externally-Compressed Audio Settings" on page 193 for a list of valid values.

mpeg-...* Use these selections for MPEG 1 Layer 2 encoding. See Section 23.1.13.4, "MPEG Audio "Standard" and "Mode" Settings" on page 194 for a list of valid values.

smpte-...* Use these selections when using uncompressed AES3 according to SMPTE 302. See Section 23.1.13.5, "SMPTE 302 Audio Settings" on page 194 for a list of valid values.

Note 1: Availability of each value for this parameter is determined by the module's type and feature profile. Not all audio codecs are available on all modules.

Note 2: The encoder's 'simode' (cfg slot.s/enc.m/pgm simode) setting also affects this parameter.

Note 3: Up to two channels can support SMPTE-302 audio.

Note 4: The audio channels on a given module must not be configured to use a mix of AC-3 and MPEG standards. When using the craft port interface to configure this parameter, use the asterisk to set all channels simultaneously.

```
cfg slot.3/enc.1/aud.* standard=ac3-640k
```

Intro/Update: 2.0.0/7.8.0

23.1.13.1 HE-AAC, AAC-LC Audio “Standard” and “Mode” Settings

This section details the range of audio settings provided for use with modules supporting AAC audio encoding.

The quality vs. bit rate relationship between the various AAC audio coding selections can be seen in the Figure 23-1 below.

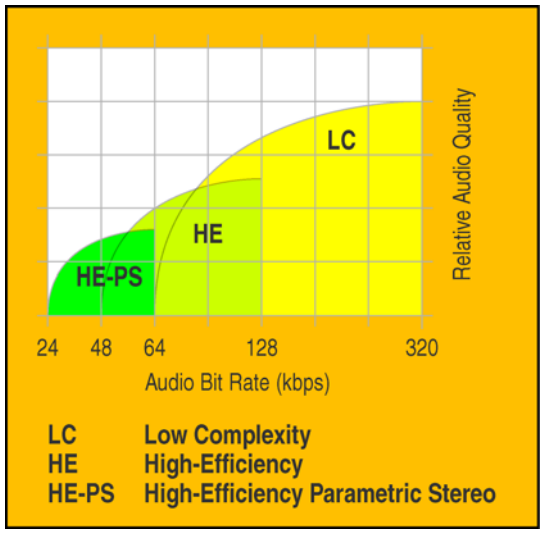


Figure 23-1 Relative Quality Amongst Audio Bitrate and AAC Audio Options

About Table 23-1 below …

- The audio standard is configured using the cfg slot.s/enc.m/aud.n standard command.
- The audio mode is configured using the cfg slot.s/enc.m/aud.n mode command.

Table 23-1 HE-AAC, AAC-LC Audio "Standard" and Audio "Mode" Settings and Bitrates

Possible Audio "Standard" Settings	Possible Audio "Mode" Settings *					Nominal Bit Rate (bps)	Transport Stream Bit Rate (bps) (Includes TS Overhead)	Support by Module					
	Mono	Dual-Mono	Stereo	Parametric Stereo	5.1			ENC-H11	ENC-S21	ENC-S11	ENC-A11	* ENC-A21	AUD-D14
aac-he-24k						24000	29375						
aac-he-32k						32000	35250						
aac-he-40k						40000	41125						
aac-he-48k						48000	52875						
aac-he-56k						56000	60160						
aac-lc-56k						56000	60160						
aac-he-64k						64000	66176						
aac-lc-64k						64000	66176						
aac-he-80k						80000	84224						
aac-lc-80k						80000	84224						
aac-he-96k						96000	102272						
aac-lc-96k						96000	102272						
aac-he-112k						112000	120320						
aac-lc-112k						112000	120320						
aac-he-128k						128000	132352						
aac-lc-128k						128000	132352						
aac-he-160k						160000	164500						
aac-lc-160k						160000	168448						
aac-he-192k						192000	199750						
aac-lc-192k						192000	198528						
aac-he-224k						224000	23500						
aac-lc-224k						224000	234624						
aac-he-240k						240000	246750						
aac-lc-256k						256000	264704						
aac-lc-280k						280000	287875						
aac-lc-320k						320000	330880						
aac-lc-384k						384000	393625						
aac-lc-448k						448000	458250						
aac-lc-512k						512000	528750						
aac-lc-576k						576000	593375						
aac-lc-640k						640000	658000						
aac-lc-800k						800000	822500						

Table 23-1 HE-AAC, AAC-LC Audio "Standard" and Audio "Mode" Settings and Bitrates

Legend	
Supported Feature	
Unsupported Feature	

* The ENC-A21 can process up to three channels of AAC audio.

Note: HE-AAC indicates that Spectral Band Replication is being used.

* HE-AAC Version 1 is used when the audio 'Standard' is set to 'AAC-HE-*' and any of the 'Modes' Mono, Dual-Mono, and Stereo.

* HE-AAC Version 2 is used when the audio 'Standard' is set to 'AAC-HE-*' and the 'Mode' is set to 'Parametric Stereo'.

23.1.13.2 AC-3 Audio "Standard" and "Mode" Settings

This section details the range of audio settings provided for use with modules supporting AC-3 audio encoding.

- The audio standard is configured using the cfg slot.s/enc.m/aud.n standard command.
- The audio mode is configured using the cfg slot.s/enc.m/aud.n mode command.

Table 23-2 AC-3 Audio "Standard" and Audio "Mode" Relationships and Bitrates

Possible Audio "Standard" Settings	Possible Audio "Mode" Settings		Nominal Bit Rate (bps)	Transport Stream Bit Rate (bps) (Includes TS Overhead)	Support by Module					
	Mono	Stereo			ENC-H11	ENC-S21	ENC-S11	ENC-A11	ENC-A21*	AUD-D14
ac3-56k			56000	58751						
ac3-64k			64000	67143						
ac3-80k			80000	82251						
ac3-96k			96000	99223						
ac3-112k			112000	114889						
ac3-128k			128000	131601						
ac3-160k			160000	164501						
ac3-192k			192000	197401						
ac3-224k			224000	229778						
ac3-256k			256000	263201						
ac3-320k			320000	329001						
ac3-384k			384000	393626						
ac3-448k			448000	458251						
ac3-512k			512000	523715						
ac3-576k			576000	590112						
ac3-640k			640000	658001						

Legend	
Supported Feature	
Unsupported Feature	

* The ENC-A21 can process up to three channels of AC-3 audio.

23.1.13.3 Externally-Compressed Audio Settings

This section details the range of audio settings provided for use with external audio encoders. The audio standard is configured using the cfg slot.s/enc.m/aud.n standard command. The audio mode is ignored for these standard settings.

Table 23-3 Externally-Compressed Audio "Standard" and Audio "Mode" Relationships and Bitrates

Possible Audio "Standard" Settings	Possible Audio "Mode" Settings	Nominal Bit Rate (bps)	Transport Stream Bit Rate (bps) (Includes TS Overhead)	Support by Module					
				ENC-H11	ENC-S21	ENC-S11	ENC-A11	ENC-A21	AUD-D14
extcomp-192k	N/A	192000	198445						
extcomp-256k	N/A	256000	263201						
extcomp-384k	N/A	384000	393626						
extcomp-448k	N/A	448000	458251						
extcomp-640k	N/A	640000	658001						
extcomp-800k Use this setting for externally--compressed AAC 5.1.	N/A	800000	822500						
extcomp-2400k or Dolby-E Use this setting with external Dolby-E encoders	N/A	2400000	2419200						

Legend	
Supported Feature	
Unsupported Feature	

23.1.13.4 MPEG Audio "Standard" and "Mode" Settings

This section details the range of audio settings provided for use with modules supporting MPEG audio encoding.

- The audio standard is configured using the cfg slot.s/enc.m/aud.n standard command.
- The audio mode is configured using the cfg slot.s/enc.m/aud.n mode command.

Table 23-4 MPEG Audio "Standard" and Audio "Mode" Relationships and Bitrates

Possible Audio "Standard" Settings	Possible Audio "Mode" Settings			Nominal Bit Rate (bps)	Transport Stream Bit Rate (bps) (Includes TS Overhead)	Support by Module					
	Mono	Dual-Mono	Stereo			ENC-H11	ENC-S21	ENC-S11	ENC-A11	ENC-A21	AUD-D14
mpeg-32k				32000	34182						
mpeg-48k				48000	50134						
mpeg-56k				56000	62667						
mpeg-64k				64000	67889						
mpeg-80k				80000	83556						
mpeg-96k				96000	99223						
mpeg-112k				112000	114889						
mpeg-128k				128000	131601						
mpeg-160k				160000	164501						
mpeg-192k				192000	198445						
mpeg-224k				224000	229778						
mpeg-256k				256000	262061						
mpeg-320k				320000	329001						
mpeg-384k				384000	393091						

Legend	
Supported Feature	
Unsupported Feature	

* The ENC-A21 can process up to three channels of MPEG audio.

23.1.13.5 SMPTE 302 Audio Settings

This section details the range of audio settings provided for use with SMPTE-302-compliant audio input. The audio standard is configured using the cfg slot.s/enc.m/aud.n standard command. The audio mode is ignored for these standard settings.

Table 23-5 SMPTE 302 Sample Size, Bitrate, and Transport Stream Rate

Standard	Possible Audio "Mode" Settings	Sample Width	Nominal Bit Rate (bps)	Transport Stream Bit Rate (bps) (Includes TS Overhead)	Support by Module					
					ENC-H11	ENC-S21	ENC-S11	ENC-A11	ENC-A21	AUD-D14
smpte302-2000k	N/A	16 bits	1920000	2016000 bps						
smpte302-2400k	N/A	20 bits	2304000	2419200 bps						
smpte302-2800k	N/A	24 bits	2688000	2822400 bps						

Table 23-5 SMPTE 302 Sample Size, Bitrate, and Transport Stream Rate

Legend	
Supported Feature	
Unsupported Feature	

cfg slot.s/enc.m/aud.n **state**

Value(s): enable, disable

Description: Use this control to enable or disable the specified audio channel.

enable * Specified audio channel is added to the stream.

disable Specified audio channel is not added to the stream.

Note: * Availability of this selection is determined by the module's feature profile.
See Table 14-6, "ENC-S11 Module Type Definitions" on page 106. See also util key .

Intro/Update: 2.0.0/4.0.0

23.1.14 ENC Advanced Audio Encoder Configuration Parameters

cfg slot.s/enc.m/aud.n/adv

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

aud.n n = Audio channel number (1–7).
- 1–2 Primary and secondary audio channels.
- 3* The ENC-H11 and ENC-A21 provide a third audio channel.
- 3–7 * Associated audio channels.

Note: * Availability of this selection is determined by the module's feature profile.
See Table 19-5, "DEC-S11 Module Type Definitions" on page 142. See also util key .

Use these configuration parameters to modify advanced encoder audio settings.

cfg slot.s/enc.m/aud.n/adv **aacpssignalling**

Value(s): auto, explicit, implicit

Description: Use this parameter to specify the type of parametric stereo signaling for AAC audio encoding.

auto This value instructs the encoder to select the SBR signaling that is most appropriate based on the program's SI-Mode (cfg slot.s/enc.m/pgm simode).
When the SI-Mode is set to 'atsc-mph', this option (auto) sets this parameter to 'Explicit'.
When the SI-Mode is set to anything other than 'atsc-mph', this option (auto) sets this parameter to 'Implicit'.

explicit This value explicitly indicates parametric stereo signaling in the audio stream.

implicit This value implicitly signals parametric stereo in the stream.

Note: This parameter is applicable only when the audio standard (cfg slot.s/enc.m/aud.n standard) is set to one of the 'aac-he-*' values.

Intro/Update: 8.1.0/8.1.0

cfg slot.s/enc.m/aud.n/adv **aactransport**

Value(s): auto*, adts, loas

Description: Use this parameter to specify the audio `stream_type` field in the PMT and the audio encapsulation format used for the stream.

auto This setting is dependent upon the standard (cfg slot.s/enc.m/aud.n standard) setting.
If the 'standard' is set to 'AAC-LC*...' then this parameter defaults to 'ADTS'.
If the 'standard' is set to 'HE-AAC*...' then this parameter defaults to 'loas'.

adts This setting specifies 'Audio Data Transport Stream'. This setting is typically used with AAC-LE-formatted audio.

loas This setting specifies 'Low Overhead Audio Stream'. This setting is typically used with HE-AAC-formatted audio.

Note: This feature is only applicable when the audio standard (cfg slot.s/enc.m/aud.n standard) is set to any of the "AAC..." selections.

Intro/Update: 7.3.0/7.3.0

cfg slot.s/enc.m/aud.n/adv **aacversion**

Value(s): auto*, mpeg-2, mpeg-4,

Description: Some decoders have difficulty processing MPEG-4 HE-AAC audio; use this parameter to specify an 'AAC-LC' alternative.

auto This option effectively uses the 'MPEG-4' selection below.

mpeg-2 The audio standard (cfg slot.s/enc.m/aud.n standard) setting affects this option in the following manner.
If the audio standard is set to 'AAC-LC' then the 'MPEG-2 AAC-LC' format is used.
If the audio standard is set to 'AAC-HE' then the 'MPEG-2 AAC-LC + SBR' format is used.

mpeg-4 The audio standard (cfg slot.s/enc.m/aud.n standard) setting affects this option in the following manner.
If the audio standard is set to 'AAC-LC' then the 'MPEG-4 AAC-LC' format is used.
If the audio standard is set to 'AAC-HE' then the 'MPEG-4 AAC-LC + SBR' format is used.

Note 1: This feature is only applicable when the audio standard (cfg slot.s/enc.m/aud.n standard) is set to any of the 'AAC...' selections.

Note 2: The 'MPEG-2' option is not valid when the standard (cfg slot.s/enc.m/aud.n standard) is set to 'AAC...' and the mode (cfg slot.s/enc.m/aud.n mode) is set to 'parametric-stereo'.

Intro/Update: 7.3.0/7.3.0

cfg slot.s/enc.m/aud.n/adv **aacsbrsignaling**

Value(s): auto*, explicit-hier, implicit

Description: This parameter provide two options for signaling the presence of SBR data in the audio stream.

auto If the simode (cfg slot.s/enc.m/pgm simode) is set to 'isdb-tb-fixed' or 'isdb-tb-mobile' then 'explicit-hier' is used; otherwise 'implicit' is used.

explicit-hier Use this option to create a stream that shall explicitly indicate the presence of SBR data. When this option is used, hierarchical signaling is used in order to indicate the underlying audio object type.

implicit Use this option to create a stream that implicitly signals the presence of SBR data.

Note 1: This feature is only applicable when
(1) The audio standard (cfg slot.s/enc.m/aud.n standard) is set to any of the 'AAC-HE*...' settings
(2) The aactransport (cfg slot.s/enc.m/aud.n/adv aactransport) is set to 'auto' or 'loas'.
(3) The aacversion (cfg slot.s/enc.m/aud.n/adv aacversion) is set to 'auto' or 'MPEG-4'.

Note 2: All HE AAC-Profile decoders are supposed to be able to detect SBR in 'implicit'-coded streams.

Intro/Update: 7.3.0/7.3.0

cfg slot.s/enc.m/aud.n/adv **audprodie**

Value(s): OFF, ON

Description: Production info exists. Default is “ON”. If this value is on, transmit mixlevel and roomtype in AC-3 bit streams.

Note: This feature is only applicable when the audio standard (cfg slot.s/enc.m/aud.n standard) is set to any of the “AC-3...” selections.

Intro/Update: 2.2.0/5.2.0

cfg slot.s/enc.m/aud.n/adv **copyright**

Value(s): OFF, ON

Description: Copyright. Used for all analog sources and digital sources without a copyright indication.

Intro/Update: 2.2.0/2.2.0

cfg slot.s/enc.m/aud.n/adv **deemph**

Value(s): OFF, ON

Description: Enables/disables audio deemphasis. Use ‘enable’ to indicate the audio is de-emphasized. The meaning of this checkbox varies according to the form of audio compression being used.

When coding AC-3... The encoder applies deemphasis prior to audio compression.

When coding MPEG... The encoder sets a flag in the audio stream that directs downstream equipment to apply deemphasis.

Note 1: The encoder’s ‘simode’ (cfg slot.s/enc.m/pgm simode) setting affects this parameter.

Note 2: This feature is only applicable when the audio standard (cfg slot.s/enc.m/aud.n standard) is set to either “AC-3...” or “MPEG...“.

Intro/Update: 2.2.0/5.0.0

cfg slot.s/enc.m/aud.n/adv **dialnorm**

Value(s): -31 to -1 dB

Description: Dialog Normalization. Default -27 dB.

Note: This feature is only applicable when the audio standard (cfg slot.s/enc.m/aud.n standard) is set to any of the “AC-3...” selections.

Intro/Update: 2.2.0/5.2.0

cfg slot.s/enc.m/aud.n/adv **langcode**

Value(s): 3 characters

Description: Language Code. Convert from ISO language code.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/enc.m/aud.n/adv **langcode2**

Value(s): 3 characters

Description: Language Code 2. Convert from ISO language code.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/enc.m/aud.n/adv **mixlvl**

Value(s): 80 to 111 dB

Description: Mixing Level. Default 105 dB.

Note: This feature is only applicable when the audio standard (cfg slot.s/enc.m/aud.n standard) is set to any of the “AC-3...” selections.

Intro/Update: 2.2.0/5.2.0

cfg slot.s/enc.m/aud.n/adv **original**

Value(s): OFF, ON

Description: Indicates the audio is original material. Used for all analog sources and digital sources without an original indication.

Note: Default = “ON” in 5.2 and above.

Intro/Update: 2.2.0/5.2.0

cfg slot.s/enc.m/aud.n/adv **roomtype**

Value(s): large, small, unknown

Description: Room Type. Default unknown.

Note: This feature is only applicable when the audio standard (cfg slot.s/enc.m/aud.n standard) is set to any of the “AC-3...” selections.

Note: Default = “small” in 5.2 and above.

Intro/Update: 2.2.0/5.2.0

cfg slot.s/enc.m/aud.n/adv **service**

Value(s): complete-main, music-effects, visually-impaired, hearing-impaired, dialog, commentary, emergency

Description: bit stream mode service type.

Note: This feature is only applicable when the audio standard (cfg slot.s/enc.m/aud.n standard) is set to any of the “AC-3...” selections.

Intro/Update: 2.2.0/5.2.0

23.1.15 ENC Audio Configuration Parameters

cfg slot.s/enc.m/aud.n/rtr

slot.s s = Slot number.
- 3–17 SYS-1700’s range of application module slot numbers.
- 2–4 SYS-200/SYS-300’s range of application module slot numbers.

enc.m m = Encoder number. Only option is “1” on the “ENC-xxx” series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

aud.n n = Audio channel number (1–7).
- 1–2 Primary and secondary audio channels.
- 3* The ENC-H11 and ENC-A21 provide a third audio channel.
- 3–7 * Associated audio channels.

Note: * Availability of this selection is determined by the module’s feature profile. See Table 19-5, "DEC-S11 Module Type Definitions" on page 142. See also util key .

Use these configuration parameters to modify encoder audio router settings.

cfg slot.s/enc.m/aud.n/rtr **in**

Value(s): 1–n (n = the number of router inputs)

Description: Specifies the router (input) port receiving its signal directly from the audio source. Example: On a 12x1 router, valid values for this item would range from 1 to 12.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/enc.m/aud.n/rtr **lvl**

Value(s): 0 to 15

Description: Specifies the router level to associate with this signal.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/enc.m/aud.n/rtr **out**

Value(s): 1–n (n = the number of router outputs)

Description: Specifies the router (output) port connected directly to the specified audio input jack on the encoder module. Example: On a 12x1 router, “1” is the only valid “out” value.

Intro/Update: 2.2.0/3.3.0

23.1.16 ENC Event Configuration Parameters

cfg slot.s/enc.m/event/new

The Event table has a special row called ‘New’. Fields in the ‘New’ row are populated with values using parameters listed in this section. Once the ‘New’ row is populated as desired, an ‘Action’ (cfg slot.s/enc.m/event/new action) is used to affect the Event Table.

cfg slot.s/enc.m/event/row.n

slot.s s = Slot number.
- 3–17 SYS-1700’s range of application module slot numbers.
- 2–4 SYS-200/SYS-300’s range of application module slot numbers.

enc.m m = Encoder number. Only option is “1” on the “ENC-xxx” series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

row.n 1 to 200 = Row number in the Event Table. This table may contain up to 200 event entries.

Use these configuration parameters to create and modify encoder event table entries.

cfg slot.s/enc.m/event/new **action**

Value(s): delete, ignore, reset. update

Description: Specifies the action to be performed on data currently populating the 'New' row of the event table.

Delete Use this value to cause the system to search the Event Table for an entry that matches the Start Date and Start Time currently in the 'New' row. If a match is found, then the matching row of the Event Table is deleted.

ignore Use this value to leave the Event Table unchanged.

reset Use this value to clear all entries in the Event Table.

update Use this value to cause the system to search the Event Table for an entry that matches the Start Date and Start Time currently in the 'New' row. If a match is found, then the matching row of the Event Table is updated with the current values in 'New' row.

Note: Use a single space character to make a field appear blank.

Intro/Update: 7.5.0/7.5.0

cfg slot.s/enc.m/event/new **desc,** cfg slot.s/enc.m/event/row.n **desc**

Value(s): 0 to 255 characters

Description: Specifies the Event Description which is typically used by program guides as a synopsis of the event.

Intro/Update: 7.5.0/7.5.0

cfg slot.s/enc.m/event/new **genre,** cfg slot.s/enc.m/event/row.n **genre**

Value(s): 0 to 255 characters

Description: Specifies the Event Genre and is used by program guides to classify the content of the event. This value's interpretation depends on the current 'SI Mode' (cfg slot.s/enc.m/pgm simode). The following standards specify how this value is used in each SI Mode.

ATSC ATSC Standard A/65C. Program and System Information Protocol for Terrestrial Broadcast and Cable, Section 6.9.3.

DVB ETSI EN 300 468 v1.7.1 (2006-05). Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems, Section 6.2.27, Table 73.

ISDB SBTVD Forum, Brazilian Digital Television Forum, Standard Number 3. Multiplexing and Service Information. Part 2, Section 8.3.11.

Intro/Update: 7.5.0/7.5.0

cfg slot.s/enc.m/event/new **name,** cfg slot.s/enc.m/event/row.n **name**

Value(s): 0 to 255 characters

Description: Specifies the event name. Typically used by program guides as the title of an event.

Intro/Update: 7.5.0/7.5.0

cfg slot.s/enc.m/event/new **rating,** cfg slot.s/enc.m/event/row.n **rating**

Value(s): 0 to 255 characters

Description: Specifies the event rating. Used by program guides to give parental rating information, including age and material information, for the event. This value's interpretation depends on the current 'SI Mode' (cfg slot.s/enc.m/pgm simode). The following standards specify how this value is used in each SI Mode.

ATSC ATSC Standard A/65C. Program and System Information Protocol for Terrestrial Broadcast and Cable, Section 6.9.3.

DVB ETSI EN 300 468 v1.7.1 (2006-05). Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems, Section 6.2.27, Table 73.

ISDB SBTVD Forum, Brazilian Digital Television Forum, Standard Number 3. Multiplexing and Service Information. Part 2, Section 8.3.11.

Intro/Update: 7.5.0/7.5.0

cfg slot.s/enc.m/event/new **startdate,** cfg slot.s/enc.m/event/row.n **startdate**

Value(s): text, YYYY-MM-DD

Description: Specifies the event starting date.

Intro/Update: 7.5.0/7.5.0

cfg slot.s/enc.m/event/new **starttime,** cfg slot.s/enc.m/event/row.n **starttime**

Value(s): ext, hh:mm:ssZ

Description: Specifies the event starting time in UTC. Using ISO 8601 format, the trailing Z indicates UTC.

Note: The lack of Z indicates local time, which is not currently supported.

Intro/Update: 7.5.0/7.5.0

cfg slot.s/enc.m/event/new **usergenre,** cfg slot.s/enc.m/event/row.n **usergenre**

Value(s): 0 to 255 characters

Description: Specifies the event genre (user-defined). Typically used by program guides to classify the content of the event. Unlike the genre, which is defined by standards, this value is defined by the broadcaster.

Intro/Update: 7.5.0/7.5.0

23.1.17 ENC Program Configuration Parameters

cfg slot.s/enc.m/pgm

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

Use these configuration parameters to modify the encoders program settings.

cfg slot.s/enc.m/pgm **bisssw**

Value(s): <string>, <none>

Description: Specifies the BISS Session Word for this program. The encoder allows its Session Word to be written and read – unlike the decoder, which protects its Session Word from being read. A Session Word behaves like a "normal" configuration value. The encoder's Session Word is part of the system's configuration and may be stored internally a profile. Loading a stored profile or configuration file can alter Session Words for the system's encoders. Additionally, a Session Word follows the active service during module failover and failback.

<none> When no BISS scrambling is desired (or allowed), this value may be the empty string.

<string> Specifies the Session Word; a 12-character, hexadecimal string, such as 0a3b5c7d9e1f (upper-case and lower-case letters allowed).

Note: This hexadecimal string does not require an "0x" prefix.

Intro/Update: 5.7.0/5.7.0

cfg slot.s/enc.m/pgm **ccsource**

Value(s): udp, vanc, vbi

Description: Specifies the closed caption source for this program. Depending on the encoder, three sources of closed captions can be available. This parameter selects the active source and disables closed caption processing for the others.

none This option is available on all video encoders. Specifies the absence of a closed caption source, thus disabling closed captions.

udp This option is available on all video encoders. Some closed caption systems transmit their output through a serial port, according to the closed caption protocol. The NetVX™ does not accept this serial protocol directly. Instead, it relies on a serial-to-UDP conversion device (such as a Lantronix MSS-100) to receive serial characters and to re-transmit them over Ethernet. When using this arrangement, the NetVX™'s system controller monitors a specified UDP port for incoming characters and sends any characters it receives over the system backplane to the appropriate encoder.

vanc This option is available only on high-definition video encoders.
This value directs the encoder to extract closed captions from VANC data.

vbi This option is available on the standard-definition video encoders.
This value directs the encoder to extract 608 closed captions from VBI lines of the video (line 21 for NTSC). The VBI function must be set accordingly.

Intro/Update: 6.5.2/7.2.0

cfg slot.s/enc.m/pgm **country**

Value(s): Three-Character Country Code

Description: Specifies the three-character country code as described in ISO-3166.

Intro/Update: 7.5.0/7.5.0

cfg slot.s/enc.m/pgm **cctran**

Value(s): always, as-needed, none

Description: Specifies the closed caption translation behavior. An encoder can receive 608 and 708 closed captions from a variety of sources. If it receives 608 but not 708 captions, it can translate the incoming 608 captions to supply the ATSC 708 captions for downstream decoders.

always Enables 608-to-708 translation. Any incoming 708 captions are discarded, and translated 608 captions are used instead.

as-needed Enables 608-to-708 translation. If the input carries 708 captions, they are used to provide captions downstream. If, however, the input does not carry 708 captions, incoming 608 captions are translated and used to supply 708 captions. This process can be intermittent. For example, if the input has some segments with and some segments without 708 captions, the encoder will preserve 708 input and translate 608 input as necessary to provide continuous 708 captions.

none Disables 608-to-708 translation. Incoming 708 captions (if present) are preserved.

Note: On the AUD-D14, this parameter is displayed but not used.

Intro/Update: 7.6.0/7.6.0

cfg slot.s/enc.m/pgm **datasource**

Value(s): udp, none

Description: Use this control to specify the whether or not the system uses a UDP data source. The encoder accepts data up to the configured data rate.

none Specifies the absence of a data source, thus disabling data insertion into the program stream.

udp Some systems generate out-of-band data that need to be passed to the decoder site. The encoder can receive data over UDP, merge them into the transport stream, and transmit the data to the decoder site. The system controller monitors the configuration database and specific UDP ports for incoming characters, sending them over the system backplane to the appropriate encoder.

Intro/Update: 7.5.0/7.5.0

cfg slot.s/enc.m/pgm **datarate**

Value(s): 0 to 100,000 bps

Description: Use this control to specify the maximum data bitrate for this program. When the data source specifies data input (value other than {none}), incoming data will be added to the encoder's program as a data stream. The encoder will discard data to avoid overrunning the configured bandwidth.

The encoder accepts data up to the configured rate and discards excess data. Given this rate, the associated transport stream bitrate can be computed:

```
ts_rate = data_rate * 188 / 175
```

Every transport stream packet (188 bytes) carries a 4-byte header. Packets with data also carry a 9-byte PES header, leaving 175 bytes for the data payload.

Note: The encoder deducts this stream's bandwidth from the overall transport stream rate when computing the video rate.

Intro/Update: 7.5.0/7.5.0

cfg slot.s/enc.m/pgm **encryptmode**

Value(s): biss, <none>

Description: Specifies the encryption mode for this program. With encryption operating, an encoder can scramble its output and pass that stream over an insecure medium to an authorized decoder, which can unscramble the stream.

none Disables encryption. The encoder generates unscrambled output.

biss Enables BISS encryption. This option directs the encoder to use its BISS session word (specified by cfg slot.s/enc.m/pgm bisssw above) to scramble the output MPEG stream. A decoder will need the Session Word in order to decrypt the stream. If an encoder's BISS is enabled without having a Session Word, the encoder asserts an alarm (See the "Module Degrade - Configuration Error" command on page 431). For details, see EBU Technical Specification Tech 3292 (rev. 2, August 2002), BISS-E, Basic Interoperable Scrambling System with Encrypted Keys.

Intro/Update: 5.7.0/5.7.0

cfg slot.s/enc.m/pgm **esdsource**

Value(s): none, ccap, udp

Description: Specifies the source of ESD data.

none ESD is disabled.

ccap ESD are extracted from the closed caption data.

udp ESD are received by the encoder as UDP packets over Ethernet. the data are received on UDP port 65220+slot, using the slot number of the encoder.

Intro/Update: 8.5.1/8.6

cfg slot.s/enc.m/pgm **eventsched**

Value(s): text string

Description: Specifies the event schedule duration in hours.
An encoder can have entries in its event Row table, giving information about upcoming content. This value specifies how much extended schedule information to include in the transport stream.

0 If the event Row table has entries, a zero schedule duration tells the encoder to generate a minimal event table with the present and following events. No extended schedule information will be sent, but the EIT will be present.

1 to 2400 A non-zero value gives the maximum schedule length. All events that start within the given time span will be included in the EIT.

Intro/Update: 8.0.0/8.0.0

cfg slot.s/enc.m/pgm **name**

Value(s): text string

Description: Specifies the program name.
When the cfg slot.s/enc.m/pgm simode is set to either “DVB” or “ATSC“, the encoder uses this string for the SDT table's “service_descriptor”.
The Vidiem Service Manager (a separate product from the Vidiem™ Element Management System), writes in this parameter, the number of the reservation using this encoder.

Intro/Update: 4.0.0/5.0.0

cfg slot.s/enc.m/pgm **networkid**

Value(s): 1 to 65535

Description: Specifies the DVB network identifier for this program. This 16-bit value identifies the network delivery system when the system information mode is set for DVB. Other SI modes ignore this value.

Note 1: This parameter requires the encoder's simode (cfg slot.s/enc.m/pgm simode) to be set to "DVB".

Note 2: See DVB A038 and ETSI ETR-162 for details.

Intro/Update: 5.5.0/5.5.0

cfg slot.s/enc.m/pgm **noinput**

Value(s): black, stop

Description: Specifies how the encoder should respond to a loss of video input. In both of the following cases, the encoder generates a complete program map table (PMT).

Black The encoder continues generating elementary stream data for the lost signal. The encoder simulates black input for lost video and mute for lost audio. This setting effectively instruct the encoder to pretend that all inputs are present, supplying synthetic (black, mute) input as needed.

Stop This setting forcibly shuts down some or all of the transport stream, depending on the lost input.

The encoder stops generating MPEG packets on the PID of the lost input, but the PMT continues to carry the PID entry. If the stream is configured to put the PCRs in the video PID (See "cfg slot.s/enc.m/pgm pcrloc" on page 205), the encoder stops sending PCRs.

When the video input is lost, the encoder stops sending the PAT, PMT, and all program PIDs including audio, video, PCR, etc.

When the audio input is lost, but video remains present, the encoder continues sending the PAT, the PCR packets and the PMT (with all of its elements including video, audio, lost audio, PCR, etc.). The encoder stops sending packets for lost audio.

Intro/Update: 5.6.0/6.0.0

cfg slot.s/enc.m/pgm **pcrloc**

Value(s): combined, separate

Description: Identifies the location of the Program Clock Reference (PCR) PID.

combined PCRs go in the video, if it exists, if video does not exist, then PCRs are sent in a separate PID as described below.

separate This value directs the encoder to use a separate PID for PCRs. This option may be used when encoding video.

Note: When using associated audio, the ENC-H11 requires separate PCRs (beginning h.g.a). The AUD-D14 receives a copy of the encoder's output, and it uses the PCRs to synchronize the associated audio timing with the rest of the program. If the ENC-H11 rate is too high, the AUD-D14 cannot properly extract the PCRs from the video. Using a separate PCR location avoids this problem.

Intro/Update: 4.0.0/7.7.1

cfg slot.s/enc.m/pgm **pip**

Value(s): auto, off

Description: This parameter controls the Picture-in-Picture (PIP) behavior. Enable this control only if the signal being generated is going into a Microsoft IPTV Head end.

When PIP is enabled, the encoder generates a reduced-resolution video stream to accompany the main program. The addition of this secondary video causes the encoder to emit a multi-program transport stream: Program 1 carries the full resolution video, Program 2 carries the PIP video.

The PIP program carries two sub-streams: video and EIA-708-B closed captions. The PIP program does not include audio. The program consumes 200 Kbps of the transport stream's rate, which applies to the full MPTS. As a result, the PIP stream effectively reduces the rate available to the base program by 200 Kbps.

auto Enables the PIP stream for this program. The encoder generates a two-program, multi-program transport stream.

off Disables PIP for the program. No reduced resolution stream is generated for the base program. The encoder generates a single-program transport stream to carry the base program.

Note: This parameter is only available on the ENC-A11 module.

Intro/Update: 7.0.0/7.2.0

cfg slot.s/enc.m/pgm **simode**

Value(s): atsc, atsc-unchecked, isdb-tb-fixed, isdb-tb-mobile, dvb-checked, dvb-unchecked, mpeg

Description: Specifies the SI-PSI mode for the MPEG transport stream. The selection chosen affects rates a which critical MPEG tables are transmitted and imposes constraints on other configuration parameters as described in Table 23-6 below.

atsc Use the ATSC conventions, appropriate for digital on-air broadcast in the US (HDTV or digital standard definition). An encoder using standard definition input should conform to main profile at main level (MP@ML) in this mode. An encoder using high definition input should conform to main profile at high level (MP@HL) in this mode. Semantically, this value enforces ATSC constraints, providing the "checked" counterpart to atsc-unchecked. This mode does not use the program's event table to provide an electronic program guide.

atsc-mph Use the ATSC conventions, appropriate for mobile/handheld broadcast in the US. This value uses the ATSC conventions for SI and PSI, and it sends only the PAT and PMT. This mode does not use the program's event table to provide an electronic program guide. When using this SI mode, the encoder should be connected to an IP VC on the system controller, function {mph-rtp-tx}.

atsc-unchecked Use the ATSC conventions, appropriate for digital on-air broadcast in the US (HDTV or digital standard definition). This value uses the ATSC conventions for SI and PSI, but it does not enforce the constraints on other parameters. This mode does not use the program's event table to provide an electronic program guide.

isdb-tb-fixed Use the ISDB-Tb (Integrated Services Digital Broadcasting, Terrestrial Brazil) conventions, appropriate for Brazil. This value specifically generates tables appropriate for the "fixed" programs (intended for fixed-location decoders, such as residential televisions). This mode uses the program's event table to provide an electronic program guide.

isdb-tb-mobile Use the ISDB-Tb (Integrated Services Digital Broadcasting, Terrestrial Brazil) conventions, appropriate for Brazil. This value specifically generates tables appropriate for the "mobile" programs (intended for mobile decoders, such as cell phones).
This mode uses the program's event table to provide an electronic program guide.

dvb-checked Use the DVB conventions, appropriate for Europe and some US cable companies. This value specifically enables the constraint checking described below. This mode uses the program's event table to provide an electronic program guide. See DVB Document A001 Rev. 7 February 2007, Specification for the use of Video and Audio Coding in Broadcasting Applications based on the MPEG-2 Transport Stream for details.

dvb-unchecked Use the DVB conventions, appropriate for Europe and some US cable companies. This value uses the DVB conventions for SI and PSI, but it does not enforce the constraints on other parameters. This mode uses the program's event table to provide an electronic program guide.

mpeg Use generic MPEG conventions. This mode does not use the program's event table to provide an electronic program guide.

Table 23-6 SI/PSI Mode Table Transmission Rates and Other Parameter Constraints

Parameter	SI-Mode *	Constraint
	* Note: The SI-Mode is only listed for parameters with an asscociated constraint. SI-Modes that are not listed have no constraint.(s).	
cfg slot.s/enc.m/aud.n/adv deemph on page 197	DVB Checked	Only “OFF”
cfg slot.s/enc.m/aud.n inlvl on page 187	DVB Checked	If the enccoder is processing analog input, then the level must ‘pro18’.
cfg slot.s/enc.m/aud.n mode on page 188	ATSC Checked	Must not be set to ‘dual-mono’.

Table 23-6 SI/PSI Mode Table Transmission Rates and Other Parameter Constraints

Parameter	SI-Mode *	Constraint
	* Note: The SI-Mode is only listed for parameters with an asscociated constraint. SI-Modes that are not listed have no constraint.(s).	
cfg slot.s/enc.m/aud.n standard on page 189 cfg slot.s/enc.m/aud.n/adv service on page 198	ATSC Checked	The standard must be ac3-* or extComp-* (using AC-3 compression). A main service audio channel cannot exceed 448 Kbps. An associated service audio channel cannot exceed 128 Kbps (with the exception that a "dialogue" channel should not exceed 192 Kbps). Sum of audio rates for a main service and its associated service must not exceed 576 Kbps.
	DVB Checked	Must be mpeg-* or extComp-* (using MPEG compression). One audio channel cannot exceed 384 Kbps.
cfg slot.s/enc.m/pgm tsrate on page 212	ATSC Checked	Standard definition programs' video rate must not exceed 15 Mbps. High definition video requires the transport stream rate not to exceed 19.4 Mbps. SI tables sent at ATSC intervals.
	ATSC Unchecked	SI tables sent at ATSC intervals.
	DVB Checked	Standard definition programs' video rate must not exceed 15 Mbps. High definition video does not constrain the transport stream rate. SI tables sent at DVB intervals.
	ATSC M/H DVB unchecked ISDB-Tb MPEG	SI tables sent at generic MPEG intervals.
cfg slot.s/enc.m/vbi/fld.f/lin.l function on page 221	ATSC checked	Line 21 (fields 1 and 2) may be set to either 'none' or 'closedcaption'. All other line, in both fields must be set to 'none'.
	DVB checked	No more than one line can be lossless.
cfg slot.s/enc.m/vid gop on page 229	ATSC M/H ISDB-Tb mobile	gop-I, gop-IP
cfg slot.s/enc.m/vid input on page 231	ATSC Checked	Only black-525, black-720-59, black-1080-29, comp-ntsc, sdi-525, sdi-720-59, sdi-1080-29.
	ATSC M/H	black-525, sdi-525

Table 23-6 SI/PSI Mode Table Transmission Rates and Other Parameter Constraints

Parameter	SI-Mode *	Constraint
	* Note: The SI-Mode is only listed for parameters with an asscociated constraint. SI-Modes that are not listed have no constraint.(s).	
cfg slot.s/enc.m/vid res on page 234	ATSC Checked	Only std-640-420, std-704-420, std-1280-420, std-1920-420.
	ATSC M/H	Only cif-352-420, mph-416-420, qvga-320-420
	'DVB Checked' with input types: black-625 comp-pal sdi-625	Only cif-352-420, std-352-420, std-480-420, std-544-420, std-720-420
	'DVB Checked' with input types: black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	Only cif-352-420, std-352-420, std-480-420, std-544-420, std-640-420, std-720-420
	'DVB Checked' with input types: black-720-50 black-720-59 sdi-720-50 sdi-720-59	Only std-640-420, std-960-420, std-1280-420
	'DVB Checked' with input types: black-1080-24sf black-1080-25 black-1080-29 sdi-1080-24sf sdi-1080-25 sdi-1080-29	Only std-960-420, std-1280-420, std-1440-420, std-1920-420.

Intro/Update:2.0.0/8.1.0

cfg slot.s/enc.m/pgm **tag**

Value(s): Any text string up to 31 characters.

Description: Specifies a name for this encoding program.

Note: See Section 22.6, "Overview of NetVX™ Tags" on page 159.

Intro/Update:2.0.0/2.0.0

cfg slot.s/enc.m/pgm **spliceevent**

Value(s): Enable, Disable

Description: Enables/disables the transmission of an event alarm (vancDeg, splice event) and its associated event trap when the encoder receives a splice trigger.

Intro/Update:7.7.1/7.7.1

cfg slot.s/enc.m/pgm **splicegpimode**

Value(s): close-in, close-in-out, close-out, open-in, open-in-out, open-out

Description: Specifies the splice point behavior for GPI triggers. When a program's 'cfg slot.s/enc.m/pgm splicetrigger' vaue is set to any value between 'GPI-<1-4>', this parameter specifies the correspondence between 'In Point' and 'Out Point' with the GPI condition.

close-in Generates 'mark-in' when GPI closes. No action when GPI opens.

close-in-out (Default – 'Traditional' behavior) Generates 'mark-in' when GPI closes and 'mark-out' when GPI opens.

close-out Generates 'mark-out' when GPI closes. No action when GPI opens.

open-in Generates 'mark-in' when GPI opens. No action when GPI closes.

open-in-out Generates 'mark-in' when GPI opens and 'mark-out' when GPI closes.

open-out Generates 'mark-out' when GPI opens. No action when GPI closes.

Note: See the "cfg slot.s/enc.m/pgm splicetrigger" command on page 211

Intro/Update: 7.6.0/7.6.0

cfg slot.s/enc.m/pgm **splicepreroll**

Value(s): 0, 0.001 to 10.000 (seconds)

Specifies the delay between a splice point trigger and its insertion. When an encoder is configured to use GPI splice point triggers, this value tells the encoder how long to wait between a splice point trigger and the insertion of the associated In Point or Out Point.

0 The encoder inserts a splice point immediately.

0.001–10.000 The encoder inserts a splice point following this specified period of delay. This value specifies the time between the first cueing message and the arrival of the associated In or Out Point. SCTE 35-2004 recommends a minimum delay of 4 seconds, but the system allows a smaller interval.

Note 1: When a trigger occurs, the encoder uses the current DTS (display time stamp) and the preroll value to compute the DTS for the next 'In Point' or 'Out Point'.

Note 2: When the 'Point' time arrives, the encoder inserts the splice point as near to the computed time as possible.

Note 3: The actual 'In Points' and 'Out Points' are not necessarily frame aligned.

Intro/Update: 7.0.0/7.2.0

cfg slot.s/enc.m/pgm **splicetrigger**

Value(s): gpi-1, gpi-2, gpi-3, gpi-4, ctp, vanc, none

Description: Specifies the trigger for splice point insertion. Some applications rely on insertion cueing to switch from a program's main to secondary material (such as a commercial). As defined by ANSI/SCTE 35-2004, Digital Program Insertion Cueing Message for Cable, information can be inserted in the program stream to coordinate these insertion points. The timing of the insertion cues depends on the preroll configuration. See the "cfg slot.s/enc.m/pgm splicepreroll" command on page 210.

gpi-1, gpi-2, gpi-3, gpi-4 — These values enable cueing insertion, using the designated contact switch as the insertion trigger. When the switch closes, the encoder sends 'In Point' information. When the switch re-opens, the encoder sends 'Out Point' information.

none — This value disables splice point insertion.

tcp — This value enables cueing insertion using the SCTE-104 protocol (simple profile only). The system and the automation server communicate using a TCP/IP connection. The system controller monitors the configuration database and specific TCP/IP ports for incoming connection requests. The controller then forwards protocol messages over the backplane to the appropriate encoder.

Note 1: TCP Option: The encoder ignores the splice preroll (See the "cfg slot.s/enc.m/pgm splicepreroll" command on page 210) value when using this option.

Note 2: TCP Option: When an automation system sends an encoder splice trigger information (SCTE-104) over Ethernet, it must use TCP/IP ports that are implicitly associated with NetVX™ slots. The IP port number for a given encoder is calculated as 65300 + slot #. For example, an automation server sending SCTE-104 information to an encoder in slot 4 should be configured to use the IP address of the NetVX™ system controller along with TCP port 65304.

vanc — This value enables cueing insertion using the SCTE-104 protocol (simple profile only) over VANC, as defined in SMPTE RP-2010. In this mode here is no return channel from the system (the injector) and the automation server; no response messages are sent. The encoder must be using digital video input to extract trigger information from VANC data (on DID 0x41, SDID 0x07 (See the "cfg slot.s/enc.m/vanc/srv.n did" command on page 217, and the See the "cfg slot.s/enc.m/vanc/srv.n sdid" command on page 217). The encoder ignores the splice point preroll value when using VANC triggering.

Note 3: Multiple encoders are allowed to use the same GPI as a splice point trigger. For example, an encoder and its backup probably should use the same trigger GPI to ensure continued splice point insertion across a failover. Other applications might reasonably want identical splice point insertion.

Note 4: For GPI insertion to be active, the designated GPI function (See the "cfg sys/gpi.m function" command on page 313) must be configured to 'splice'. Other function values cause the encoder to behave as if it were configured with a trigger of 'none'.

Intro/Update: 7.0.0/7.6.0

cfg slot.s/enc.m/pgm **tsrate**

Value(s): 0.1000 to 108.0000 Mbps

Description: Specifies the encoder's overall transport stream rate. In Stat Mux Mode this rate is summed amongst all the encoders operating as part of the Stat Mux group to determine the overall amount of bandwidth available for the Stat Mux group.

The following are the default transport stream bit rates for various modules.

ENC-S11 10.0 Mbps.

ENC-H11 15.0 Mbps.

AUD-D14 10.0 Mbps.

ENC-A11 2.0 Mbps.

ENC-A21 2.0 Mbps.

Note 1: See Section 26.4, "Overview of the Program Transport Stream Rate" on page 458 for a detailed description of how the bandwidth specified by this parameter is used.

Note 2: The encoder's 'simode' (cfg slot.s/enc.m/pgm simode) setting may affect this parameter.

Note 3: This rate accepts up to four values after the decimal point.

Intro/Update: 2.0.0/8.4.0

23.1.18 ENC Vertical Ancillary Data Configuration Parameters

cfg slot.s/enc.m/vanc

slot.s s = Slot number.

3–17 SYS-1700's range of application module slot numbers.

2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

Use these configuration parameters to modify encoder vertical ancillary data settings.

cfg slot.s/enc.m/vanc **didfilter**

Value(s): enable, disable

Description: Enables/disables VANC service filtering by DID/SDID values.

enable Use this option to enable explicit, individual VANC services. Table entries with valid DID/SDID combinations are extracted from the encoder's input and copied to the transport stream output. VANC data with non-matching DID/SDID values are filtered out and discarded.

disable Use this option to disable explicit, individual services. Disabled Services are specified through DID and SDID values in the VANC table.

When this option is chosen, all VANC data are extracted from the encoder's input (instead of being filtered) and data that is "eligible" for passthrough is copied to the MPEG output stream. See Table 23-7, "DID/SDID Value Ranges and Passthrough Behavior When Filter is Off" on page 217. The encoder handles some VANC data input directly, such as embedded audio. These VANC data might affect the generated transport stream, but they are not copied to the stream as part of the unfiltered processing.

Intro/Update: 6.6.0/6.6.0

cfg slot.s/enc.m/vanc **klvrate**

Value(s): 0.00 to 2.00 (Kbps)

Description: Specifies the maximum transport stream bitrate for KLV-encoded metadata.

0 Disables KLV metadata from entering the encoder's transport stream output.

0.01 to 2.0 Allocates bandwidth for data, obtained from the encoder's input. Metadata are carried in their own packetized elementary stream. The encoder discards data to avoid overrunning the configured bandwidth.

The following standards describe and specify KLV metadata:

- RP 214-2002, SMPTE Recommended Practice, Packing KLV Encoded Metadata and Data Essence into SMPTE 291M Ancillary Data Packets.
- RP 217-2001, SMPTE Recommended Practice, Nonsynchronized Mapping of KLV Packets into MPEG-2 Systems Streams.
- SMPTE 336M-2001, SMPTE Standard, for Television---Data Encoding Protocol using Key-Length-Value.
- MISB RP 0605.01, Motion Imagery Standards Board Recommended Practice, Inserting Time Code and Metadata in High Definition Uncompressed Video.

KLV metadata can be carried two separate ways in the transport stream. Both methods extract VANC data from DID 0x44 and SDID 0x04.

Additionally, a VANC service can be defined to filter on the DID and SDID, which would extract the metadata, combine it with other VANC services, and carry the aggregate VANC services in the stream. This aggregate data stream's rate is controlled by the VANC rate (cfg slot.s/enc.m/vanc rate). Either or both methods can be used to extract KLV metadata, resulting in zero, one, or two copies of the metadata in the transport stream. See DID filtering (see Table 23-7, "DID/SDID Value Ranges and Passthrough Behavior When Filter is Off" on page 217) for details about how to select what input data to transfer or discard.

This configured metadata rate is divided by the video frame rate to determine the data limit per frame. Data are extracted from the input and copied to the output, up to the limit of the current frame. Any additional data are dropped, potentially causing an alarm (VANC Degrade - VANC Error)

Note: Note this data rate must be deducted from the program's transport stream bitrate when computing the video rate.

Intro/Update: 7.5.0/7.5.0

cfg slot.s/enc.m/vanc **op47lines**

Value(s): 0, 1 to 34

Description: Use this control to specify the maximum number of OP-47 teletext lines per frame to process.

0 Disables OP-47 teletext processing.

1 to 34 The encoder uses this value to allocate sufficient bandwidth to carry the specified number of lines, obtained from the encoder's input. The encoder will discard data as necessary to avoid overrunning the configured maximum teletext lines per video frame.

When computing the transport stream bandwidth associated with OP-47 subtitling, the data are packaged similar to VBI function {wst} using EN-300-472. Note that OP-47 processing always uses the EN-300-472 transmission format, regardless of the VBI teletext mode. The presence of OP-47 lines can insert a VBI teletext descriptor into the transport stream.

Teletext from VANC data can be carried two separate ways in the transport stream. Both methods extract VANC data from DID and SDID (0x43, 0x02) for subtitling distribution packets or from (0x43, 0x03) for VANC multipackets.

(1) If the OP-47 line count is configured to a non-zero value, then any teletext lines are carried in their own packetized elementary stream (this includes both subtitling distribution packets and multipackets carrying teletext subtitling).

(2) Additionally, a VANC service can be defined to filter on the DID and SDID, which would extract the subtitling, combine it with other VANC services, and carry the aggregate VANC services in the stream.

This aggregate data stream's rate is controlled by the VANC rate. Either or both methods can be used to extract OP-47 subtitling, resulting in zero, one, or two copies of the subtitling in the transport stream. See DID Filtering (see Table 23-7, "DID/SDID Value Ranges and Passthrough Behavior When Filter is Off" on page 217) for details about how to select what input data to transfer or discard.

Note 1: OP-47 is described in: “Free TV Australia Operational Practice OP-47, Storage and Distribution of Teletext Subtitles and VBI Data for High Definition Television”, Issue 3, April 2007.

Note 2: This configured subtitling line count applies to one video frame. Data are extracted from the input and copied to the output, up to the limit of the current frame. Any additional subtitling lines are dropped (and counted explicitly as dropped OP-47 lines), potentially causing an alarm (vancDeg, VANC error). Note that subtitling packets dropped as part of VANC service processing are counted as general VANC dropped packets, not specifically as dropped OP-47 lines.

Note 3: Only one of KLV metadata and OP-47 teletext subtitling can be active. If both this OP-47 line count and the KLV metadata rate are non-zero, the module will assert an alarm (modDeg, configuration error).

Note 4: This feature was introduced in NetVX™ Firmware Release 7.7.0. This release support OP-47 only on the ENC-H11.

Intro/Update: 7.7.0/7.7.0

cfg slot.s/enc.m/vanc **rate**

Value(s): 0.00 to 2.00 (Kbps, fixed 1.2 format)

Description: Specifies the VANC data rate in Kbps.

Intro/Update: 2.0.0/6.0.0

cfg slot.s/enc.m/vanc **smpte2038**

Value(s): enable, disable

Description: Use this to control the formatting of ancillary data in the transport stream.

enable Ancillary data are formatted in accordance with SMPTE 2038.

disable Ancillary data are formatted in accordance with SMPTE RDD-11.

Intro/Update: 8.5.1/8.6

cfg slot.s/enc.m/vanc **vancdeg**

Value(s): enable, disable

Description: VANC degrade alarm enable.

Note: Use the cfg sys/alm vancDegSev command to set this alarm's severity level.

Intro/Update: 2.0.0/5.0.0

23.1.19 ENC Vertical Ancillary Data Service Configuration Parameters

cfg slot.s/enc.m/vanc/srv.n

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

srv.n n = Vertical ancillary data service number (1–16).

Use these configuration parameters to modify encoder vertical ancillary data service settings.

cfg slot.s/enc.m/vanc/srv.n **did**

Value(s): 0 to 255

Description: Specifies the service's primary data ID (DID). When the VANC DID filter is enabled, entries in the data service table specify DID/SDID pairs that identify data to copy from the input to the encoder's transport stream output. Non-matching data are filtered out and discarded.

As mentioned above, closed captions use a DID value of 0x61. Encoders extract closed captions automatically and move them to the program's picture user data. If a VANC service is specified with the DID and SDID for closed captions, the encoder will additionally pass the closed caption data as a VANC service.

Repeating some information from SMPTE 291M-1998 and SMPTE 334M-2000, the following table summarizes the DID/SDID values. The entries indicated as eligible can be copied to the transport stream output (either by an active service table entry or when the VANC DID filter is disabled).

Note 1: The Secondary Data ID (SDID) is ignored if the Data ID (DID) on the same service is set to 128 (decimal) or greater.

Note 2: For valid values, see Table 23-7, "DID/SDID Value Ranges and Passthrough Behavior When Filter is Off" on page 217.

Intro/Update: 2.0.0/6.6.0

cfg slot.s/enc.m/vanc/srv.n **sdid**

Value(s): 0 to 255

Description: Specifies the service's secondary data ID. As mentioned above, closed captions use SDID values of 0x01 for EIA-708-B and 0x02 for EIA-608 data. Encoders extract closed captions automatically and move them to the program's picture user data. If a VANC service is specified with the DID and SDID for closed captions, the encoder will additionally pass the closed caption data as a VANC service.

The Secondary Data ID (SDID) is ignored if the Data ID (DID) on the same service is set to 128 (decimal) or greater.

Note: For valid values, see Table 23-7, "DID/SDID Value Ranges and Passthrough Behavior When Filter is Off" on page 217.

Intro/Update: 2.0.0/7.2.0

Table 23-7 DID/SDID Value Ranges and Passthrough Behavior When Filter is Off

DID	SDID	Pass Through with Filter OFF	Notes
0x00	any	no	Undefined value. Both the DID and SDID designate zero as undefined in all contexts. A zero DID overrides the SDID and makes it irrelevant. Similarly, a zero SDID should not occur with any DID.
any	0x00		

Table 23-7 DID/SDID Value Ranges and Passthrough Behavior When Filter is Off

0x01 0x02 0x03	n/a	no	These DID values are reserved (unused).
0x04	0x?0 0x?4 0x?8 0x?c	no	Reserved for 8-bit applications. The low-order 2 bits of the SDID must be zero; the upper 4 bits of the SDID (represented as '?') are unrestricted. The SDID value 0x00 is excluded.
0x05 0x06 0x07	n/a	no	These DID values are reserved (unused).
0x08	0x?0 0x?4 0x?8 0x?c	no	Reserved for 8-bit applications. The low-order 2 bits of the SDID must be zero; the upper 4 bits of the SDID (represented as '?') are unrestricted. The SDID value 0x00 is excluded.
0x09 0x0a 0x0b	n/a	no	These DID values are reserved (unused).
0x0c	0x?0 0x?4 0x?8 0x?c	no	Reserved for 8-bit applications. The low-order 2 bits of the SDID must be zero; the upper 4 bits of the SDID (represented as '?') are unrestricted. The SDID value 0x00 is excluded.
0x0d 0x0e 0x0f	n/a	no	These DID values are reserved (unused).
0x10 to 0x3f	any	no	These DID/SDID values are reserved.
0x40 to 0x4f	0x01 to 0xff	yes	These DID/SDID values are registered. (0x41, 0x01): Payload identification. (0x41, 0x07): SCTE-104 splice point triggers. (0x44, 0x04): KLV-Encoder metedata (0x45, 0x01): Dolby audio metadata.
0x50 to 0x5f	0x01 to 0xff	yes	These DID/SDID values are for user applications. (0x51, 0x01): Film codes.
0x60 to 0x7f	0x01 to 0xff	yes	These DID/SDID values are registered. (0x60, 0x60): RP-188 ancillary time code. (0x61, 0x01): EIA-708-B closed captions. (0x61, 0x02): EIA-608 closed captions. (0x62, 0x01): RP-207 program description. (0x62, 0x03): RP-208 VBI data.
0x80 to 0x9f	n/a	no	These DID values are defined to ignore the SDID.
0xa0 to 0xdf	n/a	yes	These DID values are defined to ignore the SDID.
0xe0 to 0xe7	n/a	no	These DID values are defined to ignore the SDID. (0xe0 to 0xe3): 299M, HDTV, control. (0xe4 to 0xe7): 299M, HDTV, audio.
0xe8 to 0xeb	n/a	yes	These DID values are defined to ignore the SDID.
0xec to 0xef	n/a	no	These DID values are defined to ignore the SDID. (0xec to 0xef): AES control packet.
0xf0 to 0xf3	n/a	yes	These DID values are defined to ignore the SDID.

Table 23-7 DID/SDID Value Ranges and Passthrough Behavior When Filter is Off

0xf4	n/a	no	These DID values are defined to ignore the SDID. (0xf4): Error detection (EDH).
0xf5 to 0xf7	n/a	yes	These DID values are defined to ignore the SDID. (0xf5): Time code.
0xf8 to 0xff	n/a	no	These DID values are defined to ignore the SDID. The following items have registered meanings, are used internally by the encoder, and should not be assigned to services: (0xf8 to 0xff): AES audio.

23.1.20 ENC VBI Configuration Parameters

cfg slot.s/enc.m/vbi

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

Use this configuration parameter to modify for alarm notification.

cfg slot.s/enc.m/vbi **vbittx**

Value(s): dual, en-300-472, en-301-775

Description: Specifies how to transmit DVB teletext for all VBI lines configured as WST. Two standards govern the format of DVB teletext, EN-301-775and EN-300-472. Although EN-301-775 supersedes the earlier EN-300-472, some receivers were manufactured before the newer standard was available. Consequently, they are unable to decode the newer teletext format in EN-301-775.

dual Transmit System B Teletext in both a separate PES and in a new PES combined with other VBI information. This mode supports systems broadcasting to a population with old decoders conforming to EN-300-472 and new decoders conforming to EN-301-775. This mode requires twice as much bandwidth within the transport stream to support teletext.

en-300-472 Transmit System B Teletext in a separate PES, as described in EN-300-472. EN-300-472: Specification for conveying ITU-R System B Teletext in DVB bit streams (1997);

en-301-775 Transmit System B Teletext combined in the same PES with other VBI information, as described in EN-301-775. EN-301-775: Specification for the carriage of Vertical Blanking Information (VBI) data in DVB bit streams (2000).

Intro/Update: 6.0.0/6.5.0

cfg slot.s/enc.m/vbi **vbideg**

Value(s): enable *, disable

Description: VBI Degrade Alarm Enable.

Note 1: Use the cfg sys/alm vbiDegSev command to set this alarm's severity level.

Note 2: * Availability of this selection is determined by the module's feature profile. See Table 14-6, "ENC-S11 Module Type Definitions" on page 106. See also util key .

Intro/Update: 3.1.0/4/0.0

23.1.21 ENC VBI Line and Field Parameters

cfg slot.s/enc.m/vbi/fld.f/lin.l

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

fld.f f = Field number (1–2)
- 1 Video field 1.
- 2 Video field 2.

lin.l l = Line number (5–22; 273–285, see Table 23-8 below)

Use the configuration parameters in this branch to modify encoder VBI settings.

VBI settings have the following constraints based on video cfg slot.s/enc.m/vid input and resolution cfg slot.s/enc.m/vid res settings.

Table 23-8 VBI Field and Line Number Setting Constraints

Format		VBI Line Number	
		Field 1	Field 2
NTSC	Frame	10 to 22	273 to 285
	VBI Table	10 to 22	10 to 22
PAL	Frame	6 to 23	318 to 335
	VBI Table	6 to 23	5 to 22

cfg slot.s/enc.m/vbi/fld.f/lin.l **function**

Value(s): amol-48, amol-96, closedcaption, dvitc, lossless, none, testPattern, wss, wst

Description: Specifies the VBI line processing function.

amol-48, amol-96 Specifies this line should carry an AMOL waveform (Automated Measurement of Lineups), as specified by ANSI/CEA-2020, Other VBI Waveforms, December 2007. The encoder extracts the AMOL data from this line (typically line 20 or 22) of the input video, decodes that according to ANSI/CEA-2020, and transmits it through the MPEG stream.

The two values specify 48 bits/line and 96 bits/line, using a waveform appropriate for the indicated bit coding. The values can be combined on different lines and/or fields.

ClosedCaption Specifies this line should carry closed caption data. That is, the encoder extracts the closed caption data from this line (typically line 21) of the input video, decodes that according to EIA-608, and transmits it through the MPEG stream according to EIA-708.

Typically, this value would be used for standards NTSC and NTSC-J and would be specified only to VBI line 21 (in both fields). Nonetheless, the encoder does not treat this value as a special case. It will do its best to process closed captions on whatever lines are configured.

A digital input stream can carry closed captions in its vertical ancillary data. Encoders that support closed caption processing (indicated by having the feature-enc-vbi feature bit) can elect to use the VANC data for closed captions. See Closed Captions for additional information.

dvitc This directs the encoder to extract Digital Vertical Interval Time Code from the specified VBI lines. The time codes are then transmitted in the MPEG stream according to ETSI EN 301 775 (a private extension). Typically, DVITC is carried on line 14, but it can appear on other VBI lines.

lossless Monochrome sample data coding can be used to transmit 4:2:2 data without chrominance. See ETSI EN 301 775 V1.1.1, section 4.8. A program in DVB mode has constraints on using this function.

none Specifies no VBI data for this line.

testPattern The encoder puts data in the MPEG stream telling the decoder to insert a specific test pattern on this VBI line. If the decoder's override is configured to none, it will insert the specified test pattern in the corresponding line of the output.

wss This value directs the encoder to extract Wide Screen Signaling (WSS) from the specified VBI line, as defined by ETSI standard EN 300 294. The WSS data is transmitted in the MPEG stream according to ETSC EN 301 775. For standard video signals, WSS appears on field 1, line 23. Use of this function value on other lines is discouraged.

If WSS is successfully extracted from field 1, line 23, and the program's SI-PSI mode is other than MPEG, and the video aspect ratio is either auto-4x3 or auto-16x9, then bits b0, b1, and b2 of data group 1 will be used to set the aspect ratio and Active Format Description (AFD) of the video in the MPEG stream. This information can be used by a decoder to insert video index information in the output signal.

wst This value specifies World System Teletext. The transmission format can be configured to conform to ETSI EN-300-472, to ETSI EN-301-775, or to both standards. These standards allow the following lines to be encoded: 7 to 22 and 320 to 335, corresponding to VBI line indexes 7 to 22 in both field 1 and 2. The standards list lines outside this range as undefined or reserved. Consequently, the wst function should be specified only for lines 7 to 22 in either field. The encoder ignores wst outside this range (treats the function as none).

Depending on the closed caption source, some encoders can alternatively receive closed captions over ethernet. Only one source is active per encoder. If the encoder is not configured to use VBI lines as the closed caption source (the CC source is not {vbi}), it discards the data for VBI lines configured with the closedCaption function. Additionally, setting the CC source to {udp} overrides the line 21 function in both fields, using the same processing as {none}, regardless of the actual configured value.

VBI lines contribute data to the MPEG stream. That bandwidth must be considered when setting a program's total rate. Generally, lines with the same function share overhead. The following table uses num_lines to represent the number of lines configured to the given function per frame. The formulas conservatively use 30 frames/second, which is no slower than any actual video frame rate. This avoids underestimating the required bandwidth.

Note 1: * Availability of this selection is determined by the module's feature profile.
See Table 14-6, "ENC-S11 Module Type Definitions" on page 106. See also util key .

Note 2: The encoder's 'simode' (cfg slot.s/enc.m/pgm simode) setting may affect this parameter.

Intro/Update: 4.0.0/5.7.0

cfg slot.s/enc.m/vbi/fld.f/lin.l **testpattern**

Value(s): none, ntsc-75colorbars, ntsc-100colorbars, ntsc-combination, ntsc-composite, ntsc-eq, ntsc-flat, ntsc-pll, ntsc-ramp, ntsc-sinx, pal-ccir17, pal-ccir18, pal-ccir330, pal-ccir331, pal-75colorbars, pal-100colorbars, pal-eq, pal-its1, pal-its2, pal-flat, pal-pll, pal-ramp, pal-sinx

Description: Specifies the VBI line test pattern to transmit to the decoder.

Note 1: On every line that is to transmit a test pattern, the cfg slot.s/enc.m/vbi/fld.f/lin.l function to be set to "testpattern"; otherwise the setting is ignored.

Note 2: On every line that is to transmit a test pattern, the pattern that is to be used must be specified.

Intro/Update: 4.0.0/5.2.0

23.1.22 ENC VBI Configuration Parameters

cfg slot.s/enc.m/vbi

slot.s s = Slot number.

3–17 SYS-1700's range of application module slot numbers.

2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

Use this configuration parameter to modify for alarm notification.

cfg slot.s/enc.m/vbi **vbittx**

Value(s): dual, en-300-472, en-301-775

Description: Specifies how to transmit DVB teletext for all VBI lines configured as WST. Two standards govern the format of DVB teletext, EN-301-775and EN-300-472. Although EN-301-775 supersedes the earlier EN-300-472, some receivers were manufactured before the newer standard was available. Consequently, they are unable to decode the newer teletext format in EN-301-775.

dual Transmit System B Teletext in both a separate PES and in a new PES combined with other VBI information. This mode supports systems broadcasting to a population with old decoders conforming to EN-300-472 and new decoders conforming to EN-301-775. This mode requires twice as much bandwidth within the transport stream to support teletext.

en-300-472 Transmit System B Teletext in a separate PES, as described in EN-300-472. EN-300-472: Specification for conveying ITU-R System B Teletext in DVB bit streams (1997);

en-301-775 Transmit System B Teletext combined in the same PES with other VBI information, as described in EN-301-775. EN-301-775: Specification for the carriage of Vertical Blanking Information (VBI) data in DVB bit streams (2000).

Intro/Update: 6.0.0/6.5.0

23.1.23 ENC VBI Teletext Configuration Parameters

cfg slot.s/enc.m/vbi/ttxdesc.d

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

ttxdesc.dd = Index number in the teletext descriptor table.
- 1–16 Range of Teletext Table entries.

Use this configuration parameter to modify for alarm notification.

cfg slot.s/enc.m/vbi/ttxdesc.d **langcode**

Value(s): ISO Language Code

Description: Specifies the teletext descriptor language code. Following ETSI EN 300 468, Enhanced Teletext specification, entries in the Teletext description table specify descriptors that are inserted into the Program Map Table (PMT) for this program.

This variable corresponds to the ISO_639_language_code field of the teletext descriptor, conforming to ISO 639.2/B or ISO 639.2/T.

See the teletext descriptor type for additional information.

Intro/Update: 6.5.0/6.5.0

cfg slot.s/enc.m/vbi/ttxdesc.d **magazinenum**

Value(s): 1 to 8

Description: Specifies the teletext descriptor magazine number. Following ETSI EN 300 468, Enhanced Teletext specification, entries in the Teletext description table specify descriptors that are inserted into the Program Map Table (PMT) for this program.

This variable corresponds to the teletext_magazine_number field of the teletext descriptor.

See the teletext descriptor type for additional information.

Intro/Update: 6.5.0/6.5.0

cfg slot.s/enc.m/vbi/ttxdesc.d **pagenum**

Value(s): 00 to ff (0 to 255, represented as 2 hexadecimal digits)

Description: Specifies the teletext descriptor page number. Following ETSI EN 300 468, Enhanced Teletext specification, entries in the Teletext description table specify descriptors that are inserted into the Program Map Table for this program.

This variable corresponds to the teletext_page_number field of the teletext descriptor.

See the teletext descriptor type for additional information.

Intro/Update: 6.5.0/6.5.0

cfg slot.s/enc.m/vbi/ttxdesc.d **type**

Value(s): 0x00 to 0x1f

Description: Specifies the teletext descriptor type. Following ETSI EN 300 468, Enhanced Teletext specification, entries in the Teletext description table specify descriptors that are inserted into the Program Map Table for this program.

This variable corresponds to the teletext_type field of the teletext descriptor, described by ETSI EN 300 468, Table 70.

Table 23-9 Teletext Type Values and Descriptors

Value	Description
0x00	Reserved for future use.
0x01	Initial teletext page.
0x02	Teletext subtitle page.
0x03	Additional information page.
0x04	Program schedule page.
0x05	Teletext subtitle page for hearing impaired people.
0x06 to 0x1f	Reserved for future use.

As a reserved value, zero serves as a special marker for the entire descriptor. If the type is zero, the encoder does not insert the descriptor into the MPEG stream. Even when the type is non-zero, the encoder inserts a descriptor only when the program stream actually carries teletext data.

A program's SI-PSI mode must be set to DVB to carry teletext correctly. Other values of the SI-PSI mode suppress both teletext and the teletext descriptors.

Intro/Update: 6.5.0/6.5.0

23.1.24 ENC Video Configuration Parameters

cfg slot.s/enc.m/vid

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

Use the configuration parameters in this branch to modify encoder video settings.

cfg slot.s/enc.m/vid **afd**

Value(s): 0 to 15

Description: Use this parameter to specify the default Active Format Description (AFD). As described by the aspect ratio, a transport stream can carry information describing the source and the display aspect ratios. When the encoder inserts an AFD without information from the input signal, this value provides the active_format to use.

See ETSI TR 101 154 V1.4.1 (2000-07), Digital Video Broadcasting (DVB); Implementation guidelines for the use of MPEG-2 Systems; Video and Audio in satellite, cable and terrestrial broadcasting applications. The following options (except for 'none') are from Annex B of that specification.

none	This value explicitly indicates not to insert AFD, unless the input stream carries aspect ratio information.
afd-0 to afd-1	Reserved
afd-2	box 16:9 (top)
afd-3	box 14:9 (top)
afd-4	box > 16:9 (center)
afd-5 to afd-7	Reserved
afd-8	Active format is the same as the coded frame
afd-9	4:3 (center)
afd-10	16:9 (center)
afd-11	14:9 (center)
afd-12	Reserved
afd-13	4:3 (with shoot & protect 14:9 center)
afd-14	16:9 (with shoot & protect 14:9 center)
afd-15	16:9 (with shoot & protect 4:3 center)
drop	This value explicitly indicates to drop AFD, even if the input stream carries aspect ratio information. This, however, does not impact the VANC DID filter setting.

Intro/Update: 7.5.0/8.1.1

cfg slot.s/enc.m/vid **aspect**

Value(s): 4x3, 16x9, auto-4x3, auto-16x9

Description: Use this paramter to specify the video aspect ratio. Although this does not imply a format conversion by the encoder, it does allow the encoder to put the given aspect ratio into the MPEG stream. A decoder could use this information to display the material appropriately, preserving the aspect ratio from the input camera to the output monitor.

An Active Format Description (AFD) (see cfg slot.s/enc.m/vid afd above) carries information about the picture, in addition to the aspect ratio. Decoders can use the AFD to match the stream's video to display characteristics, or to insert video index information in the outgoing signal. When a stream carries AFD, many decoders use that information exclusively, ignoring the decoder's configuration specific to the attached display. Undesireable results can occur when the actual aspect ratio of the encoder's video source does not match the aspect ratio configured for the encoder.

aspect-4x3 The input has the (standard definition) 4 by 3 aspect ratio.

aspect-16x9 The input has the widescreen aspect ratio of 16 by 9.

auto-4x3 Automatically detects the aspect ratio from the source. If that value is not available, uses 4x3.

auto-16x9 Automatically detects the aspect ratio from the source. If that value is not available, uses 16x9.

Note 1: When the fixed aspect ratios such as ‘aspect-4x3’, or ‘aspect-16x9’ are used, the encoder inserts AFD according to the configured default value. In case of a mismatch between the encoder input and the configured aspect ratio, the decoder's display properties are allowed to take priority.

Note 2: When the automatic ratios ‘auto-4x3’, ‘auto-16x9’ tell the encoder to examine the input for aspect ratio information and use that to build the AFD. If dynamic source information is unavailable, the automatic ratios inserts the configured default value.

Note 3: The default value of {none} suppresses the AFD.

Intro/Update: 2.0.0/7.5.0

cfg slot.s/enc.m/vid **dyngop**

Value(s): enable, disable

Description: Use this control to enable or disable dynamic GOP length.

enable The encoder may vary the length of a GOP to align with a scene change.

disable The encoder always produces the configured GOP.

Intro/Update: 8.5.1/8.5.1

cfg slot.s/enc.m/vid **filmdet**

Value(s): enable, disable

Description: Enables/disables film mode detection. Film is normally shot at 24 frames/sec, compared to 25 frames/sec for PAL, (about) 30 interlaced frames/sec for NTSC, and (about) 60 progressive frames/sec for 720P. Transferring film material to 30 or 60 frames/sec uses a process called 3:2 pulldown. For every pair of film frames, 5 interlaced fields (or progressive frames) are generated. The first frame has 3 fields, with the first and third identical. The second frame has 2 fields. (Two film frames at 24 frames/sec take the same time as five fields at 30 frames/sec.) The encoder can work more efficiently if it recognizes the repetition pattern, and this parameter tells the encoder how to process the source material.

If the input material is not appropriate for 3:2 pulldown (24 or 25 Hz input), the encoder ignores the film mode setting. (The difference between 24 and 25 frames/sec is small enough to ignore, and 3:2 pulldown is not used.)

enable Expect input to be film or video; the encoder chooses the appropriate encoding for the source material. The encoder will switch between film and video mode if the 3:2 repetition pattern persists or ceases for a long enough time.

disable Don't attempt to identify the film mode repetition sequence.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/enc.m/vid **framerate**

Value(s): auto, 5, 10, 15, 25, 30

Description: This parmeter specifies the coded frame rate in frames per second. Most often, the coded picture rate (output frames/sec) matches the input, but this parameter gives a way to code fewer pictures. This approach is typically used for low-bandwidth applications, such as mobile receivers.

auto This value tells the encoder to code all the pictures it receives. The coded frame rate matches the input frame rate.

5, 10, 15, 25, 30 These values tell the encoder to generate coded frames at the indicated rate (in frames/sec). The values are close approximations to the actual frame rate. For example, NTSC input operates at 29.97 frames/sec, but frame-30 is treated as equivalent.

Note 1: This parameter is only available when the encoder's 'SI Mode' (cfg slot.s/enc.m/pgm simode) is set to 'ISDB-Tb'.

Note 2: The video input source and resolution constrain the appropriate values for this parameter. See Table 23-11, "Input Resolution, Standards, Possible Frame Rate Settings, and Coded Lines Per Field" on page 234.

Intro/Update: 7.3.0/7.8.0

cfg slot.s/enc.m/vid **gop**

Value(s): gop-IP, gop-IP-low, gop-1B-closed, gop-1B-open, gop-2B-closed, gop-2B-open

Description: Specifies the GOP structure. This variable provides composite information on the GOP structure, including the picture types and whether the GOPs should be open or closed.

An MPEG-2 group of pictures contains I-, P-, and B-frames, with an I-frame as the first picture in the bit stream, but an I- or B-frame as the first picture in display order. An open GOP allows B-frames to reference pictures in other GOPs. Although this approach allows more efficient encoding, it also means a GOP is not self-contained, because a B-frame may need an I-frame in the previous GOP to decode properly. Some applications, such as storing video clips on a server, require closed GOPs, allowing each GOP to be decoded independently.

The NetVX™ handles this condition by manipulating the I-frame spacing. Technically, MPEG-2 allows an encoder to construct B-frames that reference only preceding or following pictures (in display order). Thus a closed GOP could be constructed by preventing a B-frame from referencing pictures outside its GOP. Alternatively, the encoder can force every GOP to begin with an I-frame and to end with an I-frame or a P-frame in display order, thus ensuring all B-frames have both a backward and a forward picture to reference from their own GOP. The NetVX™ uses this second method when generating closed GOPs.

gop-IP This value tells the encoder to generate P-frames but no B-frames (IPPP...).

gop-IP-low This value tells the encoder to use only I-frames and P-frames, with encoding suitable for a low-latency service.

gop-1B-closed, gop-1B-open These values tell the encoder to generate 1 B-frame between I and P-frames (IBPBP...). The GOP is either open or closed, as noted.

gop-2B-closed, gop-2B-open These values tell the encoder to generate 2 B-frames between I and P-frames (IBBPBBP...). The GOP is either open or closed, as noted.

gop-2B-closed-low
gop-2B-open-low These values tell the encoder to generate 2 B-frames between I and P-frames (IBBPBBP...). The GOP will be open or closed, as noted. The encoding will be suitable for a low latency service.

gop-3BH-closed, gop-3BH-open These values tell the encoder to generate 3 B-frames between I- and P-frames, using 2-level hierarchical encoding. The GOP will be open or closed, as noted. Unlike MPEG-2, which does not use B-frames to predict other pictures, H.264 allows a 2-level hierarchy, and the center of three consecutive B-frames helps predict the B-frames adjacent to it. Using R to represent referenced B-frames, the 2-level hierarchy could code pictures with the following sequence: IBRBPBRBP....

gop-7BH-closed, gop-7BH-open These values tell the encoder to generate 7 B-frames between I- and P-frames, using 3-level hierarchical encoding. The GOP will be open or closed, as noted. Unlike MPEG-2, which does not use B-frames to predict other pictures, H.264 allows a 3-level hierarchy, and intermediate B-frames help predict other B-frames adjacent to them. Using R to represent referenced B-frames, the 3-level hierarchy could code pictures with the following sequence: IBRBRBRBPBRBRBRBP....

Note 1: The input selection (cfg slot.s/enc.m/vid input) determines which of two fixed GOP sizes should be used. The encoder creates 15-frame GOPs when encoding NTSC and 12-frame GOPs when encoding PAL.

Note 2: MPEG-2 anchors prediction points at I-frames and P-frames. Intervening B-frames reference only the closest the I- and P-frame pictures. H.264 relaxes these restrictions, allowing B-frames to reference I- and P-frames that are outside their closest neighbors (in addition to other B-frames). This flexibility alters the notion of open and closed GOPs and affects the placement of edit points in the video stream. As a

practical matter, the system's H.264 encoders currently limit their use of the full H.264 facilities. The encoders insert a recovery point SEI message at each I-frame, providing synchronization points for downstream applications (decoders, editors, etc.).

Intro/Update:2.0.0/7.0.0

cfg slot.s/enc.m/vid **gopsize**

Value(s): short, medium, long (See last three columns in table below for meanings)

Description: This variable specifies the GOP length. Encoders treat the specified value as a suggestion of intent, not a rule. They can vary the actual GOP size based on input material, hardware capabilities. Typical values are presented in the table below.

Table 23-10 Nominal GOP Size Based on 'Encoder', 'Input Signal', 'GOP Structure' and 'GOP Size' Setting

Encoder Type	Input Signal	GOP Structure	GOP Size Setting				
			'Short'	'Medium'	'Long'	Very-Long	Ultra-Long
ENC-A21	NTSC PAL SDI (SD) 480I 1080I	I	1	1	1	1	1
		IP 1B 2B	12	24	30	60	90
		3BH 7BH	8	16	32	48	64
	720P	I	1	1	1	1	1
		IP 1B 2B	24	48	60	120	180
		3BH 7BH	16	32	64	96	128
ENC-A11 ENC-H11 ENC-S11 ENC-S21	NTSC PAL SDI (SD) 480I 1080I	I	1	1	1	1	1
		IP 1B 2B	6	12	15	30	45
		3BH 7BH	N/A	N/A	N/A	N/A	N/A
	720P	I	1	1	1	1	1
		IP 1B 2B	12	24	30	60	90
		3BH 7BH	N/A	N/A	N/A	N/A	N/A

Note 1: We have found longer GOPs to be more effective for faster frame rates.

Note 2: The ENC-A11 and ENC-A21 use variable-sized GOPs, depending on the dynamic video characteristics. The size ranges from 1 to 20 for short, from 1 to 30 for medium, and from 1 to 60 for long.

Note 3: An encoder can adjust the values above to account for open or closed GOP structure.

Note 4: The ENC-S11 treats 'very-long' and 'ultra-long' the same as 'long'.

Intro/Update:5.6.0/8.1.0

cfg slot.s/enc.m/vid **input**

Value(s): ENC-H11 Inputs: sdi-525, sdi-625, black-525, black-625, black-720-59, black-1080-25, black-1080-29, sdi-720-59, sdi-1080-25, sdi-1080-29
ENC-S11/ENC-S21 Inputs: black-525, black-625, comp-ntsc, comp-ntsc-j, comp-pal, comp-pal-m, sdi-525, sdi-625

Description: Identifies the source and type of video input. The SD encoders create 15-frame GOPs when encoding NTSC and 12-frame GOPs when encoding PAL. Note that while the lists below are comprehensive, they do not suggest that an SD encoder can generate or code an HD signal, rather all possible options for this parameter are listed.

auto In automatic mode, the encoder first looks for digital input. Failing that, it looks for analog input. Failing that, it codes black (black-525 for ENC-S11 and ENC-S21, black-1080-29 for ENC-H11). Once the encoder acquires a video signal, it stays with that input as the signal is present. If the signal drops, however, the encoder goes through the entire acquisition sequence again.

Black Options

The following values cause the encoder to generate a black signal at the desired resolution and frame rate. When any of these black-generating modes are used, the input signal is ignored.

black-525 Use this setting to create an NTSC-compliant black signal.

black-625 Use this setting to create a PAL-compliant black signal.

black-720-50 Use this setting to create a 720p HD/50 fps. black signal.

black-720-59 Use this setting to create a 720p HD/59.94 fps. black signal.

black-1080-24sf Use this setting to create a 1080-segmented frame HD 24 fps. black signal.

black-1080-25 Use this setting to create a 1080i HD/25 fps. black signal.

black-1080-29 Use this setting to create a 1080i HD/29.97 fps. black signal.

Composite Input Options

These values tell the encoder to use its analog input, processing the signal according to the indicated standard

comp-auto This value tells the encoder to use its analog input but to detect the standard automatically. The encoder will not use the digital input, even if no analog signal is present.

comp-ntsc, Use this setting with composite NTSC input.

comp-ntsc-j Use this setting with composite NTSC-J input.

comp-pal Use this setting with composite PAL input.

comp-pal-m Use this setting with composite PAL-M input.

Serial Digital Input (SDI) Options

sdi-525, Use this setting with a PAL-compliant 525-line SDI input.

sdi-625 Use this setting with a PAL-compliant 625-line SDI input.

sdi-720-59 Use this setting with 720-line HD material created at a frame rate of 59 fps.

sdi-1080-24sf Use this setting with 1080-line HD material created using 24 segemented frame.

sdi-1080-25 Use this setting with 1080-line HD material created at a frame rate of 25 fps.

sdi-1080-29 Use this setting with 1080-line HD material created at a frame rate of 29 fps.

sdi-auto Using this setting, the encoder uses its digital input but to detect the standard automatically. It will not use the analog input, even if no digital signal is present.

Note 1: When using any of the automatic modes, the encoder tries to acquire a signal on the allowed interfaces. If no signal is present, it (arbitrarily) uses black-525 as its input.

Note 2: * Availability of this selection is determined by the module's feature profile.
See Table 14-6, "ENC-S11 Module Type Definitions" on page 106. See also util key .

Note 3: The encoder's 'simode' (cfg slot.s/enc.m/pgm simode) setting may affect this parameter.

Note 4: The High Definition resolutions: auto, black-1080-24sf, sdi-1080-24sf, sdi-auto are not available in release 6.5.

Intro/Update:2.0.0/7.0.0

cfg slot.s/enc.m/vid **minquant**

Value(s): 1 to 51 on the ENC-A21
1 to 31 on the ENC-H11, ENC-S11, or the ENC-S21

Description: Specifies the encoder's minimum quantization value.

1 The encoder chooses its own quantization values.

2–31 The encoder attempts to use the specified value.

Note: This parameter is only supported on ENC-A21, ENC-H11, ENC-S11, and on the ENC-S21.

Intro/Update:2.0.0/7.6.0

cfg slot.s/enc.m/vid **offset**

Value(s): -2 to -1, 0, 1 to 2

Description: Specifies the number of lines to shift the first line of encoded video. The remaining lines are subsequently offset by this amount as well.

-2 Encoded video begins on line 24. This setting makes the image on a monitor shift down two lines from the default.

-1 Encoded video begins on line 23. This setting makes the image on a monitor shift down one line from the default.

0 Encoded video begins on line 22. This setting is the default.

1 Encoded video begins on line 21. This setting makes the image on a monitor shift up one line from the default.

2 Encoded video begins on line 20. This setting makes the image on a monitor shift up two lines from the default.

Note: This setting does not affect VBI line settings or the overall number of lines received by decoders.
See Table 1, "* Availability of this selection is determined by the module's feature profile. See Table 14-6, "ENC-S11 Module Type Definitions" on page 106. See also util key ." on page 234 for possible settings and their implications.

Intro/Update:2.0.0/6.5.1

cfg slot.s/enc.m/vid **preproc**

Value(s): auto, none, sharp, soft

Description: Specifies the video pre-processing to apply. Depending on the program rate and other properties of the video, some pre-processing can help improve the apparent picture quality. This value tells the encoder what set of video pre-processing to use.

auto This value lets the encoder select its own pre-processing. Typically, the encoder will vary the filters to make the picture look good to the eye.

none This value disables video pre-processing. Disabling pre-processing sometimes helps preserve details of the original input. This setting can improve the results of some measurement equipment, even though the picture might look worse to a human.

sharp This value lets the encoder select its own pre-processing, giving preference to preserving sharp edges and picture detail. Compared with soft, this may sometimes introduce blocky artifacts, when the video complexity exceeds the available bandwidth to convey the detail.

soft This value lets the encoder select its own pre-processing, giving preference to reducing blocky coding artifacts. Compared with sharp, this may sometimes blur fine detail when the video complexity exceeds the available bandwidth to convey the detail.

Note: This paramter is applicable only to the ENC-H11 and ENC-A21.

Intro/Update: 6.6.0/7.8.0

cfg slot.s/enc.m/vid **progrefresh**

Value(s): none, prog_mb, rand_mb, prog_i, rand_i, gop_only

Description: Specifies the type of progressive refresh the encoder should use.

None Encoder does not use progressive refresh.

prog_mb Select progressive I macroblock refresh.

rand_mb Select random I macroblock refresh.

prog_i Select progressive I macroblock refresh with IDR frames.

rand_i Select random I macroblock refresh with IDR frames.

gop_only **Note:** Add occassional I-frames with no progressive refresh.ENC-A21.

Intro/Update: 8.4.0/8.4.0

cfg slot.s/enc.m/vid **res**

Value(s): See values in the "Standard/Extended" column below.

Description: This parameter specifies the video standard/vertical resolution, horizontal resolution, and chroma format. Some applications, such as ISDB-Tb, require the possibility of setting the coded frame rate to a value lower that the input frame rate. The array of possible settings for this application are provided in the 'Coded Frame Rate' column.

Note 1: * Availability of this selection is determined by the module's feature profile.

Table 23-11 Input Resolution, Standards, Possible Frame Rate Settings, and Coded Lines Per Field

Format	Input	Standard/ Extended Resolution-Chroma	Coded Frame Rate* (*ENC-S11 only)	Resolution Support by Module					Coded Lines	
				ENC-H11	ENC-S21	ENC-S11	ENC-A11	ENC-A21	Field 1	Field 2
High-Definition, 720p	black-720-50 black-720-59 sdi-720-50 sdi-720-59	std-640-420	Frame-Auto						26 to 745	n/a
		std-960-420								
		std-1280-420								
		std-1280-422								
High-Definition, 1080i	black-1080-25 black-1080-29 sdi-1080-25 sdi-1080-29	std-960-420	Frame-Auto						21 to 560	584 to 1123
		std-1280-420								
		std-1440-420								
		std-1440-422								
		std-1920-420								
		std-1920-422								
High-Definition, 1080-film Segmented Frame	black-1080-24sf sdi-1080-24sf	std-960-420	Frame-Auto						21 to 560	584 to 1123
		std-1280-420								
		std-1440-420								
		std-1440-422								
		std-1920-420								
		std-1920-422								
Standard Definition NTSC Reduced (120 Lines)	black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	qcif-176-420	5, 10, 15, 25, 30 fps						22 to 261	n/a
Standard Definition NTSC Reduced (240 Lines)	black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	cif-352-420	5, 10, 15, 25, 30 fps						22 to 261	n/a
Standard Definition, NTSC Standard (480 Lines)	black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	std-352-420	Frame-Auto						22 to 261	285 to 524
		std-480-420								
		std-528-420								
		std-544-420								
		std-640-420								
		std-704-420								
		std-720-420								
		std-720-422								

Table 23-11 Input Resolution, Standards, Possible Frame Rate Settings, and Coded Lines Per Field

Standard Definition, NTSC Extended (512 Lines)	black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	ext-720-420	5, 10, 15, 25, 30 fps						7 to 262	270 to 525
		ext-720-422								
Standard Definition, PAL Reduced (144 Lines)	black-625 comp-pal sdi-625	cif-176-420	5, 10, 15, 25 fps				Future		23 to 310	n/a
Standard Definition, PAL Reduced (288 Lines)	black-625 comp-pal sdi-625	cif-352-420	5, 10, 15, 25 fps						23 to 310	n/a
Standard Definition, PAL Standard (576 Lines)	black-625 comp-pal sdi-625	std-352-420	Frame-Auto						23 to 310	336 to 623
		std-480-420								
		std-528-420								
		std-544-420								
		std-640-420								
		std-704-420								
		std-720-420								
		std-720-422								
Standard Definition, PAL Extended (608 Lines)	black-625 comp-pal sdi-625	std-720-420	Frame-Auto						7 to 310	320 to 623
		std-720-422								
Standard Definition VGA Reduced 16:9 Aspect Ratio (96 lines)	black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	sqvga-160-420	5, 10, 15, 25, 30 fps						22 to 261	NA
	black-625 comp-pal sdi-625	sqvga-160-420	5, 10, 15, 25 fps						23 to 310	NA
Standard Definition VGA Reduced 4:3 Aspect Ratio (120 lines)	black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	sqvga-160-420	5, 10, 15, 25, 30 fps						22 to 261	NA
	black-625 comp-pal sdi-625	sqvga-160-420	5, 10, 15, 25 fps						23 to 310	NA
Standard Definition VGA Reduced 16:9 Aspect Ratio (192 lines)	black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	qvga-320-420	5, 10, 15, 25, 30 fps						22 to 261	NA
	black-625 comp-pal sdi-625	qvga-320-420	5, 10, 15, 25 fps						23 to 310	NA
Standard Definition VGA Reduced 4:3 Aspect Ratio (240 lines)	black-525 comp-ntsc comp-ntsc-j comp-pal-m sdi-525	qvga-320-420	5, 10, 15, 25, 30 fps						22 to 261	NA
	black-625 comp-pal sdi-625	qvga-320-420	5, 10, 15, 25 fps						23 to 310	NA

See Table 14-6, "ENC-S11 Module Type Definitions" on page 106. See also util key .

Note 2: The encoder's 'simode' (cfg slot.s/enc.m/pgm simode) setting may affect the options available for this parameter.

Intro/Update: 2.0.0/7.4.0

cfg slot.s/enc.m/vid **state**

Value(s): ON, OFF

Description: Use this control to enable or disable the specified program's video elementary stream.

ON Video enabled.

OFF (Available in a future release) Video disabled.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/enc.m/vid **vbrselect**

Value(s): enable, disable

Description: Use this control to enable or disable variable bit rate encoding.

enable The encoder eliminates padding needed to produce the configured TS rate.

disable The encoder always produces the configured TS rate.

Intro/Update: 8.5.1/8.5.1

cfg slot.s/enc.m/vid **viddeg**

Value(s): enable, disable

Description: Video Error Alarm Enable.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/enc.m/vid **vidflt**

Value(s): enable, disable

Description: Video LOS Alarm Enable.

Note: Use the cfg sys/alm vidFltSev command to set this alarm's severity level.

Intro/Update: 2.0.0/2.0.0

23.1.25 ENC Video Router Configuration Parameters

cfg slot.s/enc.m/vid/rtr

slot.s s = Slot number.

- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

Use these configuration parameters to modify encoder video router settings.

cfg slot.s/enc.m/vid/rtr **in**

Value(s): 1–n (n = the number of router inputs)

Description: Specifies the router (input) port receiving its signal directly from the video source. Example: On a 12x1 router, valid values for this item would range from 1 to 12.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/enc.m/vid/rtr **lvl**

Value(s): 0 to 15

Description: Specifies the router level to associate with this signal.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/enc.m/vid/rtr **out**

Value(s): 1–n (n = the number of router outputs)

Description: Specifies the router (output) port connected directly to ENC-S11 module's video input jack. Example: On a 12x1 router, "1" is the only valid "out" value.

Intro/Update: 2.2.0/3.3.0

23.1.26 SYS, General Slot Configuration Parameters

cfg slot.s/gen

slot.s s = Slot number.
3–17 SYS-1700's range of application module slot numbers.
2–4 SYS-200/SYS-300's range of application module slot numbers.

Use these configuration parameters to modify general slot settings.

cfg slot.s/gen **atmVcResMax**

cfg slot.s/gen **atmVcResMin**

Value(s): 0 to 255

Description: These values jointly specify a reserved range of ATM virtual channel table indexes. When allocating new table entries, an element manager should select entries outside the reserved range. No explicit mechanism designates the "owner" of a reserved range; applications are assumed to understand their roles in the reservation scheme. The value zero indicates no reserved minimum or maximum.

Note: The system asserts an alarm (modDeg, Configuration Error) if the range is invalid: only one non-zero value or the maximum less than the minimum.

Intro/Update: 8.0.0/8.0.0

cfg slot.s/gen **cfgTag**

Value(s): Any text string up to 31 characters.

Description: Specifies a name for the current slot profile. This command works in conjunction with util profile. When a profile is saved, While util profile specifies the branch to profile, and the index number to save the profile under, cfg slot.s/gen cfgTag supplies a tag to name the profile.

See Section 22.6, "Overview of NetVX™ Tags" on page 159

Note: Be sure to see util profile for important details about this feature.

Intro/Update: 4.0.0/4.0.0

cfg slot.s/gen **ipVcResMax**

cfg slot.s/gen **ipVcResMin**

Value(s): 0 to 255

Description: These values jointly specify a reserved range of ATM virtual channel table indexes. When allocating new table entries, an element manager should select entries outside the reserved range. No explicit mechanism designates the "owner" of a reserved range; applications are assumed to understand their roles in the reservation scheme. The value zero indicates no reserved minimum or maximum.

Note: The system asserts an alarm (modDeg, Configuration Error) if the range is invalid: only one non-zero value or the maximum less than the minimum.

Intro/Update: 8.0.0/8.0.0

cfg slot.s/gen **muxDxVcResMax**

cfg slot.s/gen **muxDxVcResMin**

Value(s): 0 to 255

Description: These values jointly specify a reserved range of ATM virtual channel table indexes. When allocating new table entries, an element manager should select entries outside the reserved range. No explicit mechanism designates the "owner" of a reserved range; applications are assumed to understand their roles in the reservation scheme. The value zero indicates no reserved minimum or maximum.

Note: The system asserts an alarm (modDeg, Configuration Error) if the range is invalid: only one non-zero value or the maximum less than the minimum.

Intro/Update: 8.0.0/8.0.0

cfg slot.s/gen **muxMxVcResMax**

cfg slot.s/gen **muxMxVcResMin**

Value(s): 0 to 255

Description: These values jointly specify a reserved range of ATM virtual channel table indexes. When allocating new table entries, an element manager should select entries outside the reserved range. No explicit mechanism designates the "owner" of a reserved range; applications are assumed to understand their roles in the reservation scheme. The value zero indicates no reserved minimum or maximum.

Note: The system asserts an alarm (modDeg, Configuration Error) if the range is invalid: only one non-zero value or the maximum less than the minimum.

Intro/Update: 8.0.0/8.0.0

cfg slot.s/gen **protMode**

Value(s): unprotected, protectedBy-2, protectedBy-3…protectedBy-17, backup

Description: Specifies the role of the module in the selected slot.

unprotected Indicates the module is operating as a main module. The module does not have a backup configured.

protectedby-# Indicates the module is operating as a main module and is protected by the module in located in the slot specified by “#”. Also, the module in the indicated slot is configured to operate as this module’s backup.

backup Indicates the module is operating as a backup module.

Intro/Update: 2.2.0/5.0.0

cfg slot.s/gen **rtrSerPort**

Value(s): 1, 2

Description: Specifies the auxiliary serial port that the module in the selected slot should use to issue router commands when operating in protection mode.

0 This backup module does not use a serial port to communicate with a router in the event of a failover of a failback.

1 This backup module use the NetVX™'s “Serial Port 1" to convey failover and failback control signals.

2 This backup module use the NetVX™'s “Serial Port 2" to convey failover and failback control signals.

Intro/Update: 2.2.0/3.3.0

cfg slot.s/gen **state**

Value(s): enable, disable

Description: Specifies whether this module is enabled for operation.

Intro/Update: 2.0.0/2.0.0

cfg slot.s/gen **type**

Value(s): none, unknown,
atm-l11, atm-l11-1, atm-l11-1a1, atm-l11-2, atm-l11-2a1,
atm-m11, atm-m11-1, atm-m11-1a1, atm-m11-2, atm-m11-2a1,
atm-s11, atm-s11-1, atm-s11-1a1, atm-s11-2, atm-s11-2a1,
atm-x11, atm-x11-1, atm-x11-1a1, atm-x11-2, atm-x11-2a1,
aud-d14, aud-d14-dec, aud-d14-enc-d, aud-d14-enc-m, aud-d14-enc-dm,
dec-s11, dec-s11-std, dec-s11-std-d, dec-s11-pro, dec-s11-pro-d,
enc-a11, enc-a11-sd, enc-a11-sd-bl, enc-a11-sd-d, enc-a11-sd-dc, enc-a11-sd-dp, enc-a11-sd-m, enc-a11-sd-mc, enc-a11-sd-mp, enc-a11-sd-p,
enc-a21, enc-a21-hd, enc-a21-hd-d, enc-a21-hd-dc, enc-a21-hd-dm, enc-a21-hd-dmc, enc-a21-hd-dp, enc-a21-hd-m, enc-a21-hd-mc, enc-a21-hd-mp, enc-a21-hd-p,
enc-a21-sd, enc-a21-sd-d, enc-a21-sd-dc, enc-a21-sd-dm, enc-a21-sd-dmc, enc-a21-sd-dp, enc-a21-sd-m, enc-a21-sd-mbl, enc-a21-sd-mc, enc-a21-sd-mp, enc-a21-sd-p,
enc-h11, enc-h11-std-d, enc-h11-std-m, enc-h11-pro-d, enc-h11-pro-dc, enc-h11-pro-dm, enc-h11-pro-dmc, enc-h11-pro-m, enc-h11-pro-mc,
enc-s11, enc-s11-util-m, enc-s11-util-sm, enc-s11-uvb-m, enc-s11-std-d, enc-s11-std-dc, enc-s11-std-m, enc-s11-std-mc, enc-s11-pro-d, enc-s11-pro-dc, enc-s11-pro-dm, enc-s11-pro-dmc, enc-s11-pro-m, enc-s11-pro-mc,
enc-s21, enc-s21-std-d, enc-s21-std-dm, enc-s21-std-m,
gbe-c11, gbe-c11-lan, gbe-c11-lants, gbe-c11-std, gbe-c11-vipa,
sys-a12, sys-a12-std, sys-a22, sys-a22-std, sys-g10, sys-g10-std,
tmx-m12, tmx-m12-bce, tmx-m12-mph, tmx-m12-mux, tmx-m12-tnl1, tmx-m12-tnl2,
tmx-m14, tmx-m14-tnl4,
tmx-m22, tmx-m22-tr8 ,

Description: Specifies the configured module type for this slot. Software keys define each module's feature profile. Software keys are factory-programmed into each module. Use the util key command in conjunction with a valid key to change a module's feature profile.

The following tables define application module feature profiles.

Table 11-2, "ATM-M11 and ATM-S11 Module Type Definitions" on page 86
Table 12-2, "ATM-X11 Module Type Definitions" on page 93
Table 13-4, "GBE-C11 Gigabit Ethernet Network Interface Module Parts List" on page 100
Table 14-6, "ENC-S11 Module Type Definitions" on page 106.
Table 15-6, "ENC-S21 Module Type Definitions" on page 117
Table 16-2, "ENC-H11 Module Type Definitions" on page 124
Table 17-2, "ENC-A21 Module Type Definitions" on page 130
Table 18-2, "AUD-D14 Module Type Definitions" on page 136
Table 19-5, "DEC-S11 Module Type Definitions" on page 142
Table 20-2, "TMX-M12 Module Type Definitions" on page 148
Table 21-2, "TMX-M14 Module Type Definitions" on page 154

Intro/Update: 2.0.0/8.0.0

23.1.27 SYS, Slot Control Configuration Parameters

cfg slot.s/ctl.m

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200 range of application module slot numbers.
- 3–4 SYS-300's range of application module slot numbers.

ctl.m m = Auxiliary audio codec number.
- 1–4 AUD-D14 range of auxiliary audio codecs.

Use these configuration parameters to modify slot control settings associated with the AUD-D14 module.

cfg slot.s/ctl.m **assocMode**

Value(s): associated, standalone

Description: Specifies the association mode for this auxiliary audio processor.

associated This mode associates the auxiliary audio channel with another encoder or decoder (depending on the function). The associated slot identifies an encoder or decoder that "inherits" the auxiliary facilities.

For example, suppose the function configures this auxiliary audio channel as an encoder, and the associated slot and channel are set to 5 and 1. Slot 5 should contain an encoder. This auxiliary processor's audio channel will augment the encoder's own audio set, with appropriate updates to the transport stream (the PMT, etc.).

standalone This mode directs this auxiliary audio channel to operate as an independent encoder or decoder (depending on the function). As an encoder, the channel generates a complete single program transport stream, carrying only audio. It may be cross-connected to any destination that consumes MPEG. Likewise, a decoder channel accepts a (single- or multi-program) transport stream as input, selects one audio stream from the designated program, and decodes that audio stream.

The value for the auxiliary audio channel's associated slot is ignored in standalone mode. It may be set to zero to indicate this (though zero is not required).

Note: * Availability of this selection is determined by the module's feature profile.
See Table 18-2, "AUD-D14 Module Type Definitions" on page 136. See also util key .

Intro/Update: 6.5.1/6.5.1

cfg slot.s/ctl.m **assocSlot**

Value(s): 0, 3–17 or 2–4 or 3–4 (see below)

Description: This parameter associates the auxiliary audio channel with the encoder or decoder module in the specified slot.

0 Disassociates this auxiliary audio channel from any encoder channel.

3–17 Range of possible encoder locations in the SYS-1700.

2–4 Range of possible encoder locations in the SYS-200.

3–4 Range of possible encoder locations in the SYS-300.

Note: * Availability of this selection is determined by the module's feature profile.
See Table 18-2, "AUD-D14 Module Type Definitions" on page 136. See also util key .

Intro/Update: 6.5.1/6.5.1

cfg slot.s/ctl.m **function**

Value(s): off, encode, decode

Description: Specifies the mode of operation for this auxiliary audio channel. The NetVX™'s database maintains encoder and decoder branches for each auxiliary audio channel. Parameters in both of these branches can be modified at any time regardless of the this parameter's setting.

off Disables this auxiliary audio channel for operation.

encode Enables this auxiliary audio codec to operate as an encoder.

decode Enables this auxiliary audio channel to operate as a decoder.

Note: * Availability of this selection is determined by the module's feature profile.
See Table 18-2, "AUD-D14 Module Type Definitions" on page 136. See also util key .

Intro/Update: 6.5.1/6.5.1

23.1.28 SYS, GBE DCHP Configuration Parameters

cfg slot.s/ip/dhcp.m

slot.s s = Slot number.
- 1–17 SYS-1700's range of slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dhcp.m m = Index number in the list of DHCP servers (1-10)

Use these configuration parameters to modify Dynamic Host Configuration Protocol (DHCP) settings.

cfg slot.s/ip/dhcp.m **ipaddr**

Value(s): IP address

Description: Identifies the IP address of any DHCP server accessible by this system. Up to ten DHCP servers may be specified by using a different index number for each.

Intro/Update: 4.0.0/4.0.0

cfg slot.s/ip/dhcp.m **ipmask**

Value(s): Subnet mask form.

Description: IP subnet mask of the DHCP server using the corresponding index number.

Intro/Update: 4.0.0/4.0.0

cfg slot.s/ip/dhcp.m **tag**

Value(s): Any text string up to 31 characters.

Description: Specifies a name to associate with this DHCP entry.

Note: See Section 22.6, "Overview of NetVX™ Tags" on page 159.

Intro/Update: 4.0.0/4.0.0

23.1.29 SYS, GBE IP Interface Configuration Parameters

cfg slot.s/ip/ifc.m

slot.s s = Slot number.
- 1–17 SYS-1700's range of slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

ifc.m m = Interface number.
- 1 Range of interfaces for the SYS-G10 System Controller module.
- 1–2 Range of interfaces for the SYS-A12 System Controller module.

Use these configuration parameters to modify IP-based control communications to this NetVX™ system.

cfg slot.s/ip/ifc.m **dhcp**

Value(s): enable, disable

Description: Enables/disables the ability of this interface to act as a DHCP relay agent as defined in IETF RFC 3046 (ftp://ftp.rfc-editor.org/in-notes/rfc3046.txt).

Intro/Update: (Available in a future release)

cfg slot.s/ip/ifc.m **ipaddr**

Value(s): IP Address

Description: Sets the IP address for this interface.

Intro/Update: 2.1.0/3.0.0

cfg slot.s/ip/ifc.m **ipmask**

Value(s): IP Address

Description: Sets the IP subnet mask for this interface.

Intro/Update: 2.1.0/3.0.0

cfg slot.s/ip/ifc.m **link**

Value(s): auto, electrical, optical, 10BaseT, 100BaseT, 1000BaseT

Description: Specifies the link handling for this interface.

auto Automatically negotiates an appropriate link value.
For the GBE-C11 module, this value initially selects between the electrical and optical interface, depending on which is physically present and has link connectivity.

electrical Automatically negotiates an appropriate link value. For the GBE-C11 module, this also specifically selects the electrical interface and bypasses the optical component.

10BaseT Specifies 10BaseT, full duplex on the electrical interface.

100BaseT Specifies 100BaseT, full duplex on the electrical interface.

1000BaseT Specifies 1000BaseT, full duplex on the electrical interface.

optical Automatically negotiates an appropriate link value. For the GBE-C11 module, this also specifically selects the optical interface and bypasses the electrical component.

Note 1: "Auto" and "electrical" have an identical affect on modules that do no have an optical interface.

Note 2: The "eth-1000BaseT" setting is not available on either the SYS-G10 or the SYS-A12 module.

Note 3: IMPORTANT! Care must be taken to ensure that the Ethernet ports on both the GBE-C11 and external piece of equipment are set to the same link setting; such as "Auto", or "1000 Mbps", or "100 Mbps".

Note 4: Use the "Optical" setting with optical SFP modules. Set the interface on the external piece of equipment to "Auto-Negotiate" or equivalent, before cabling the systems together.

Intro/Update: 5.2.0/7.4.0

cfg slot.s/ip/ifc.m **mode**

Value(s): access-link, trunk-minimal, trunk-full

Description: Specifies the LAN mode that this interface shall operate in.

access-link Use this setting when Video on IP will not be used on the interface. In this mode LAN Extension (VC function "lan" or "lan-ts") is supported for untagged packets (vlid 0).

trunk-minimal Use this setting when using multiple GBE interfaces in one chassis and all must be on the same subnet. This setting supports Video on IP (VIP), VLAN, ICMP, and IGMP.
This setting excludes control protocols, such as SNMP or telnet, and any IP routing.

trunk-full Use this setting when using multiple GBE interfaces in one chassis and each must be on separate subnets.
Use this setting for Video on IP (VIP), VLAN, ICMP, IGMP, SNMP, Telnet, and IP Routing. This setting supports “normal” LAN traffic (untagged Ethernet frames), in-band control. This option also supports generic IP processing (routing, SNMP, etc.) on the SYS-G10 and SYS-A12 modules. This is the default setting and it also represents the interface behavior prior to firmware release 6.5

Table 23-12 GBE-C11 IP Interface Mode Attributes

Mode Setting	Application/Usage	VC Function[1] Supported	VLAN Tags	ICMP, IGMP Protocols	SNMP, Telnet Protocols	IP Routing
Trunk-Full (GBE-C11)	Video on IP, LAN Extension, In-Band Control	All Functions[2]	Enabled	Enabled	Enabled	Enabled
Trunk-Full (SYS-G10, SYS-A12)	Video on IP, In-Band Control, Generic IP	All but “LAN”	Disabled	Enabled	Enabled	Enabled
Trunk Minimal (GBE-C11-only)	Video on IP, LAN Extension	All Functions[2]	Enabled	Enabled	Disabled	Disabled
Access Link (GBE-C11-only)	LAN Extension	LAN	N/A	N/A	N/A	N/A

Note 1: The VC function is configured using the function command (cfg slot.s/ip/vc.m function).

Note 2: LAN Extension (VC function "lan" or "lan-ts") is supported only with a non-zero vlid.

Intro/Update: 5.6/6.5.0

cfg slot.s/ip/ifc.m **mpegttl**

Value(s): 1 to 255

Description: Specifies the time-to-live (TTL) value for IP packets carrying MPEG transport stream. Each node through which a packet passes, decrements the packet's time-to-live value. When the TTL value reaches zero (without reaching the desired destination), the packet is discarded.

Note: This setting is applicable to IP VCs whose function (cfg slot.s/ip/vc.m function) is set to one of the MPEG options.

Intro/Update: 5.2.0/5.2.0

cfg slot.s/ip/ifc.m **netdeg**

Value(s): enable, disable

Description: Enables or disables network degrade alarm reporting.

Note: Use the cfg sys/alm netDegSev command to set the severity level for this alarm.

Intro/Update: 2.1.0/3.0.0

cfg slot.s/ip/ifc.m **netflt**

Value(s): enable, disable

Description: Enables or disables network fault alarm reporting.

Note: Use the cfg sys/alm netFltSev command to set this alarm's severity level.

Intro/Update: 2.1.0/3.0.0

cfg slot.s/ip/ifc.m **protnetflt**

Value(s): enable, disable

Description: Enables or disables the Network Fault alarm. The Network Fault alarm provides a mechanism to trigger a module failover.

enable Some configurations provide redundant connections between network nodes. If a connection is broken (such as a fiber being cut), the network should switch to the alternative connection. Enabling module protection on network fault alarms helps provide this facility.

disable Network fault alarms do not affect the module's operating status. Conditions that contribute to network fault alarms might affect virtual channels on the interface, possibly triggering service protection, but a main module continues operating in that role.

Note 1: To successfully complete the failover, the backup must be operating without network fault alarms of its own (in addition to the normal module constraints).

Note 2: Disabling network fault alarms on the interface (by disabling interface alarms or by configuring the system's network fault severity to "None") also disables protection.

Note 3: The "Network Fault" alarm must be asserted to initiate an automatic module failover.

Intro/Update: 6.6.0/6.6.0

cfg slot.s/ip/ifc.m **ripstate**

Value(s): enable, disable

Description: Enables or disables Routing Information Protocol (RIP) for this interface.

Note 1: The commands cfg sys/ip/eth ripstate and cfg slot.s/ip/ifc.m ripstate are functionally equivalent.

Note 2: The command cfg sys/ctl rip provides global control over RIP and operates in conjunction with cfg slot.s/ip/ifc.m ripstate and (separately) in conjunction with cfg sys/ip/lis.m ripstate.

Note 3: Not available on the GBE-C11.

Intro/Update: 4.0.0/5.2.0

cfg slot.s/ip/ifc.m **tag**

Value(s): Any text string up to 31 characters.

Description: Specifies a name for this IP interface.

Note: See Section 22.6, "Overview of NetVX™ Tags" on page 159.

Intro/Update: 2.1.0/3.0.0

cfg slot.s/ip/ifc.m **txarptim**

Value(s): 0, 1 to 300

Description: Specifies the interval at which transmitting channels will test for the presence of the receiver using an ARP request.

0 Do not test for receiver presence after starting transmit channel.

1-300 Interval in seconds between tests for receiver presence

Intro/Update: 8.60

cfg slot.s/ip/ifc.m **vidgate**

Value(s): IP Address

Description: Sets the IP address of the interface's video gateway. The GBE-C11 uses the gateway address, specified by this setting, to route video onto other subnets.

Note: Any changes are made to this parameter must be updated in conjunction with other IP-related parameters using the util ip update command.

Intro/Update: 5.7.0/5.7.0

23.1.30 SYS, GBE IP Routing Table Configuration Parameters

cfg slot.s/ip/rte.m

slot.s s = Slot number.
- 1–17 SYS-1700's range of slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

rte.m m = Index for the IP routing table entry number (1-63).
- 1 Represents the first row of the routing table and is reserved for the default routing destination 0.0.0.0. This address refers to the local system.
- 2-63 Represent the remaining rows in the routing table.

Use these configuration parameters to manage IP routing table entries which affect how the system routes signals destined for other NetVX™ system on the same IP network.

Table 23-13 IP Routing Table Example

rte.m	Tag	DestAddr	DestMask	HopAddr	RowState
1	Default Gateway	0.0.0.0	0.0.0.0	–	Active
2	Chicago Video Subnet	125.12.6.83	255.255.255.0	125.12.6.1	Active
3	NY Video Subnet	125.12.18.9	255.255.255.0	125.12.18.1	Active
4	Tampa Video Subnet	125.12.23.5	255.255.255.0	125.12.23.1	Active

cfg slot.s/ip/rte.m **destaddr**

Value(s): IP Address
Description: Specifies an IP destination address for this IP routing table entry.
Intro/Update: 2.1.0/3.0.0

cfg slot.s/ip/rte.m **destmask**

Value(s): IP Address
Description: Specifies the subnet mask for the destination host or subnet.
Intro/Update: 2.1.0/3.0.0

cfg slot.s/ip/rte.m **hopaddr**

Value(s): IP Address
Description: Specifies the IP address of the next system or subnet to which the packet is sent while en route to the destination address. Set this value to 0.0.0.0 to forward packets to the interface's default router.
Intro/Update: 2.1.0/3.0.0

cfg slot.s/ip/rte.m **rowstate**

Value(s): active, create, destroy, inactive
Description: Sets the row state for the specified row in the IP routing table.
active Enables the specified row in the IP routing table for service.
create Creates a new entry in the IP routing table.
destroy Eliminates the specified row from the IP routing table.
inactive The specified row in the IP routing table is allocated but not active.
Intro/Update: 2.1.0/3.0.0

cfg slot.s/ip/rte.m **tag**

Value(s): Any text string up to 31 characters.

Description: Specifies a name to this IP routing table entry.

Note: See Section 22.6, "Overview of NetVX™ Tags" on page 159.

Intro/Update: 2.1.0/3.0.0

23.1.31 SYS, GBE IP Virtual Channel Auxiliary Table Configuration Parameters

cfg slot.s/ip/vc_aux.m

slot.s s = Slot number.
- 1–17 SYS-1700's range of slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

aux.m m = Index for the IP routing table entry number (0–255).

Use these configuration parameters to manage IP routing table entries which affect how the system routes signals destined for other NetVX™ system on the same IP network.

cfg slot.s/ip/vc_aux.m **mcastsrc**

Value(s): 0.0.0.0, <ip address>

Description: Specifies the multicast source address for one or more multicast groups. 'Upstream' routers can use this value in their interactions with other routers to establish an optimized path.

0.0.0.0 Configuring a zero IP address (0.0.0.0) specifies no particular source, thus requesting packets from a known group (but unknown sender). If the routers in the network do not support IGMP version 3, they will not filter the packets according to the source address; the client might still receive packets from other originators.

<ip address> When joining a multicast group IGMP version 3 allows one to specify the desired source address. Assuming cooperation from its router, a channel specifies both the multicast group (the channel's IP address) and also the desired originator of that group.

No central authority yet assigns multicast group addresses, so it is possible for multiple uncoordinated servers to transmit packets for the same multicast group. Before IGMP version 3, one could receive packets from an unintended multicast group (or even conflicting packets from multiple groups). Using IGMP version 3, a multicast group client can indicate to routers the specific group it wants to join, thus letting the routers deflect packets from the client that originate from other groups.

Example:

```
/cfg/slot.7/ip/vc_aux.2
   mcastSrc = nnn.nnn.nnn.nnn
    vcIndex = 1
```

This example shows a sinlge entry 'vc_aux.2' The 'vcIndex' indicates that this entry is associated with slot 7's first VC:

```
/cfg/slot.7/ip/vc.1
```

Note 1: This parameter does not function as a filter operating on incoming data but rather, it provides information to 'upsteam' routers.

Note 2: This parameter resembles cfg slot.s/ip/vc.m mcastsrc which associates a single multicast source address with a single virtual channel. Unlike that parameter, however, this facility provides a way to associate multiple multicast source addresses with a single virtual channel and registering each of them all with network routers.

Intro/Update: 7.8.0/7.8.0

cfg slot.s/ip/vc_aux.m **vcindex**

Value(s): 1 to 255

Description: Specifies the index number of the VC with which the specified multicast source address (above) is associated.

Example:

```
/cfg/slot.7/ip/vc_aux.2:
   mcastSrc = nnn.nnn.nnn.nnn
    vcIndex = 1
```

This example shows a sinlge entry 'vc_aux.2' The 'vcIndex' indicates that this entry is associated with slot 7's first VC:

```
/cfg/slot.7/ip/vc.1
```

Intro/Update: 7.8.0/7.8.0

23.1.32 SYS, GBE IP Interface VLAN Table Configuration Parameters

cfg slot.s/ip/vlan.m

slot.s s = Slot number.

1–17 SYS-1700's range of slot numbers.

2–4 SYS-200/SYS-300's range of application module slot numbers.

vlan.m m = Index for the VLAN table entry number (1-64).

Use these configuration parameters to manage IP VLAN table entries which determine the VLANs over which the NetVX™ can transmit or receive Video on IP.

Note: These table entries are used only for those VLANs over which the NetVX™ will transmit or receive Video on IP.

cfg slot.s/ip/vlan.m **ipAddr**

Value(s): IP Address

Description: Sets the IP address for this interface on this VLAN.

Intro/Update: 8.5.1/8.5.1

cfg slot.s/ip/vlan.m **ipMask**

Value(s): IP Address

Description: Sets the IP subnet mask for this interface on this VLAN.

Intro/Update: 8.5.1/8.5.1

cfg slot.s/ip/vlan.m **mpegTtl**

Value(s): 1 to 255

Description: Specifies the time-to-live (TTL) value for IP packets carrying MPEG transport stream on this VLAN. Each node through which a packet passes, decrements the packet's time-to-live value. When the TTL value reaches zero (without reaching the desired destination), the packet is discarded.

Intro/Update: 8.5.1/8.5.1

cfg slot.s/ip/vlan.m **tag**

Value(s): Any text string up to 31 characters.
Description: Specifies a name for the IP interface on this VLAN.
Note: See Section 22.6, "Overview of NetVX™ Tags" on page 159.
Intro/Update: 8.5.1/8.5.1

cfg slot.s/ip/vlan.m **vidgate**

Value(s): IP Address
Description: Sets the IP address of the interface's video gateway on this VLAN. The GBE-C11 uses the gateway address specified by this setting to route video onto other subnets
Intro/Update: 8.5.1/8.5.1

cfg slot.s/ip/vlan.m **vlid**

Value(s): 0 to 4095
Description: Specifies this entry's VLAN identifier.
0 Indicates that the VLAN Table Entry is unused.
1 to 4094 Range of VLAN identifiers.
4095 This is a reserved value which should not be used as a VLAN identifier.
Intro/Update: 8.5.1/8.5.1

23.1.33 SYS, GBE IP Interface VC Configuration Parameters

cfg slot.s/ip/vc.m

slot.s s = Slot number.
1–17 SYS-1700's range of slot numbers.
2–4 SYS-200/SYS-300's range of application module slot numbers.

vc.m m = Virtual channel number. The range is 1–255 on the SYS-G10, and SYS-A12 modules.

vc.m m = Virtual channel number. The range is 1-127 on the GBE-C11 module.

These settings affect how this NetVX™ transmits and receives IP data.

cfg slot.s/ip/vc.m **fec**

Value(s): none, low, medium, high

Description: Specifies the mode of forward error correction (FEC) for this IP virtual channel. This value applies to IP channels transmitting MPEG transport stream data, generating RTP parity packets according to RFC 2733. This value should be set to "none" for MPEG receivers and VCs configured for other channel functions (see note below).

To enhance error recovery, parity packets can be computed on a repeating, conceptual grid overlaid on the data packets. This grid has period columns (L) and order rows (D), as described by Pro-MPEG Code of Practice #3, January 2003. Beginning with version g.a.a, the module complies with Release 2 of this code of practice.

With forward error correction enabled, the correction packets are sent to a different port from the transport stream packets. Moreover, the channel's transmit rate includes only the transport stream data; error correction overhead (and IP overhead) must be separately computed to determine the entire bandwidth for the video-on-IP stream.

In the MPEG data stream, each IP packet carries up to 7 transport stream packets (see cfg slot.s/ip/vc.m tsperip), possibly wrapped in additional protocols. Each FEC parity packet carries error correction data for those transport stream packets. That FEC payload rides in an ethernet frame with a 14-byte header, carrying an IP packet with a 20-byte IP header, an 8-byte UDP header, a 12-byte RTP header, and a 16-byte FEC header.

none Disables forward error correction for this virtual channel.

custom Use this option to manually specify custom FEC period and order values using the cfg slot.s/ip/vc.m fecperiod and cfg slot.s/ip/vc.m fecorder commands.

low This is equivalent to setting (fec, period, order) to (custom, 1, 16), generating 1 parity packet for every 16 data packets.

medium This is equivalent to setting (fec, period, order) to (custom, 5, 8), generating 5 parity packets for every 40 data packets.

high This is equivalent to setting (fec, period, order) to (custom, 20, 4), generating 20 parity packets for every 80 data packets.

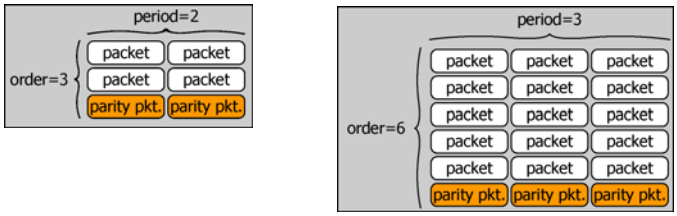


Figure 23-2 How FEC 'Period' and 'Order' Settings Affect Table Size

Table 23-14 How FEC Settings Control "Period" and "Order"

FEC Setting cfg slot.s/ip/vc.m fec on page 252	Period Setting(s) cfg slot.s/ip/vc.m fecperiod on page 253	Order Setting(s) cfg slot.s/ip/vc.m fecorder on page 253	Quantity of Data Packets
None	Ignored	Ignored	—
Custom	1–20 (See Note 1 below)	4–20 (See Note 1 below)	Multiple of the two settings used.
Low	1	16	16
Medium	5	8	40
High	20	4	80

Note 1: When using the 'Custom' setting, the product of the "Period * Order" may not exceed 100.

Note 2: This parameter is applicable only to IP VCs whose function (cfg slot.s/ip/vc.m function) is set to 'mpeg-rtp-tx'.

Note 3: This parameter is only provided by the GBE-C11.

Intro/Update:4.0.0/6.5.1

cfg slot.s/ip/vc.m **fecorder**

Value(s): 4 to 20

Description: Specifies the FEC order for this virtual channel. The “order” corresponds to the depth of the conceptual grid used for forward error correction.

Note 1: This setting is applicable only to IP VCs whose function (cfg slot.s/ip/vc.m function) is set to “mpeg-rtp-tx”.

Note 2: This parameter is only provided by the GBE-C11.

Intro/Update:5.2.0/5.6.0

cfg slot.s/ip/vc.m **fecperiod**

Value(s): 1 to 20

Description: Specifies the FEC order for this virtual channel. The “period” corresponds to the width of the conceptual grid used for forward error correction.

Note 1: This setting is applicable only to IP VCs whose function (cfg slot.s/ip/vc.m function) is set to “mpeg-rtp-tx“.

Note 2: This parameter is only provided by the GBE-C11.

Intro/Update:5.2.0/5.6.0

cfg slot.s/ip/vc.m **function**

Value(s): ipoa, lan, lan-ts, mpeg-rtp-rx, mpeg-rtp-tx, mpeg-ts-rx, mpeg-ts-tx,

Description: Specifies the function of this IPVC.

ipoa Use this setting for VCs carrying IP on ATM (IPoA) traffic. A VC with this setting may serve as either a cross connection source or a destination. This VC should only be connected to another IPOA VC.

lan Use this setting for VCs carrying generic LAN traffic. VCs operating in this mode perform layer 2 (Link Layer) packet processing only, and are bidirectional. When used in a cross-connect entry, a channel with this function should be paired with another channel that carries LAN traffic (such as an ATM LAN-VC channel).

lan-ts Use this setting for VCs carrying LAN traffic. VCs operating in this mode perform layer 2 (Link Layer) packet processing only, and are bidirectional. Packets sent over the backplane are encapsulated in a valid MPEG transport stream with a PMT and a PAT. When used in a cross-connect entry, a channel with this function should be paired with another channel that carries transport stream (such as a mux channel with function program).

mpeg-rtp-rx Use this setting for VCs that receive RTP-encapsulated (see note below) MPEG traffic from an interface connected to external equipment and serves as a cross connection source. This VC should be cross-connected to any destination that consumes MPEG transport stream data.

mpeg-rtp-tx Use this setting for VCs that provide RTP-encapsulated MPEG traffic to an interface connect to external equipment interface. Any NetVX™ source that creates MPEG transport stream data can be cross-connected to this VC.

mpeg-ts-rx This VC receives MPEG traffic from an interface connected to external equipment and serves as a cross connection source. This VC should be cross-connected to any destination that consumes MPEG transport stream data.

mpeg-ts-tx This VC serves as a cross connection destination and provides MPEG traffic to an external equipment interface. Any NetVX™NetVX™ source that creates MPEG transport stream data can be cross-connected to this VC.

mph-rtp-rx This VC receives IP/RTP traffic from the network, encapsulates the data in transport stream packets, and forwards the traffic across the backplane. One or more M/H services specify the sources of incoming data. M/H services use their VC index to reference specific IP virtual VCs, and their IP address and port specify the sources for the VC's incoming M/H data.

These streams are aggregated and encapsulated into TS packets. The VC's own IP address and port specify the source of signaling data (M/H tables, etc.) These data are also encapsulated into TS packets and sent across the backplane. As a receiver, this VC may serve as the source of a cross-connect entry; the VC should be connected to another VC that consumes MPEG transport stream data.

mph-rtp-tx This VC transmits M/H transport stream traffic encapsulated in RTP streams according to RFC's 3640 and 3984. The VC consumes MPEG transport stream data (with H.264 video and AAC-HEv2 audio) from the backplane, adds RTP/RTCP headers, and supplies the RTP/RTCP packets to its interface for transmission. As a transmitter, it may serve as the destination of a cross-connect entry; the VC should be connected to another VC that produces MPEG transport stream data. The VC's IP address and port specify the destination of the IP data. The number of ports used depends on the number of components in the M/H transport stream. Each incoming component (audio, video, data, ...) uses two ports, allocated consecutively starting from the specified port number.

Note 1: When a lan or lan-ts VC exists on a VLAN, there must be no other VC on that VLAN, and there must be no VLAN table entry for that VLAN.

Note 2: For a lan or lan-ts VC to have a vlid of zero, the interface must be in access-link mode.

Note 3: See also cfg slot.s/ip/vc.m ipaddr .

Note 4: Real Time Protocol (RTP) is handled according to IETF RFC 2250. RTP supports the correction of out of order packets and optionally, forward error correction.

Intro/Update: 2.1.0/7.8.0

cfg slot.s/ip/vc.m **ipaddr**

Value(s): 0.0.0.0, IP Address

Description: Specifies the source or destination IP address for this virtual channel. The system's behavior for this setting varies according to the setting of the VC's "function" (cfg slot.s/ip/vc.m function). The options for each **VC Function** setting are described below.

VC Function* Set to *IPOA

0.0.0.0 Inverse ATM ARP is used to determine the IP address of the remote device. The NetVX™ queries the VC with an ARP request, asking the neighboring network element to send its IP address. If the neighboring system responds to the inverse ATM ARP request, the resulting IP address is added to the inverse ATM ARP table.

#.#.#.# Inverse ATM ARP is disabled on this VC, and the specified destination address is used. The address specified must be unique amongst all VCs on the interface or else unexpected results will occur. In most cases, inverse ATM ARP is used and this manual step is not necessary. This option is provided as a workaround for remote equipment that does not properly respond to inverse ATM ARP requests.

VC Function Set to *LAN*

None The IP address is ignored

VC Function* Set to *MPEG-RTP-TX* or *MPEG-TS-TX

0.0.0.0 Indicates no destination has been configured.

#.#.#.# The IP address specifies the destination for the MPEG stream. The combination of the IP address and the UDP port number specified in cfg slot.s/ip/vc.m port must be unique amongst all VCs on the intended receiver or else unexpected results will occur. Either a unicast address or a multicast address may be specified.

VC Function* Set to *MPEG-RTP-RX* or *MPEG-TS-RX

The VC's IP address and port filter packets for normal IP routing or special video-on-IP handling.

0.0.0.0 The VC will receive packets unicast to the interface's IP address, and having the UDP port number specified in cfg slot.s/ip/vc.m port.

#.#.#.# The VC will receive packets sent to the specified multicast address, and having the UDP port number specified in cfg slot.s/ip/vc.m port. If the specified address is not a multicast address, it will be ignored, and the VC will operate as if the IP address were **0.0.0.0**.

Note 1: See also cfg slot.s/ip/vc.m function and cfg slot.s/ip/vc.m port .

Intro/Update: 4.0.0/5.6.0

cfg slot.s/ip/vc.m **mcastsrc**

Value(s): <IP Multicast Address>

Specifies the source IP address for a multicast group. When joining a multicast group, IGMP version 3 allows one to specify the desired source address. Assuming cooperation from its router, a channel specified both the multicast group (the channel's ipAddr parameter) and also the desired sender.

No central authority yet assigns multicast group addresses, so it is possible for multiple uncoordinated senders to transmit packets for the same multicast group. Before IGMP version 3, one could receive packets from an unintended sender, or even conflicting packets from multiple senders. Using IGMP version 3, a multicast receiver can tell the routers which specific group it wants to join, thus letting them filter out packets from other senders. However, the GBE-C11 does not filter received packets by source address, so if two streams arrive with the same multicast group address but from different sources, the GBE module will not be able to separate them.

Configuring a source IP address of zero (0.0.0.0) indicates no particular source, thus requesting packets from a known multicast group but from an unknown sender. If there are multiple senders in that group, the streams will conflict, and the result will not be a valid MPEG transport stream.

Note: This parameter is only applicable to non-system controller-based VCs.

Intro/Update: 6.6.0/6.6.0

cfg slot.s/ip/vc.m **mpegproc**

Value(s): cbr, vbr

Description: Specifies the MPEG processing for this virtual channel. This value applies to IP channels transmitting MPEG transport stream data and generating RTP parity packets according to RFC 2733. MPEG receivers and other channel functions ignore the value.

cbr This denotes constant bitrate transport stream. On output, the NetVX™ inserts null transport stream packets to bring the channel's transmit rate up to the required value.

vbr This denotes variable bitrate transport stream. On output, the NetVX™ reads packets out of their buffer at the highest rate possible, without exceeding the configured output rate. No null packets are inserted.

Note 1: The SYS-G10 and SYS-G10 modules only apply this processing to the transmit side.

Note 2: The GBE-C11 applies this processing to both the transmit and receive channels.

Intro/Update: 4.0.0/5.2.0

cfg slot.s/ip/vc.m **port**

Value(s): 0, 1024 to 66535 for transmit ports.
0 to 65535 for receive ports

Description: Specifies the UDP port for this channel. When a channel is configured to transmit MPEG (using cfg slot.s/ip/vc.m function), the IP address and port together specify where the MPEG stream is be sent. A receive channel also uses the port value, limiting its processing to only packets arriving on the specified port.

0 No port is configured and the port value is ignored.

1 to 65535 Specifies the port number to use.

Note 1: Forward Error Correction (FEC) requires it's own port in addition to the port specified by this command. When an IP VC is configured to use a one of the RTP functions, which use FEC, the system uses the port at the specified port number + 2 for FEC data; so FEC port = (port + 2)

Note 2: The Internet Assigned Numbers Authority (IANA) reserves ports 0 through1023 as well-known ports. To avoid conflicting with IANA services, transmit channels should use port numbers above 1023.

Intro/Update: 4.0.0/5.2.0

cfg slot.s/ip/vc.m **priority**

Value(s): 0 to 7

Description: Specifies the 802.1p priority when the channel is configured to transmit data. Also known as Class of Service.

Intro/Update: 8.5.1/8.5.1

cfg slot.s/ip/vc.m **rowstate**

Value(s): active, create, destroy, inactive

Description: Sets the row state for the specified row in the IP virtual channel table.

active Enables the specified row in the IP virtual channel table.

create Creates a new entry in the IP virtual channel table.

destroy Eliminates the specified row from the IP virtual channel table.

inactive The specified row in the IP virtual channel table is allocated but not active.

Intro/Update: 2.1.0/3.0.0

cfg slot.s/ip/vc.m **rxnulldis**

Value(s): enable, disable

Description: Enables or disables the internal function for discarding of null packets from the received MPEG stream.

Intro/Update: 5.2.0/5.2.0

cfg slot.s/ip/vc.m **rxrate**

Value(s): 0, 0.01 to 310.00 Mbps

Description: Specifies the gross input policing bitrate. This rate is all-inclusive (includes both payload and overhead. Data are dropped if the rate is exceed. Use “0” to disable policing.

Note 1: The VC upper bandwidth ingress limit is governed by module’s overall ingress limit. This limit is specified in Table 26-2, "Module Ingress and Egress Bandwidth" on page 456.

Intro/Update: 5.2.0/7.0.0

cfg slot.s/ip/vc.m **tag**

Value(s): Any text string up to 31 characters.

Description: Specifies a name for this IP virtual channel.

Note: See Section 22.6, "Overview of NetVX™ Tags" on page 159.

Intro/Update: 2.1.0/3.0.0

cfg slot.s/ip/vc.m **txtos**

Value(s): 0x00 to 0xff

Description: Specifies the Type of Service (TOS) field entry in transmit IP packet headers.

Note 1: Currently, these service bits have vendor-specific meanings. One might configure the value, depending on the equipment receiving the data.

Note 2: This command applies only to the GBE-C11.

Intro/Update: 5.2.0/5.6.1

cfg slot.s/ip/vc.m **tsperip**

Value(s): 1 to 7 (7 is the default)

Description: Specifies the transport stream packet count per IP transmission unit. When a channel is configured to transmit MPEG, this value tells how many 188-byte transport stream packets to group into each IP packet. The default value, 7, constructs IP packets with (7 * 188) = 1316 bytes of payload. Generally, this helps lower the overhead, without fragmenting packets on typical ethernet devices using 1500-byte frames.

Note: This parameter is provided to support Pro-MPEG Code of Practice #3, January 2003.

Intro/Update: 5.2.0/5.6.0

cfg slot.s/ip/vc.m **txrate**

Value(s): 0, 0.01 to 310.00 Mbps (GBE-C11 module)
0, 0.01 to 20.00 Mbps (SYS-G10 and SYS-A12 modules)

Description: Specifies the VC's transmit payload bit rate.
While the Payload TX Rate specified here adds to the stream's overall bit rate, the VC's "Function" setting (cfg slot.s/ip/vc.m function) also affects the calculation.

mpeg-rtp-tx, When RTP is used, the overhead for forward error correction is figured into the overall VC bit rate. This approach results in a bit stream that is larger than one that does not use RTP (below).

mpeg-ts-tx The payload rate is the transport stream bit rate.

Intro/Update: 4.0.0/5.6.1

cfg slot.s/ip/vc.m **vcdeg**

Value(s): enable, disables

Description: Enables or disables degrade alarm reporting for this IPVC.

Note: Use the cfg sys/alm vcDegSev command to set this alarm's severity level.

Intro/Update: 2.1.0/3.0.0

cfg slot.s/ip/vc.m **vcflt**

Value(s): enable, disable

Description: Enables or disables fault alarms for this VC.

Note: Use the cfg sys/alm vcFaultSev command to set this alarm's severity level.

Intro/Update: 6.5.0/6.5.0

cfg slot.s/ip/vc.m **vlid**

Value(s): -1 to 4095

Description: Specifies this virtual channel's VLAN identifier.

-1 Indicates untagged LAN frames. The use of this value is obsolete, use 0 instead.

0 Indicates untagged LAN frames. A tag header may be used if the VC's priority (Class of Service) is non-zero.

1 to 4094 Range of VLAN identifiers.

4095 This is a reserved value which should not be used as a VLAN identifier.

Note: If a non-zero value is used on an MPEG VC (function mpeg-rtp-rx, mpeg-rtp-tx, mpeg-ts-rx, or mpeg-ts-tx), then there must be a VLAN table entry for the VLAN.

Intro/Update: 5.6.0/8.5.1

23.1.34 TMX Demux Configuration Parameters

cfg slot.s/mux/dxifc.m

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dxifc.m m = Demux interface (dxifc) number (1-8). Specifies any one of the TMX module's eight internal demultiplexer (dx) interfaces

cfg slot.s/mux/dxifc.m **netdeg**

Value(s): enable, disable
Description: Enables/disables the interface's network degrade alarms.
Note: Use the cfg sys/alm netDegSev command to set this alarm's severity level.
Intro/Update: 3.1.0/4/0.0

cfg slot.s/mux/dxifc.m **netflt**

Value(s): enable, disable
Description: Enables/disables the interface's network fault alarms.
Note: Use the cfg sys/alm netFltSev command to set this alarm's severity level.
Intro/Update: 3.1.0/4/0.0

cfg slot.s/mux/dxifc.m **simode**

Value(s): dvb, mpeg, atsc
Description: Specifies the system information table paradigm.
dvb Processes and preserves Digital Video Broadcasting (DVB) control tables. This setting forward the SDT on PID 17 through the demultiplexer.
mpeg Processes and preserves only generic MPEG control tables. This setting discards MPEG application-specific SDTs.
atsc Processes and preserves only generic ATSC control tables.
Intro/Update: 4.0.0/5.6.0

cfg slot.s/mux/dxifc.m **tag**

Value(s): Any text string up to 31 characters.
Description: Specifies a name for this demux interface.
Intro/Update: 3.1.0/4/0.0

23.1.35 TMX Demux VC Configuration Parameters

cfg slot.s/mux/dxvc.m

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dxvc.m m = Demux Virtual Channel (Demux VC) number (1-63).

cfg slot.s/mux/dxvc.m **audfilter**

Value(s): 80:00:00:00 to ff:ff:ff:ff (4-byte octet string, represented externally as 4 hexadecimal octets: aa:bb:cc:dd)

Description: Specifies a filter mask for dropping audio program elements on this VC. In the mask, each bit represents one audio element in the Program Map Table (PMT). Bits values have the following meaning.

Bit Value = 1 The corresponding audio element is preserved (if it exists).

Bit Value = 0 The corresponding audio element is dropped. The mask can "preserve" non-existent elements without causing an error.

Ex. (1):

ff:ff:ff:ff As a special case, a mask of all ones (ff:ff:ff:ff) preserves all audio elements, even when the program contains more than 32 elements. Other masks will cause elements 33 and above to be dropped.

When the VC drops an element, it deletes that element's entry in the PMT, including associated descriptors. To the extent possible, the VC also drops additional system information associated with the service. For example, ATSC programs might include A/65 PSIP, and the VC will delete service location descriptors for dropped audio services.

Actual resulting mask: 11111111111111111111111111111111

Ex. (2):

80:00:00:00 This value specifies a mask that preserves only the first audio element in the PMT; other audio elements are dropped.

Actual resulting bit mask: 10000000000000000000000000000000

Ex. (3):

40:00:00:00 This value specifies a mask that preserves only the second audio element in the PMT; other audio elements are dropped.

Actual resulting bit mask: 01000000000000000000000000000000

Ex. (4):

00:00:00:01 This value specifies a mask that preserves only the thirty-second audio element in the PMT; other audio elements are dropped.

Actual resulting bit mask: 00000000000000000000000000000001

Note 1: This mechanism depends on the order of audio elements in the PMT. If that order changes, the audio filter mask would also need to change to track the new PMT order.

Note 2: Changes to the PMT can force the VC to re-scan the program structure. If the changes are extensive enough (new PID assignments, for example), the VC might momentarily interrupt its processing for the program.

Note 3: If a program uses an audio service to carry PCRs (program clock references), then care must be taken not to drop that audio service. MPEG decoders need the PCRs to correctly decode the stream. (Many programs put PCRs in the video stream, which cannot be dropped by this mechanism.)

The demultiplexer VC ignores this parameter in the following cases:

Note 4: This parameter is ignored when this VC is an internal multiplexer sending its MPTS output through this VC.

Note 5: This parameter is ignored when this VC's interface is an external receiver with pass through enabled.

Note 6: This parameter is ignored when this VC's function is not either "Program" or "Transrate" meaning the channel is not extracting a program from the transport stream.

Intro/Update: 6.6.0/6.6.0

cfg slot.s/mux/dxvc.m **datafilter**

Value(s): 80:00:00:00 to ff:ff:ff:ff (4-byte octet string, represented externally as 4 hexadecimal octets: aa:bb:cc:dd)

Description: Specifies a filter mask for dropping data program elements on this VC. In the mask, each bit represents one data element in the Program Map Table (PMT). Bits values have the following meaning.

Bit Value = 1 The corresponding data element is preserved (if it exists).

Bit Value = 0 The corresponding data element is dropped. The mask can "preserve" non-existent elements without causing an error.

Ex. (1):

ff:ff:ff:ff As a special case, a mask of all ones (ff:ff:ff:ff) preserves all data elements, even when the program contains more than 32 elements. Other masks will cause elements 33 and above to be dropped.

When the VC drops an element, it deletes that element's entry in the PMT, including associated descriptors. To the extent possible, the VC also drops additional system information associated with the service. For example, ATSC programs might include A/65 PSIP, and the VC will delete service location descriptors for dropped data services.

Actual resulting mask: 11111111111111111111111111111111

Ex. (2):

80:00:00:00 This value specifies a mask that preserves only the first data element in the PMT; other data elements are dropped.

Actual resulting bit mask: 10000000000000000000000000000000

Ex. (3):

40:00:00:00 This value specifies a mask that preserves only the second data element in the PMT; other data elements are dropped.

Actual resulting bit mask: 01000000000000000000000000000000

Ex. (4):

00:00:00:01 This value specifies a mask that preserves only the thirty-second data element in the PMT; other data elements are dropped.

Actual resulting bit mask: 00000000000000000000000000000001

Note 1: This mechanism depends on the order of data elements in the PMT. If that order changes, the data filter mask would also need to change to track the new PMT order.

Note 2: Changes to the PMT can force the VC to re-scan the program structure. If the changes are extensive enough (new PID assignments, for example), the VC might momentarily interrupt its processing for the program.

Note 3: If a program uses an data service to carry PCRs (program clock references), then care must be taken not to drop that data service. MPEG decoders need the PCRs to correctly decode the stream. (Many programs put PCRs in the video stream, which cannot be dropped by this mechanism.)

The demultiplexer VC ignores this parameter in the following cases:

Note 4: This parameter is ignored when this VC is an internal multiplexer sending its MPTS output through this VC.

Note 5: This parameter is ignored when this VC's interface is an external receiver with pass through enabled.

Note 6: This parameter is ignored when this VC's function is not either "Program" or "Transrate" meaning the channel is not extracting a program from the transport stream.

Intro/Update: 6.6.0/6.6.0

cfg slot.s/mux/dxvc.m **dropca**

Value(s): enable, disable

Description: Enables/disables the disposal of Conditional Access (CA) data.

enable Directs the VC to discard all CA information. Specifically, the Entitlement Control Message (ECM) stream, and any CA descriptors, referenced through the PMT.

disable (default) Allows the VC to pass CA information intact.

Note 1: This parameter is ignored when the VC is on an internal interface.

Note 2: This parameter is ignored when the interface is operating in passthrough mode.

Note 3: This parameter is ignored when the VC's "Function" is set to "CA", thereby designating it to carry Conditional Access information.

Intro/Update: 6.0.0/6.0.0

cfg slot.s/mux/dxvc.m **function**

Value(s): ca, opportunistic-data, pid, program, transrate

Description: Specifies the payload type for this virtual channel.

ca Indicates that this VC carries conditional access information. Many transport streams carry conditional access data, supporting encryption services to protect a stream's contents. When a VC's function is set to this value, all conditional access PIDs, referenced in the conditional access table, are collected and sent through the VC. A demultiplexer interface may have no more than one conditional access VC.

opportunistic-data his function participates in supplying opportunistic data for an external transmit interface. In this application, a single multiplex channel has its function set to 'opportunistic-data'. That VC supplies data to be used instead of null packets for bringing the transport stream up to a given rate. A single demultiplex channel can be specified to carry flow control messages, following SMPTE 325M-1999, Opportunistic Data Broadcast Flow Control. This demultiplex channel carries transport stream and should be connected to the opportunistic data server.

pid Packets are extracted from the transport stream according to PID number and are carried on this VC. The PID number is specified using the PID parameter (cfg slot.s/mux/dxvc.m pid***).***
The following principles apply to this setting selection.
(1) When a PID is configured for individual extraction, its packets must not be routed through any other VC on the interface.
(2) No other VC should reference the PID for extraction from the multiplex, either explicitly or implicitly, otherwise a VC Degrade - Configuration Error alarm (VC Degrade - Configuration Error) is raised.
(3) This function supports "unusual" applications and might require application engineering support to configure correctly. The VC carrying this single PID may be connected like a normal demultiplexer VC. Some destinations, such as decoders, are unlikely to process it successfully, but the system does not prevent the connections. The most useful destination is likely to be a multiplexer VC, whose function is set to insert a specific PID into a multiplex.

program A program is extracted from the transport stream according to its program number (in the PAT) and is carried on this VC. The target PAT program number is specified using the cfg slot.s/mux/dxvc.m prognum command. Based on the VC's program number, the module uses the transport stream's PAT to find the program's PMT, collects the referenced PIDs, and sends those PIDs' packets through the VC.

transrate This function extends "program". In addition to the program behavior, this function can recode a program's video to adjust the total bandwidth. Transrating will not increase the bandwidth (the stream does not contain enough information to improve the picture quality by raising the rate).

Note 1: The VC's function setting is ignored under the following conditions.
(a) The VC's interface is an internal multiplexer sending its MPTS output through this VC.
(b) The VC's interface is an external receiver with pass through enabled.

Note 2: Some function values consume limited internal resources. If any constraints are violated, the module will declare an alarm (Module Degrade - Configuration Error).

Intro/Update: 5.7.0/5.8.0

cfg slot.s/mux/dxvc.m **ifc**

Value(s): dx-1 through dx-8, mx-1 through mx-8, rx-1, rx-2

Description: Specifies the interface *from which* this Demux VC receives its signal.

Intro/Update: 3.1.0/4/0.0

cfg slot.s/mux/dxvc.m **pid**

Value(s): -1, 1 to 8190

Description: Specifies the packet identifier (PID) associated with this VC.

When the channel's function (cfg slot.s/mux/dxvc.m function) is set “pid”, the packet identifier specifies which packets to extract from the interface's transport stream. Other VC functions ignore this setting.

-1 (Default) A PID of this value cannot occur in a transport stream. If the channel is configured for single-PID processing, this gives a “safe” default value that cannot match any packets (and thus avoids duplicating a PID in an active program). Additionally, channels configured for other functions use -1 to indicate the absence of specific PID extraction.

0 Warning: Do not use this value. Using this value causes the TMX module to extract the stream’s program allocation table (PAT) and disables program processing.

1 to 8190 Packets from the specified input PID are remapped to PID 42 before transferring them through the VC. When processing a full program from a multiplex, the system remaps the program number to 1 and all the PIDs starting at 32. For a full program, PID 42 corresponds to the first assigned data PID within the program. Because a single-PID channel normally would carry data, we remap the designated input PID to 42. For symmetry, a multiplexer VC (cfg slot.s/mux/mxvc.m) that inserts a single PID also uses packets from PID 42.

Intro/Update: 5.7.0/5.7.0

cfg slot.s/mux/dxvc.m **prognum**

Value(s): 1 to 65535

Description: Specifies the program number associated with this demux VC entry.

Intro/Update: 3.1.0/4/0.0

cfg slot.s/mux/dxvc.m **rate**

Value(s): 0 to 214 Mbps

Description: Specifies the policing behavior for this VC.

VC’s with the function “ca”, “pid”, or “program” discard packets that cause the stream to exceed this rate. VC’s with the function “transrate” use the specified rate as the upper bound of stream.

0 Data is allowed up to the maximum rate permitted by the interface.

1 to 214 Data is policed at the rate specified.

Intro/Update: 3.1.0/5.8.0

cfg slot.s/mux/dxvc.m **rowstate**

Value(s): active, create, destroy, inactive

Description: Specifies this row's state.

*active ** The entry is allocated and enabled for service. As described above, the system checks various rules before activating an entry.

create To create a new entry in the table, a manager selects an index (more on this below) and tries to set that row's state to create. If the index is valid and that row is not allocated in the table, the system creates a new row at the specified index. Otherwise the SET operation fails. After creating a new row in the table, the system sets its state to inactive.

destroy Setting a row's state to this value eliminates the row from the table. Any row can be destroyed, regardless of its current state or whether it actually exists.

inactive The entry is allocated but not currently carrying a service.

Note: * Availability of this selection is determined by the module’s feature profile.

Intro/Update: 3.1.0/4/0.0

cfg slot.s/mux/dxvc.m **tag**

Value(s): Any text string up to 31 characters.
Description: Specifies a name for this demux VC.
Intro/Update: 3.1.0/3.1.0

cfg slot.s/mux/dxvc.m **vcdeg**

Value(s): enable, disable
Description: Enables/disables this row's VC degrade alarms.
Intro/Update: 3.1.0/3.1.0

cfg slot.s/mux/dxvc.m **vcflt**

Value(s): enable, disable
Description: Enables or disables fault alarms for this VC.
Note: Use the cfg sys/alm vcFaultSev command to set this alarm's severity level.
Intro/Update: 6.5.0/6.5.0

23.1.36 TMX Mux Configuration Parameters

cfg slot.s/mux/mxifc.m

slot.s s = Slot number.

3–17 SYS-1700's range of application module slot numbers.

2–4 SYS-200/SYS-300's range of application module slot numbers.

mxifc.m m = Mux interface (mxifc) number (1-8). Specifies any one of the TMX module's eight internal multiplexer (mx) interfaces.

cfg slot.s/mux/mxifc.m **basedpid**

Value(s): -1048512 to 4080; Full Range is -4294967296 to 4294967296 (32-bit signed integer)

Description: Specifies the base PID for 'Program 1' on this interface. When the interface's PID map operates in 'Automatic Mode', this base value helps compute the first PID for a channel's program. Other PID mapping conventions ignore this base PID value.

MPEG defines a packet identifier as a 13-bit number, reserving 0 through 15 and 8191 (0x1FFF). The ATSC standard further reserves PIDs below 48 (see ATSC A/53, Revision E with Amendments 1 and 2, Annex C Section 5.7.4). This parameter's default value, 48, associates program 1 with the first available PID for ATSC.

Although actual PIDs are non-negative, this base PID value can be configured with a negative value. For example, suppose a DVB application wanted to construct a multi-program transport stream with program numbers starting at 100 and PIDs starting at 32. Using the computation for automatic PID mapping:

```
program_base_PID = interface_base_pid + 16 * (program_number - 1)
32 = interface_base_pid + 16 * 99
interface_base_pid = -1552
```

Consequently, setting this base PID value to -1552 would be appropriate for the hypothetical application.

If this example used ATSC System Information tables (PSI Mode), program 100 would still correspond to PID 32, but the dynamic assignments would differ. The system reserves PIDs below 48 in ATSC mode, so it would assign another PID block to program 100 (from the secondary allocation pool). Program 101 would receive its primary PID block, starting at the computed base of 48.

Intro/Update: 7.0.0/7.0.0

cfg slot.s/mux/mxifc.m **carrierfreq**

Value(s): 0.000000 to 4294.967295 MHz

Description: Specifies the ATSC carrier frequency for this stream. For US terrestrial channels, the carrier frequencies depend on the modulation mode, which can be analog or digital. We currently assume digital modulation (8 VSB), giving the following frequency assignments.
Every channel occupies a 6 MHz band within its range, so the base frequencies for channels 2, 3, and 4 are 54 MHz, 60 MHz, and 66 MHz. ATSC digital channels use the base frequency plus 310 KHz.

Table 23-15 Channel Frequency Ranges and Nominal Frequency

Channel Range	Frequency Range (MHz)	Nominal Frequency (MHz)
2 to 4	54 to 72	(channel - 2) * 6 + 54 + 0.310
5 to 6	76 to 88	(channel - 5) * 6 + 76 + 0.310
7 to 13	174 to 216	(channel - 7) * 6 + 174 + 0.310
14 to 69	470 to 806	(channel - 14) * 6 + 470 + 0.310

Small adjustments are possible to reduce interference between stations that broadcast on the same channel (such as two stations in New York and Philadelphia). Consequently, the computed frequency should be adjustable.

Note 1: If the interface's system information mode is set for ATSC, this value is used for the carrier frequency (see the virtual channel table in ATSC A/65). Other SI modes ignore this value.

Note 2: A/65 associates a carrier frequency with each channel in the virtual channel table, but all channels in a transport stream are broadcast together, at the same carrier frequency. Consequently, this carrier frequency parameter is assigned to the interface (transport stream), not to an individual VC.

Note 3: Despite nomenclature that suggests otherwise, the channel used to compute the carrier frequency is unrelated to the major and minor channel numbers assigned to a component of the transport stream.

Intro/Update: 5.5.0/5.5.0

cfg slot.s/mux/mxifc.m **crslrate**

Value(s): 0 to 16,000,000 bps

Description: Specifies the data carousel bitrate for the interface. If the interface's carousel has streaming enabled, this bitrate governs the maximum transport stream bandwidth that will be used by carousel data.

Note: The quantity, and rate of other carousels on this interface may limit the maximum rate per carousel.

Intro/Update: 5.2.0/5.2.0

cfg slot.s/mux/mxifc.m **crslstream**

Value(s): enable, disable

Description: Enables/disables the interface's data carousel streaming.

enable Turns on carousel handling. If a valid carousel file is present, and its activation time has arrived, the file's data will be multiplexed into the interface's transport stream.

disable Turns off carousel streaming. Any existing carousel files are ignored, and the interface does not check for new carousel files. Carousel data are not multiplexed into the transport stream.

Intro/Update: 5.2.0/5.2.0

cfg slot.s/mux/mxifc.m **delivsysdesc**

Value(s): Read Only

Description: Specifies the DVB delivery system descriptor for this stream. This value provides information for a cable, satellite, or terrestrial delivery system; all three descriptors occupy 13 bytes. This value simply carries the information. An external entity, such as an element manager, is responsible for setting the descriptor appropriately. This value is active when the system information mode (cfg slot.s/mux/mxifc.m simode) is set for DVB. Other SI modes ignore this value. See DVB document A038 for further details.

Intro/Update: 5.5.0/5.5.0

cfg slot.s/mux/mxifc.m **dtpinterval**

Value(s): 25 to 10000 msec.

Description: Specifies the interval (in milliseconds) between distributed transmission packets. ATSC Document A/110B, Synchronization Standard for Distributed Transmission, Revision B (December 2007) describes the details for "single frequency networks" involving multiple transmitters. When this interface contributes to a single frequency network and the number of tiers is greater than zero, distributed transmission packets are emitted into the stream. This value gives the interval between such operations and maintenance packets (in milliseconds). This interval is ignored if the number of tiers is zero. See cfg slot.s/mux/mxifc.m dtpnumtiers (below) for details on that setting.

The operations and maintenance packets cycle through the network tiers, so a given tier will see one of these packets every numberOfTiers * interval milliseconds. The A/110B standard specifies a minimum interval of 24.2 msec., leading to this parameter's lower bound of 25 msec.

Intro/Update: 7.8.0/7.8.0

cfg slot.s/mux/mxifc.m **dtpnumtiers**

Value(s): 0 to 16

Description: Specifies the number of tiers for a distributed transmission network. ATSC Document A/110B, Synchronization Standard for Distributed Transmission, Revision B (December 2007) describes the details for "single frequency networks" involving multiple transmitters. When multiple copies of a signal are potentially available to a receiver, strict timing constraints are placed on the transmitters. Moreover, the stream carries Distributed Transmission Packets with operations and maintenance information.

This parameter specifies the number of tiers in the network (see A/110B for technical details). All such networks have at least one tier. A zero value indicates this transmit interface does not carry a distributed transmission signal, thus disabling transmission of the DTPs. Values from 1 to 16 give the number of tiers in the network, enabling emission of the DTPs at the configured interval. See cfg slot.s/mux/mxifc.m dtpinterval (above) for details on that setting.

Intro/Update: 7.8.0/7.8.0

cfg slot.s/mux/mxifc.m **emmbasepid**

Value(s): -1, 32–8191

Description: Sets the EMM Base PID value used with Conditional Access.

-1 This is the default value, it assigns the EMM Base PID to 8194.

32-8191 Range of possible EMM PID values.

Intro/Update: 8.1.1/8.1.1

cfg slot.s/mux/mxifc.m **netdeg**

Value(s): enable, disable

Description: Enables/disables the interface's network degrade alarms.

Note: Use the cfg sys/alm netDegSev command to set this alarm's severity level.

Intro/Update: 5.0.0/5.0.0

cfg slot.s/mux/mxifc.m **networkid**

Value(s): 0 to 65535

Description: Specifies the DVB network identifier for this stream. This 16-bit value identifies the network delivery system when the system information mode is set for DVB. Other SI modes ignore this value.

Note: See DVB A038 and ETSI ETR-162 for details.

Intro/Update: 5.2.0/5.5.0

cfg slot.s/mux/mxifc.m **pidmap**

Value(s): auto, manual

Description: Use this control to specify whether PIDs in programs on this interface should be mapped 'Automatically' or 'Manually'.

Automatic The interface uses its own Base Pid (See "cfg slot.s/mux/mxifc.m basedpid" on page 267) and the VC's program number to determine a Base PID value for the program. It then assigns a group of 16 PIDs to the program as described in Table 23-16 below.

The interface's Base PID (either 'cfg slot.s/mux/mxifc.m/basepid', or 'cfg slot.s/mux/txifc.m/basepid') gives the Base PID for program number one.

Note: In the case where the mutliplexer is creating an ISDB-Tb stream, the PMT PID is configured according to STANDARD SBTVD N08-3 section 25.4 (Partial reception layer PMT PID). Please refer to this standard for exact configuration details.

Primary PID Allocation Pool

PIDs from 32 through 4095 (0xFFF) form a primary allocation pool, used exclusively for programs whose program number maps PIDs in this range. Programs using the ATSC System Information mode avoid PIDS from 32 to 47; other SI modes use PIDs in the range.

Secondary PID Allocation Pool

PIDs in the range from 4096 (0x1000) through 7167 (0x1BFF) form a secondary allocation pool. Program numbers outside the primary range allocate 16-PID blocks from this pool as needed. Any program that needs more than 16 PIDs also receives PIDs from this secondary pool.

All PIDs from the secondary pool are allocated dynamically. This can cause PID assignments to change across system resets, module re-configuration, etc. Although each program's PMT would reflect such changes, some applications might have trouble dealing with the un-predictability of this approach. Those applications could use manual PID assignments as described below.

The default interface Base PID, 48, associates program number one with the 16-PID block from 48 through 63. Using this default value, programs 1 through 253 would use the primary allocation pool. Programs 254 through 65535 would allocate PIDs from the secondary pool.

As another example, configuring the interface Base PID to 0 changes the program-to-PID correspondence. PIDs from 0 to 31 are reserved, so programs 1 (Base PID 0) and 2 (Base PID 16) would allocate PIDs from the dynamic secondary pool. An ATSC program also would use the secondary pool for program 3 (Base PID 32), but other SI modes would allocate program 3 from the primary pool. Programs 4 (Base PID 48) through 256 (Base PID 4080) would use the primary pool (in all SI modes). Programs 257 through 65535 would use the secondary pool.

Table 23-16 Automatic PID Mapping Formula Example Based on ATSC Recommendation

PID Type	Formula	Example	PID #
Program Number	Block 1: Programs 1 to 253 Block 2: Programs 254 to 65,535 Interface Base PID + 16 * (program number - 1) = 96	4	–
PMT (Base) PID	Base PID + 0 See Note 1	96 + 0	96
Video PID	Base PID + 1	96 + 1	97
PCR PID	Base PID + 2	96 + 2	98
Audio 1 PID	Base PID + 3	96 + 3	99
Audio 2 PID	Base PID + 4	"1" is added for each subsequent Audio PID.	100
Data 1 PID	Base PID + 11	96 + 11	107
Data 2 PID	Base PID + 12	"1" is added for each subsequent Data PID.	108
ECM 1 PID	Base PID + 14	96 + 14	110
ECM 2PID	Base PID + 15	"1" is added for each subsequent ECM PID.	111

Manual In 'Manual' mode, each VC specifies its own PID values, using the configuration values in the VC's program group.

MPEG defines a packet identifier as a 13-bit number, reserving 0 through 15 and 8191 (0x1FFF).

The ATSC standard further reserves PIDs below 48. Moreover, the ATSC program guide (PSIP) tables conventionally use PIDs at 7680 (0x1E00) and above. The automatically assigned values avoid these ranges, and uses values from 32 to 7167 (0x1BFF).

Note: In 'Manual' mode, all PIDs for the interface must be unique. If a VC tries to use a PID that has already been assigned on the same interface, the VC will declare a 'VC Degrade – Configuration Error Alarm'.

Intro/Update:6.0.0/7.0.0

cfg slot.s/mux/mxifc.m **simode**

Description: Specifies the system information table paradigm.

atsc Generate control tables appropriate for ATSC broadcasters.

dvb Generate control tables for the Digital Video Broadcasting project.

mpeg Generate generic MPEG control tables.

none Generate no tables. To form a correct MPEG stream, the control tables would need to be inserted by other means.

Intro/Update:3.1.0/4/0.0

cfg slot.s/mux/mxifc.m **tag**

Value(s): Any text string up to 31 characters.

Description: Specifies a name for this mux interface.

Intro/Update:3.1.0/4/0.0

cfg slot.s/mux/mxifc.m **tsid**

Value(s): 0 to 65535

Description: Specifies the transport stream ID for this interface *.

Note: * Availability of this selection is determined by the module's feature profile. See Table 20-2, "TMX-M12 Module Type Definitions" on page 148. See also util key .

Intro/Update: 3.1.0/4/0.0

23.1.37 TMX Mux PMT Reference Table Configuration Parameters

cfg slot.s/mux/pmtref.m

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

pmtref m = PMT reference table entry number (1-63)

cfg slot.s/mux/pmtref.m **descriptors**

Value(s): A series of two-digit hexadecimal values separated by colons.
Description: Specifies the descriptors associated with the PID. The format of the descriptors is specified in ITU-T Rec. H.222.0, Section 2.6, Table 2-39.
Intro/Update: 8.6.0

cfg slot.s/mux/pmtref.m **ifc**

Value(s): tx-1, tx-2
Description: Specifies the interface carrying the program or programs to which the PID is to be added.
Intro/Update: 8.6.0

cfg slot.s/mux/pmtref.m **pid**

Value(s): 0 to 8190
Description: Specifies the PID to be added to the PMT.
Intro/Update: 8.6.0

cfg slot.s/mux/pmtref.m **prognum**

Value(s): 0, 1 to 65535
Description: Specifies the program number to which the PID is to be added.
0 The PID is added to every PMT generated by the interface.
1 to 65565 The PID is added only to the specified program on the interface.
Intro/Update: 8.6.0

cfg slot.s/mux/pmtref.m **rowstate**

Value(s): active, create, destroy, inactive
Description: Specifies this row's state.
Active The entry is allocated and enabled.
Create To create a new entry in the table, a manager selects an index and sets that row's state to create. If the index is valid and that row is not allocated in the table, the system creates a new row at the specified index. Otherwise the SET operation fails. After creating a new row in the table, the system sets its state to **inactive**.
Destroy Setting a row's state to this value eliminates the row from the table. Any row can be destroyed, regardless of its current state or whether it actually exists.
Inactive The entry is allocated but not currently enabled.
Intro/Update: 8.6.0

cfg slot.s/mux/pmtref.m **streamtype**

Value(s): 1 to 0xff

Description: Specifies the stream type for the PID. This 8-bit field specifies the type of the program element carried in the PID's transport stream packets. See the MPEG specification (ITU-T Rec H.222.0, Section 2.4.4.9, Table 2-29) for details on the stream type.

Intro/Update: 8.6.0

23.1.38 TMX Mux Configuration Parameters

cfg slot.s/mux/txifc.m/isdb

cfg slot.s/mux/txifc.m/isdb **AreaCode**

Value(s): 0 to 4095 characters
Description: Specifies the 12-bit area code, defined by the local country.
Intro/Update:7.3.0/7.3.0

cfg slot.s/mux/txifc.m/isdb **Country**

Value(s): 0 to 3 characters
Description: Specifies the country code for this interface's time zone. See ISO 3166 for the values to use.
Intro/Update:7.3.0/7.3.0

cfg slot.s/mux/txifc.m/isdb **DstDate**

Value(s): text as YYYY-MM-DD

Description: Specifies the date for the next time zone change. The parameters below contribute to time zone changes. The values help construct system information tables, such as the ISDTV Time Offset Table.

cfg slot.s/mux/txifc.m/isdb DstDate

The date on which a time zone change occurs, in YYYY-MM-DD format.

cfg slot.s/mux/txifc.m/isdb DstTime

This value gives the local time when a time zone change occurs, in hh:mm:ss format. Using local time is convenient for the operator and the system. An example transition out of DST occurred in the USA on October 26, 2003 at 2:00 AM (02:00:00).

cfg slot.s/mux/txifc.m/isdb LocalTimeOffset

This value gives a signed offset between UTC and the local time, in hh:mm format. A leading "-" indicates a negative offset; a leading "+" (or no sign) indicates a non-negative offset. The value is intended to specify the offset from UTC before the time zone transition, but its exact interpretation depends on the transition details. See the transition steps below for details.

cfg slot.s/mux/txifc.m/isdb NextTimeOffset

This value gives a signed offset between UTC and the local time, in hh:mm format. A leading "-" indicates a negative offset; a leading "+" (or no sign) indicates a non-negative offset. The value is intended to specify the offset from UTC after the time zone transition, but its exact interpretation depends on the transition details. See the transition steps below for details.

The system keeps its internal clock in UTC and does not maintain local time. Nevertheless, these DST transition parameters give a way to construct the appropriate local values for the system information tables.

- If the DST date and time indicate a future transition, the local time offset gives the current offset from UTC. That is, UTC plus local_time_offset gives the local time.
- To determine whether the transition has passed already, the system computes the local time as in the previous step. If the result is after the dst_date and dst_time, the local_time_offset is obsolete. At this point, UTC plus next_time_offset gives the true local time.
- If no time zone changes are necessary (such as the region not observing daylight saving time), the values should be set as follows. Set dst_date at least one year in the past (the default 2000-01-01 suffices). Set both local_time_offset and next_time_offset to indicate the current time zone offset from UTC. Technically, setting the dst_date a year in arrears tells the system to use local_time_offset, but setting both time offsets to the same value avoids confusion.

If the values indicate a DST transition should occur, the transition date will eventually arrive, trigger the change, and then recede. At that time, the next transition could be configured. To help alert the operator to an obsolete configuration, the system asserts an alarm (modDeg, Configuration Error) when the transition date is more than a couple of months in the past. The alarm is not asserted if the transition date is more than one year in the past.

Intro/Update: 7.3.0/7.3.0

cfg slot.s/mux/txifc.m/isdb **DstTime**

Value(s): text as hh:mm:ss

Description: Specifies the local time for the next time zone change.

Intro/Update: 7.3.0/7.3.0

cfg slot.s/mux/txifc.m/isdb **Eab**

Value(s): enable, disable

Description: Enables/disables emergency alarm broadcasting.

Intro/Update: 7.3.0/7.3.0

cfg slot.s/mux/txifc.m/isdb **EabSignalLevel**

Value(s): 0, 1

Description: Specifies the emergency alarm start signal type. An emergency message has two defined signal levels.

0 The first type of start signal.

1 The second type of start signal.

Intro/Update: 7.3.0/7.3.0

cfg slot.s/mux/txifc.m/isdb **GuardInterval**

Value(s): 1/4, 1/8, 1/16, 1/32

Description: Specifies the guard interval used in the modulation scheme.

Intro/Update: 7.3.0/7.3.0

cfg slot.s/mux/txifc.m/isdb **LocalTimeOffset**

Value(s): text as '±hh:mm'

Description: Specifies the offset of local time from UTC time before the daylight saving time transition. The range is -12:00 to +12:00. A plus sign is not required for non-negative numbers. See the DST date for details.

Intro/Update: 7.3.0/7.3.0

cfg slot.s/mux/txifc.m/isdb **Mode**

Value(s): 1, 2, 3

Description: Specifies the transmission mode.

Intro/Update: 7.3.0/7.3.0

cfg slot.s/mux/txifc.m/isdb **NextTimeOffset**

Value(s): text as '±hh:mm'

Description: Specifies the offset of local time from UTC time after the daylight saving time transition. The range is -12:00 to +12:00. A plus sign is allowed but not required for all non-negative numbers. See the DST date for details.

Intro/Update: 7.3.0/7.3.0

cfg slot.s/mux/txifc.m/isdb **PartialRx**

Value(s): diable, enable

Description: Enables/disables the inclusion of the partial reception descriptor. See the partial reception VC (cfg slot.s/mux/mxvc.m isdtvPartialVc) for details.

Intro/Update: 7.3.0/7.3.0

cfg slot.s/mux/txifc.m/isdb **Region**

Description: Specifies the region. Typically, this is a geographical region within the country, associated with this interface's transport stream. Zero indicates the absence of region information.

Intro/Update: 7.3.0/7.3.0

cfg slot.s/mux/txifc.m/isdb **HierAInnerCode**

cfg slot.s/mux/txifc.m/isdb **HierBInnerCode**

cfg slot.s/mux/txifc.m/isdb **HierCInnerCode**

Value(s): 1/2, 2/3, 3/4, 5/6, 7/8

Description: Specifies the forward error correction inner code for the designated hierarchy.
2/3 is the default for hierarchy A.
3/4 is the default for hierarchy B.
3/4 is the default for hierarchy C.

Intro/Update: 7.3.0/8.4.0

cfg slot.s/mux/txifc.m/isdb **HierAInterleave**

cfg slot.s/mux/txifc.m/isdb **HierBInterleave**

cfg slot.s/mux/txifc.m/isdb **HierCInterleave**

Value(s): 0, 1, 2, 4, 8, 16

Description: Specifies the multiplexer interleaving for the designated hierarchy. The interface's transmission mode (cfg slot.s/mux/txifc.m/isdb Mode) affects the values allowed for this parameter.
4is the default for hierarchy A.
2 is the default for hierarchy B.
2 is the default for hierarchy C.

Table 23-17 ISDB Mode and Interleave Value Settings Table

Mode Setting (cfg slot.s/mux/txifc.m/isdb Mode on page 277)	Interleave Values
1	0, 4, 8, 16
2	0, 2, 4, 8
3	0, 1, 2, 4

Mode Setting Possible ‘Interleave’ Values

Intro/Update: 7.3.0/8.4.0

cfg slot.s/mux/txifc.m/isdb **HierAMod**

cfg slot.s/mux/txifc.m/isdb **HierBMod**

cfg slot.s/mux/txifc.m/isdb **HierCMod**

Value(s): dqpsk, qpsk, 16qam, 64qam

Description: Specifies the hierarchy A or hierarchy B modulation scheme.
Mod-qpsk is the default for hierarchy A.
Mod-64qam is the default for hierarchy B.
Mod-64qam is the default for hierarchy C.

Intro/Update: 7.3.0/8.4.0

cfg slot.s/mux/txifc.m/isdb **HierASegments**

cfg slot.s/mux/txifc.m/isdb **HierBSegments**

cfg slot.s/mux/txifc.m/isdb **HierCSegments**

Value(s): 0 to 13

Description: Specifies the number of segments for the designated hierarchy. The total segment count (A plus B plus C) must equal 13.
1 is the default for hierarchy A,
12 is the default for hierarchy B
0 is the default for hierarchy C.

Intro/Update: 7.3.0/8.4.0

cfg slot.s/mux/txifc.m/isdb **HierATran**

cfg slot.s/mux/txifc.m/isdb **HierBTran**

cfg slot.s/mux/txifc.m/isdb **HierCTran**

Value(s): 0 to 255

Description: Specifies the transmission type information for the designated hierarchy. This 8-bit value is left to the discretion of the individual broadcaster.

Intro/Update: 7.3.0/8.40

cfg slot.s/mux/txifc.m/isdb **RemoteControl**

Value(s): 0 to 255

Description: Specifies the remote control key ID. This value assigns the “major channel number” to the transport stream. This value is the public-facing value used by the consumer to tune to the stream with a remote control.

Note: The operator is responsible for correctly setting this value.

Intro/Update: 7.3.0/7.3.0

23.1.39 TMX Mux VC Configuration Parameters

cfg slot.s/mux/mxvc.m

slot.s s = Slot number.
3–17 SYS-1700’s range of application module slot numbers.
2–4 SYS-200/SYS-300’s range of application module slot numbers.

mxvc.m m = Mux Virtual Channel (mxvc) number (1-63).

cfg slot.s/mux/mxvc.m **bisssw**

Value(s): <string>, <none>

Description: Specifies the BISS Session Word for this program. The encoder allows its Session Word to be written and read – unlike the decoder, which protects its Session Word from being read. A Session Word behaves like a "normal" configuration value. The encoder's Session Word is part of the system's configuration and may be stored internally a profile. Loading a stored profile or configuration file can alter Session Words for the system's encoders. Additionally, a Session Word follows the active service during module failover and failback.

<none> When no BISS scrambling is desired (or allowed), this value may be the empty string.

<string> Specifies the Session Word; a 12-character, hexadecimal string, such as 0a3b5c7d9e1f (upper-case and lower-case letters allowed).

Note: This hexadecimal string does not require an "0x" prefix.

Intro/Update: 7.5.0/7.5.0

cfg slot.s/mux/mxvc.m **descriptors**

Value(s): Two pairs of two-digit hex values separated by colons

Description: Specifies the descriptor carried by this VC. Descriptors have the following form. The descriptor tag, as detailed in the MPEG specification (ITU-T Rec. H.222.0, Section 2.6, Table 2-39)

Length Indicates the length of the Descriptor Data field (below) in bytes.

Data N-bytes of Descriptor Data.

The VC's Function (cfg slot.s/mux/mxvc.m function) and Program Number (cfg slot.s/mux/mxvc.m prognum) affect the way that the descriptor is treated as described in Table 23-18 below.

Table 23-18 VC Descriptor Processing Based on VC Function and Program Number

MX VC Function	Program Number	
ca	ignored	The descriptor is discarded
pid	0	Discard the descriptors. The selected PID's packets are inserted into the transport stream, but the PID is not added to the PAT or any PMT.
pid	non-zero	First, identify the channel carrying the indicated program by matching the program number. Then insert the descriptors at the element level in the PMT, associated with this channel's program element entry.
program, transrate	any	Insert the descriptors at the program level in the PMT, not associated with any particular program element.

Intro/Update: 6.5.0/6.5.0

cfg slot.s/mux/mxvc.m **dropca**

Value(s): enable, disable

Description: Enables/disables the disposal of Conditional Access (CA) data on this VC.

enable Directs the VC to discard all CA information. Specifically, the Entitlement Control Message (ECM) stream, and any CA descriptors, referenced through the PMT.

disable (default) Allows the VC to pass CA information intact.

Note 1: This parameter is ignored when the VC is on an internal interface.

Note 2: This parameter is ignored when the interface is operating in passthrough mode.

Note 3: This parameter is ignored when the VC's "Function" is set to "CA", thereby designating it to carry Conditional Access information.

Intro/Update: 6.0.0/6.0.0

cfg slot.s/mux/mxvc.m **encryptmode**

Value(s): biss, <none>

Description: Specifies the encryption mode for this program. With encryption operating, an encoder can scramble its output and pass that stream over an insecure medium to an authorized decoder, which can unscramble the stream.

none Disables encryption. The encoder generates unscrambled output.

biss Enables BISS encryption. This option directs the encoder to use its BISS session word (specified by cfg slot.s/mux/mxvc.m bisssw above) to scramble the output MPEG stream. A decoder will need the Session Word in order to decrypt the stream. If an encoder's BISS is enabled without having a Session Word, the encoder asserts an alarm (See the "Module Degrade - Configuration Error" command on page 431). For details, see EBU Technical Specification Tech 3292 (rev. 2, August 2002), BISS-E, Basic Interoperable Scrambling System with Encrypted Keys.

Intro/Update: 7.5.0/7.5.0

cfg slot.s/mux/mxvc.m **function**

Value(s): ca, PID, program, transrate

Description: Specifies the payload type for this virtual channel. The multiplexer VC ignores the function when the VC's interface is an internal demultiplexer receiving its MPTS input through this VC.
Some function values consume limited internal resources. If any constraints are violated, the module will declare an alarm (Module Degrade - Configuration Error).

ca This VC will carry conditional access information. Many transport streams carry conditional access data, supporting encryption services to protect a stream's contents. When a VC's function is set to this value, the PIDs referenced in the VC's input conditional access table are multiplexed into the transport stream for the referenced interface, and the conditional access table is constructed appropriately. A multiplexer interface may have no more than one conditional access VC.

MPH Use this setting when the interface on which the VC is located is configured for 'MPH'.

pid This VC insert a single PID's packets into the transport stream. The module isolates the selected packets (see the VC's cfg slot.s/mux/mxvc.m pid for details), drops all other packets in the VC (if any), remaps the selected packets to the VC's PID, and inserts those packets into the interface's multiplex. The behavior with respect to PAT and PMT entries depends on this VC's program number (cfg slot.s/mux/mxvc.m prognum) as described in Table 23-19 below.

Table 23-19 Function Behavior in PID Mode

VC Program Number	Behavior
0	The PID is not added to the PAT or any PMT.
Non-zero	The system searches for another channel on the same interface that carries a matching program (its function should be {program, transrate}, and the program number should match this channel's value). This channel's PID is then added as a program element to the identified program, including the associated PMT entry. The channel's configured stream type is used in the element's PMT entry. If no matching program channel exists, the channel asserts an alarm (vcDeg, configuration error).

When a PID is configured for individual insertion, no other VC on the same interface should insert packets on that PID, either explicitly or implicitly. The module asserts an alarm (VC Degrade - Configuration Error) if this constraint is violated.
Note: The PID function supports "unusual" applications and might require application engineering support to configure correctly. The VC inserting this single PID may be connected like a normal multiplexer virtual VC. The most useful source is likely to be a demultiplexer VC, whose function is set to extract a specific PID from a multiplex.

program Use this setting to multiplex the program carried on this VC into the transport stream. The module builds the transport stream's PAT based on the VC's program number (cfg slot.s/mux/mxvc.m prognum). The transport stream is provided on the specified interface.

transrate This function extends "program". In addition to the program behavior, this function can re-code a program's video to adjust the total bandwidth. Transrating will not increase the bandwidth (the stream does not contain enough information to improve the picture quality by raising the rate). If transrating fails to achieve sufficient reduction, the VC will assert an alarm (VC Degrade - Configuration Errorr).

Note 1: The VC's function setting is ignored under the following conditions.
(a) The VC's interface is an internal multiplexer sending its MPTS output through this VC.
(b) The VC's interface is an external receiver with pass through enabled.

Note 2: Some function values consume limited internal resources. If any constraints are violated, the module will declare an alarm (Module Degrade - Configuration Error).

Intro/Update: 5.7.0/8.0.0

cfg slot.s/mux/mxvc.m **lfc**

Value(s): dx-1, dx-2, dx-3, dx-4, dx-5, dx-6, dx-7, dx-8, mx-1, mx-2, mx-3, mx-4, mx-5, mx-6, mx-7, mx-8, tx-1, tx-2

Description: Specifies the interface to which this Mux VC sends data.

Intro/Update: 3.1.0/4/0.0

cfg slot.s/mux/mxvc.m **isdtvHierarchy**

Value(s): A, B

Description: Specifies the ISDTV hierarchy for this VC.

This channel parameter determines whether to use the interface's hierarchy A or hierarchy B parameters (such as the inner FEC code, among others). See the ISDTV configuration group for a complete list.

This parameter is active only under the following conditions:

Note 1: The channel's interface designates a transmit interface;

Note 2: That transmit interface's transport stream is configured for ISDTV, by setting the S-I mode to {isdtv} or the standard to {asi-isdtv}.

Intro/Update: 7.2.0/7.2.0

cfg slot.s/mux/mxvc.m **isdtvPartialVc**

Value(s): 0 to 63

Description: This parameter specifies the backup A channel that a hierarchy B ISDTV channel should use in a partial reception condition. The hierarchy A backup channel should be assigned to the same transmit interface as this channel.

ISDTV can use hierarchy A and B programs in pairs. The paired programs typically use different levels of error correction, resolutions, and rates. If the main program (in hierarchy B) has poor reception, the receiver can opt to decode the designated backup program (in hierarchy A).

0 This value explicitly signifies this channel has no assigned backup for partial reception conditions.

1 to 63 These values specify the VC index of the backup channel. The transport stream will carry the backup's program number, but this parameter is the channel index.

This parameter is active only under the following conditions:

Note 1: The channel's interface designates a transmit interface;

Note 2: That transmit interface's transport stream is configured for ISDTV, by setting the S-I mode (cfg slot.s/mux/txifc.m simode) to 'isdtv' or the standard to 'asi-isdtv'.

Note 3: That transmit interface has partial reception descriptor enabled;

Note 4: This channel is assigned to hierarchy B.

Intro/Update: 7.2.0/7.2.0

cfg slot.s/mux/mxvc.m **majorchan**

Value(s): 0, 1 to 99 (terrestrial), 1 to 999 (cable)

Description: Specifies the ATSC major channel number applied to the program entering the multiplex through this VC. If the interface's system information mode (cfg slot.s/mux/txifc.m simode) is set to 'ATSC', then this value is used for the program's major channel number (see the virtual channel table in ATSC A/65). Other SI modes ignore this value.

0 If the incoming MPEG stream for this VC also carries a VCT (and it normally should), zero instructs the multiplexer to preserve the program's major and minor channel numbers in the multi-program transport stream of the associated interface.

1-99, 1-999 The VCT's range is 1 to 99 (for terrestrial) and 1 to 999 (for cable). A non-zero major channel number tells the multiplexer to use the VC's configured major and minor channel values in the output VCT.

The multiplexer channel ignores this value in the following cases:

Note 1: The channel's interface is an internal demultiplexer receiving its MPTS input through this channel.

Note 2: The channel's interface is an external transmitter with pass-through enabled.

Note 3: The channel does not carry a program. That is, the function is other than {logo, program, splice, transrate}.

Intro/Update: 5.5.0/7.2.0

cfg slot.s/mux/mxvc.m **minorchan**

Value(s): 0 to 999

Description: Specifies the ATSC minor channel number for this VC. If the interface's system information mode is set for ATSC, this value is used for the a program's minor channel number (see the virtual channel table in ATSC A/65). Other SI modes ignore this value.

Intro/Update: 5.5.0/5.5.0

cfg slot.s/mux/mxvc.m **pid**

Value(s): -1, 1 to 8190

Description: Specifies the packet identifier associated with this VC. When the VC's function (cfg slot.s/mux/dxvc.m function) is “PID” the packet identifier specifies the PID to use for packets inserted from this VC into the interface's transport stream. Other functions ignore the packet identifier value.

-1 (Default) A PID of this value cannot occur in an MPEG stream. If the VC is configured for single-PID processing, this gives a “safe” default value that explicitly avoids insertion for the VC. Additionally, VCs configured for other functions can use -1 to indicate the absence of specific PID insertion.

0 PID value zero carries the program association table (PAT). This table provides information describing individual programs for the transport stream. The prohibition on supplying a PID from multiple sources also applies to the PAT. The PAT's PID should not be inserted individually, because the module itself builds the PAT and inserts it into the transport stream. If this parameter is set to zero, the module will declare an alarm (vcDeg, configuration error).

1 to 8190 Packets from the VC's PID 42 are remapped to the specified PID before transferring them to the interface. When processing single programs, the system uses program 1 and starts the PIDs at 32. For a full program, PID 42 corresponds to the first assigned data PID within the program. Because a single inserted PID normally would carry data, the input PID 42 is remapped to the configured PID value and those packets are inserted into the multiplex. For symmetry, a demultiplexer VC that extracts a single PID also maps its packets to PID 42.
When generating the interface's transport stream, packets for a particular PID should be inserted from no more than one VC, either explicitly by using the “PID” function, or implicitly by using other function values. For example, if another VC supplies a program (specified through the function and program number) that contributes a PID to the multiplex, that packet identifier should not additionally be inserted by itself.

Note: Packets from this particular PID for this channel can be inserted directly into the interface's transport stream, or they can be added as an element in a program associated with another channel. See function {pid} for details.

Intro/Update: 5.7.0/6.5.0

cfg slot.s/mux/mxvc.m **prognum**

Value(s): 0, 1 to 65535

Description: Use this control to specify the program number that shall identify the program on this VC in the multiplexed multi-program transport stream (MPTS).

0 If the input program number is zero, data from the channel will be inserted into the MPTS without adding an entry to the PAT. This can be used, for example, when an external entity generates system tables or other control information that do not belong in the PAT.

1 to 65535 This program number can be used to determine the PID values for the transport stream. The channel's interface specifies how these PIDs are determined (cfg slot.s/mux/mxifc.m pidmap for details). Beginning with release 7.0.0 the module strips null packets from video entering the system in this manner.

Note 1: Currently, the pair (interface, program number) must be unique for non-zero program numbers, when the channel's function is set to either “program” or “transrate”. For other function types, consult the function entry (cfg slot.s/mux/mxvc.m function) for details.

Note 2: * Availability of this selection is determined by the module’s feature profile.
See Table 20-1, "TMX-M12 Faceplate" on page 147. See also util key .

Intro/Update: 3.1.0/7.0.0

cfg slot.s/mux/mxvc.m **protection**

Value(s): high, low

Description: Specifies this VC's protection level.

This parameter applies to VCs assigned to a transmit interface. If the transmit rate is about to be exceeded (leading to transmit buffer overflow), the interface first discards packets from VCs assigned to “low” in order to avoid dropping packets from VCs assigned to “high”. The interface will drop high-priority traffic if necessary, but only after first dropping all low-priority packets.

Note 1: This parameter has the following prerequisites.

- The VC's interface is not an external transmitter.
- The VC's interface is an external transmitter with pass-through enabled.
- The VC's interface has its ‘SI Mode’ (cfg slot.s/mux/mxifc.m simode) set to either ‘isdb’, or to ‘mph’.
- The VC's interface has one or more VCs that enable statistical multiplexing. .

Note 2: Any dropped packet, whether high or low protection, contributes to transmit buffer overlow.

Intro/Update: 7.8.0/7.8.0

cfg slot.s/mux/mxvc.m **rate**

Value(s): 0, 1 to 214 mbps

Description: Specifies the rate for this virtual VC. When multiplexing a transport stream, the individual contributing VCs have bandwidths established by their sources. Depending on the VC's function (cfg slot.s/mux/mxvc.m function), this rate lets the system enforce an upper bound on a program's total transport stream bandwidth without affecting other programs in the multiplex.

0 Disables policing and transrating.

1 to 214 Specifies the maximum transport stream rate.

ca, pid, program The configured rate does not change the actual bandwidth for these functions. It can be used for statistical multiplexing.

transrate This stream is re-coded using the specified rate as an upper bound. Though the stream may suffer some loss of video quality, the module attempts to adjust the video bandwidth as needed. If transrating fails to achieve sufficient reduction, the VC will assert an alarm (VC Degrade - Configuration Error). If the VC actually consumes less bandwidth than this configured upper bound, the stream is unaffected.
When a VC enables statistical multiplexing, this rate serves as a guideline, not an upper bound. If transrating occurs in conjunction with statistical multiplexing, the VC's actual rate may be more or less than the configured rate, depending on other VCs on the same interface.

Note 1: The multiplexer VC ignores this setting when the VC's interface is an internal demultiplexer receiving its MPTS input through this VC.

Note 2: The multiplexer VC ignores this setting when the VC's function (cfg slot.s/mux/mxvc.m function) is either “ca” or “program”.

Intro/Update: 5.7.0/5.7.0

cfg slot.s/mux/mxvc.m **rowstate**

Value(s): active, create, destroy, inactive

Description: Specifies this row's state.

*active ** The entry is allocated and enabled for service. As described above, the system checks various rules before activating an entry.

create To create a new entry in the table, a manager selects an index (more on this below) and tries to set that row's state to create. If the index is valid and that row is not allocated in the table, the system creates a new row at the specified index. Otherwise the SET operation fails. After creating a new row in the table, the system sets its state to inactive.

destroy Setting a row's state to this value eliminates the row from the table. Any row can be destroyed, regardless of its current state or whether it actually exists.

inactive The entry is allocated but not currently carrying a service.

* Availability of this selection is determined by the module’s feature profile.

Intro/Update: 3.1.0/4/0.0

cfg slot.s/mux/mxvc.m **smDistIpAddr**

Value(s): IP Address

Description: Specifies the IP address for a distributed encoder in a statmux group. A statistical multiplexing group receives input through the statmux VCs for its interface.

Until release 7.3.0 all statmux VCs had to be connected to a 'local' encoder. 'Local' meaning an encoder residing in the same system as the TMX module.

Beginning with release 7.3.0, the encoder can reside in another system, connected to this control module through some external communication path (ATM, ethernet, etc.).

0.0.0.0 A value of zero means the channel has a local source.

#.#.#.# A non-zero IP address indicates this channel is connected to an encoder in an external NetVX™ system. Together, this IP address and the slot number identify the remote system and encoder supplying this channel's transport stream.

Note 1: Note that both the IP address (cfg slot.s/mux/mxvc.m smDistIpAddr) and the slot number (cfg slot.s/mux/mxvc.m smDistSlot) must be non-zero to fully identify an external encoder.

Note 2: This parameter is ignored if the VC is not part of a StatMux Group.

Intro/Update: 7.3.0/7.3.0

cfg slot.s/mux/mxvc.m **smDistSlot**

Value(s): 0, 1 to 17 (Default 0)

Description: Specifies the slot number for a distributed encoder in a statmux group.

0 Indicates no distributed encoder is used.

1–17 Specifies the slot in which the distributed encoder is located.

Note 1: Note that both the IP address (cfg slot.s/mux/mxvc.m smDistIpAddr) and the slot number (cfg slot.s/mux/mxvc.m smDistSlot) must be non-zero to fully identify an external encoder.

Note 2: This parameter is ignored if the VC is not part of a StatMux Group.

Intro/Update: 7.3.0/7.3.0

cfg slot.s/mux/mxvc.m **smmaxrate**

Description: 0.00 to 80.00 Mbps (see range details below)

Description: Specifies the maximum statmux bitrate for this VC. When a VC participates in a statistical multiplexing group, this parameter helps control the bandwidth allocation (and picture quality) for the VC. Setting a maximum bitrate limits the bandwidth allocation for a particular VC. Typically, this would be used to prevent a VC from "borrowing" bandwidth from other group members, when it carries less important material than other group members. The VC can be given less bandwidth than the maximum value.

When a statistically multiplexed VC is connected to a local encoder, the system can enforce additional constraints on the statmux bandwidth. These constraints can be enforced dynamically, because the cross connections might be unknown when a VC's maximum value is configured. The system can reduce a VC's working maximum below the configured value, if it decides that is necessary.

0 The maximum bitrate is unconstrained. This gives the system the most latitude to improve overall picture quality of the group, perhaps at the momentary expense of individual group members.

1 to 15 Range of rates for Standard-Definition encoders.

7 to 80 Range of rates for High-Definition encoders.

Note: This parameter is ignored if the VC is not part of a StatMux Group.

Intro/Update: 6.6.0/6.6.0

cfg slot.s/mux/mxvc.m **smminrate**

Value(s): 0.00 to 80.00 Mbps (see range details below)

Description: Specifies the minimum StatMux bitrate for this VC. When a VC participates in a statistical multiplexing group, this parameter helps control the bandwidth allocation (and picture quality) for the VC.

Setting a minimum bitrate ensures a given bandwidth allocation for a particular VC. Typically, this would be used for VCs that need to avoid bitrate "starvation" thus preserving a certain level of picture quality regardless of the activity on other VCs in the group. The VC can also be given more bandwidth than the minimum value.

When a statistically multiplexed VC is connected to a local encoder, the system can enforce additional constraints on the statmux bandwidth. These constraints can be enforced dynamically, because the cross connections might be unknown when a VC's minimum value is configured. The system can increase a VC's working minimum above the configured value, if it decides that is necessary.

0 The minimum bitrate is unconstrained. This gives the system the most latitude to improve overall picture quality of the group, perhaps at the momentary expense of individual group members.

1 to 15 Range of rates for Standard-Definition encoders.

7 to 80 Range of rates for High-Definition encoders.

Note 1: This parameter is ignored if the VC is not part of a StatMux Group.

Intro/Update: 6.6.0/6.6.0

cfg slot.s/mux/mxvc.m **smpriority**

Value(s): 1 to 10

Description: Specifies this VC's priority within its statistical multiplexing group.

The NetVX™ uses this value as it adjusts picture quality among StatMux Group members. VCs with lower numerical priority values are considered higher priority and receive preference. The value is meaningful only when compared with other VCs in its statistical multiplexing group.

1-10 '1' is the most preferred. '10' is the least-preferred.

5 Default setting.

Note 1: This parameter is ignored if the VC is not part of a StatMux Group.

Note 2: This parameter's effect depends on numerous factors: the other priorities in the statistical multiplexing group, the bitrate available to the group, the bitrate available to the individual VC, the complexity of the video being coded, the complexity of video being handled by other VCs in the group, etc. When configuring priorities for a group, it is advisable to experiment with representative video streams, adjusting relative priorities until they suit the application.

Intro/Update: 6.6.0/6.6.0

cfg slot.s/mux/mxvc.m **statmux**

Value(s): enable, disable

Description: Enables/disables this VC's participation in the TS transmitter's stat mux group. Given typical video input, MPEG encoding needs varying bandwidth over time to maintain consistent picture quality. Statistical multiplexing lets a group of programs take advantage of these bandwidth peaks and valleys. A program that encounters easy material can "donate" its extra bandwidth to other programs that are coding more difficult video.

Intro/Update: 6.5.0/6.5.0

cfg slot.s/mux/mxvc.m **streamtype**

Value(s): 0 to 0xff

Description: Specifies the stream type for this VC's program element. This 8-bit field specifies the type of the program element carried in the transport stream packets. See the MPEG specification (ITU-T Rec. H.222.0, Section 2.4.4.9, Table 2-29) for details on the stream type.

0 Configuring the VC's type as zero (a reserved value in the MPEG specification) tells the system to preserve any type already associated with the VC.

non-zero A non-zero value explicitly sets (or replaces) the VC's stream type.

This value applies only when the VC inserts a single program element into a program of the transport stream, such as when the function is pid and the program number is non-zero. In this case, the stream type should be non-zero; the VC asserts an alarm otherwise (vcDeg, configuration error). A VC that carries multiple program elements (a function of program, for example), does not use the stream type value.

Intro/Update: 6.5.0/6.5.0

cfg slot.s/mux/mxvc.m **tag**

Value(s): Any text string up to 31 characters.

Description: Specifies a name for this Mux VC.

Intro/Update: 3.1.0/3.1.0

cfg slot.s/mux/mxvc.m **vcdeg**

Value(s): enable, disable

Description: Enables/disables this VC's degrade alarms.

Intro/Update: 3.1.0/3.1.0

cfg slot.s/mux/mxvc.m **vcflt**

Value(s): enable, disable

Description: Enables or disables fault alarms for this VC.

Note: Use the cfg sys/alm vcFaultSev command to set this alarm's severity level.

Intro/Update: 6.5.0/6.5.0

cfg slot.s/mux/mxvc.m **vcflt**

Value(s): off, on

Description: Specifies the visibility flag for the VC's service. See cfg slot.s/mux/mxvc.m majorchan for details.

A multiplexer channel ignores the visibility flag when the channel's interface is an internal demultiplexer receiving its MPTS input through this channel.

Intro/Update: 7.7.0/7.7.0

23.1.40 TMX Mux VC Program Configuration Parameters

cfg slot.s/mux/mxvc.m/pgm

slot.s s = Slot number.

3–17 SYS-1700's range of application module slot numbers.

2–4 SYS-200/SYS-300's range of application module slot numbers.

mxvc.m m = Mux Virtual Channel (mxvc) number (1–63).

Note: Use this section's commands to specify individual PID values. Thes values are used when the interface on which the VC is located is configured to operate in "Manual" mode. These manually-specified PID values are ignored if any of the following conditions exist.

- The VC's interface is an internal demultiplexer receiving its MPTS input through this VC.
- The VC's function is "ca", which specifies direct insertion into the transport stream without PID remapping.
- The VC's function is either "program" or "transrate" and the program number is zero. These options specify direct insertion into the transport stream without PID remapping.
- The VC's function is "PID", specifying extraction of a single packet identifier for insertion into the transport ream.
- The VC's interface is an external transmitter with pass-through enabled.
- The VC's interface is configured to use automatic PID assignment (cfg slot.s/mux/mxifc.m pidmap , cfg slot.s/mux/txifc.m pidmap).

cfg slot.s/mux/mxvc.m/pgm **audpid**

Value(s): -1, 16–8090, 8191

Description: Specifies the initial audio packet identifier for this VC. This parameter is only applicable when the interface-level "PID Map" command is set to "Manual" (cfg slot.s/mux/mxifc.m pidmap , cfg slot.s/mux/txifc.m pidmap). If the program has multiple audio streams, subsequent PIDs are assigned consecutively.

-1 This default value, -1, cannot occur in an MPEG stream. VCs configured for automatic PID assignment can use -1 to indicate the absence of specific PID assignment.

0–15 These values are reserved to carry the program association table (PAT) and other standard tables. If the VC is configured for manual PID assignment and this parameter is set to a value between -1 and 15 while the VC is active, the module will declare an alarm (vcDeg, configuration error).

16–8090 Range of possible PID values.

8191 Specifies this VC carries only null packets. This parameter's upper bound, 8190, excludes the null PID.

Note: See the "Notes" at the beginning of this section for command restrictions.

Intro/Update: 6.0.0/6.0.0

cfg slot.s/mux/mxvc.m/pgm **datapid**

Value(s): -1, 16–8090, 8191

Description: Specifies the initial data packet identifier for this VC. This parameter is only applicable when the interface-level “PID Map” command is set to “Manual” (cfg slot.s/mux/mxifc.m pidmap , cfg slot.s/mux/txifc.m pidmap). If the program has multiple data streams, subsequent PIDs are assigned consecutively.

-1 This default value, -1, cannot occur in an MPEG stream. VCs configured for automatic PID assignment can use -1 to indicate the absence of specific PID assignment.

0–15 These values are reserved to carry the program association table (PAT) and other standard tables. If the VC is configured for manual PID assignment and this parameter is set to a value between -1 and 15 while the VC is active, the module will declare an alarm (vcDeg, configuration error).

16–8090 Range of possible PID values.

8191 Specifies this VC carries only null packets. This parameter's upper bound, 8190, excludes the null PID.

Note: See the “Notes” at the beginning of this section for command restrictions.

Intro/Update: 6.0.0/6.0.0

cfg slot.s/mux/mxvc.m/pgm **ecmpid**

Value(s): -1, 16–8090, 8191

Description: Specifies the initial ECM packet identifier for this VC. This parameter is only applicable when the interface-level “PID Map” command is set to “Manual” (cfg slot.s/mux/mxifc.m pidmap , cfg slot.s/mux/txifc.m pidmap). If the program has multiple ECM streams, subsequent PIDs are assigned consecutively.

-1 This default value, -1, cannot occur in an MPEG stream. VCs configured for automatic PID assignment can use -1 to indicate the absence of specific PID assignment.

0–15 These values are reserved to carry the program association table (PAT) and other standard tables. If the VC is configured for manual PID assignment and this parameter is set to a value between -1 and 15 while the VC is active, the module will declare an alarm (vcDeg, configuration error).

16–8090 Range of possible PID values.

8191 Specifies this VC carries only null packets. This parameter's upper bound, 8190, excludes the null PID.

Note: See the “Notes” at the beginning of this section for command restrictions.

Intro/Update: 6.0.0/6.0.0

cfg slot.s/mux/mxvc.m/pgm **pcrpid**

Value(s): -1, 16–8090, 8191

Description: Specifies the packet identifier that carries PCRs for this VC. This parameter is only applicable when the interface-level “PID Map” command is set to “Manual” (cfg slot.s/mux/mxifc.m pidmap , cfg slot.s/mux/txifc.m pidmap).
The PCR packet identifier is used as needed for a VC. The multiplexer examines the incoming program to see if the PCR PID noted in the PMT matches a value in the PMT's stream table. If so, the multiplexer automatically remaps the PCR PID in the PMT to match the referenced stream (audio, video, etc.), and this pcrPid parameter is ignored. If the incoming PMT's PCR packet identifier does not match a stream in the PMT loop, this parameter's value gives the packet identifier for the outgoing program's remapped PCR PID.

-1 This default value, -1, cannot occur in an MPEG stream. VCs configured for automatic PID assignment can use -1 to indicate the absence of specific PID assignment.

0–15 These values are reserved to carry the program association table (PAT) and other standard tables. If the VC is configured for manual PID assignment and this parameter is set to a value between -1 and 15 while the VC is active, the module will declare an alarm (vcDeg, configuration error).

16–8090 Range of possible PID values.

8191 Specifies this VC carries only null packets. This parameter's upper bound, 8190, excludes the null PID.

Note: See the “Notes” at the beginning of this section for command restrictions.

Intro/Update: 6.0.0/6.0.0

cfg slot.s/mux/mxvc.m/pgm **pmtpid**

Value(s): -1, 16–8090, 8191

Description: Specifies the packet identifier that carries the PMT for this VC. This parameter is only applicable when the interface-level “PID Map” command is set to “Manual” (cfg slot.s/mux/mxifc.m pidmap , cfg slot.s/mux/txifc.m pidmap).

-1 This default value, -1, cannot occur in an MPEG stream. VCs configured for automatic PID assignment can use -1 to indicate the absence of specific PID assignment.

0–15 These values are reserved to carry the program association table (PAT) and other standard tables. If the VC is configured for manual PID assignment and this parameter is set to a value between -1 and 15 while the VC is active, the module will declare an alarm (vcDeg, configuration error).

16–8090 Range of possible PID values.

8191 Specifies this VC carries only null packets. This parameter's upper bound, 8190, excludes the null PID.

Note: See the “Notes” at the beginning of this section for command restrictions.

Intro/Update: 6.0.0/6.0.0

cfg slot.s/mux/mxvc.m/pgm **vidpid**

Value(s): -1, 16–8090, 8191

Description: Specifies the initial video packet identifier for this VC. This parameter is only applicable when the interface-level “PID Map” command is set to “Manual” (cfg slot.s/mux/mxifc.m pidmap , cfg slot.s/mux/txifc.m pidmap).

-1 This default value, -1, cannot occur in an MPEG stream. VCs configured for automatic PID assignment can use -1 to indicate the absence of specific PID assignment.

0–15 These values are reserved to carry the program association table (PAT) and other standard tables. If the VC is configured for manual PID assignment and this parameter is set to a value between -1 and 15 while the VC is active, the module will declare an alarm (vcDeg, configuration error).

16–8090 Range of possible PID values.

8191 Specifies this VC carries only null packets. This parameter's upper bound, 8190, excludes the null PID.

Note: See the “Notes” at the beginning of this section for command restrictions.

Intro/Update: 6.0.0/6.0.0

23.1.41 TMX Rx Interface Configuration Parameters

cfg slot.s/mux/rxifc.m

slot.s s = Slot number.
3–17 SYS-1700's range of application module slot numbers.
2–4 SYS-200/SYS-300's range of application module slot numbers.

rxifc.m m = Receive interface (rxifc) number (1–2)
rxifc.1* Specifies the TMX module's "In 1" ASI/310M receive interface.
rxifc.2* Specifies the TMX module's "In 2" ASI/310M receive interface.
* Availability of this selection is determined by the module's feature profile.

cfg slot.s/mux/rxifc.m **mode**

Value(s): OFF, rxonly
Description: Enables/disables the specified receive interface.
OFF Marks the interface as non-operational. Virtual Channels may be associated with the interface, but those channels will carry no traffic.
rxonly Puts the interface into receive-only mode. To the extent possible, this value decouples the transmit and receiver interfaces.
Note: * Availability of this selection is determined by the module's feature profile.
See Table 19-5, "DEC-S11 Module Type Definitions" on page 142. See also util key .
Intro/Update: 4.0.0/4.0.0

cfg slot.s/mux/rxifc.m **netdeg**

Value(s): enable, disable
Description: Enables/disables the interface's network degrade alarms.
Note: Use the cfg sys/alm netDegSev command to set this alarm's severity level.
Intro/Update: 3.1.0/3.1.0

cfg slot.s/mux/rxifc.m **netflt**

Value(s): enable, disable
Description: Enables/disables the interface's network fault alarms.
Note: Use the cfg sys/alm netFltSev command to set this alarm's severity level.
Intro/Update: 3.1.0/3.1.0

cfg slot.s/mux/rxifc.m **passthrough**

Value(s): enable, disable
Description: Specifies whether the incoming signal should bypass the interface's demultiplexer.
disable The demultiplexer interface receives a multi-program transport stream via either the "In 1" or "In 2" port. It then demultiplexes this stream into one or more single-program transport streams. Each program may be directed to its own VC and each such VC may serve as a cross connection source.
enable The interface receives one multi-program transport stream as input and makes that stream available on one VC which may then serve as a cross connection source.
Note: Passthrough is disabled if more than one VC is configured to operate on this interface. To re-enable Passthrough, delete all but one VC and enable this control.
Intro/Update: 3.1.0/4/0.0

cfg slot.s/mux/rxifc.m **simode**

Value(s): dvb, mpeg

Description: Specifies the system information table paradigm.

dvb Processes and preserves Digital Video Broadcasting (DVB) control tables. This setting forward the SDT on PID 17 through the demultiplexer.

mpeg Processes and preserves only generic MPEG control tables. This setting discards MPEG application-specific SDTs.

atsc Processes and preserves only generic ATSC control tables.

Intro/Update: 4.0.0/5.6.0

cfg slot.s/mux/rxifc.m **standard**

Value(s): asi, auto, smpte-310m

Description: Specifies the receiver interface standard. The physical interface determines what configuration values are appropriate.

asi Configures this interface to receive Asynchronous Serial Interface (ASI). The receiver automatically adapts to 188-byte or 204-byte packets.

auto Configures this interface to detect whether the input it receives is ASI or SMPTE-310M.

smpte-310M Configures this interface to receive SMPTE-310M, which runs at a fixed rate of 19.39265846 Mbps with 188-byte packets.

Note 1: The TMX-* modules have independent transmit and receive hardware. The receive interface standard is independent from the transmitter's configuration.

Note 2: If the module is configured for external loopback, a receiver's standard can alter the transmitter's configured value. The transmitter's status always shows the standard in use.

Intro/Update: 7.0.0/7.0.0

cfg slot.s/mux/rxifc.m **tag**

Value(s): Any text string up to 31 characters.

Description: Specifies a name for this mux receive interface.

Intro/Update: 3.1.0/3.1.0

23.1.42 TMX Rx Interface Router Parameters

cfg slot.s/mux/rxIfc.m/rtr

slot.s s = Slot number.
3–17 SYS-1700's range of application module slot numbers.
2–4 SYS-200/SYS-300's range of application module slot numbers.

rxifc.m m = Receive interface (rxifc) number (1–2)
rxifc.1* Specifies the TMX module's "In 1" ASI/310M receive interface.
rxifc.2* Specifies the TMX module's "In 2" ASI/310M receive interface.
* Availability of this selection is determined by the module's feature profile.

cfg slot.s/mux/rxIfc.m/rtr **in**

Value(s): 1–n (n = the number of router inputs)
Description: Specifies the router (input) port receiving its signal directly from the transport stream source. Example: On a 12x1 router, valid values for this item would range from 1 to 12.
Intro/Update: 3.1.0/3.1.0

cfg slot.s/mux/rxIfc.m/rtr **lvl**

Value(s): 0 to 15
Description: Specifies the router level to associate with this signal.
Intro/Update: 3.1.0/3.1.0

cfg slot.s/mux/rxIfc.m/rtr **out**

Value(s): Specifies the router (output) port transmitting its signal to this TMX receive interface.
Description: Specifies router output port that connects to this mux receive interface.
Intro/Update: 3.1.0/3.1.0

23.1.43 TMX Tx Interface Configuration Parameters

cfg slot.s/mux/txifc.m

slot.s s = Slot number.
3–17 SYS-1700's range of application module slot numbers.
2–4 SYS-200/SYS-300's range of application module slot numbers.

txifc.m m = Transmit interface (txifc) number (1–2)
txifc.1 Specifies the TMX module's "Out 1" ASI/310M transmit interface.
txifc.2* Specifies the TMX module's "Out 2" ASI/310M transmit interface.
* Availability of this selection is determined by the module's feature profile.

cfg slot.s/mux/txifc.m **carrierfreq**

Value(s): 0.000000 to 4294.967295 MHz

Description: Specifies the ATSC carrier frequency for this stream. If the interface's system information mode (cfg slot.s/mux/txifc.m simode) is set for ATSC, this value is used for the carrier frequency (see the virtual channel table in ATSC A/65). Other SI modes ignore this value.

For US terrestrial channels, the carrier frequencies depend on the modulation mode, which can be analog or digital. We currently assume digital modulation (8 VSB), giving the following frequency assignments. Every channel occupies a 6 MHz band within its range, so the base frequencies for channels 2, 3, and 4 are 54 MHz, 60 MHz, and 66 MHz. ATSC digital channels use the base frequency plus 310 KHz.

Table 23-20 Channel/Frequency Ranges

Channels	Frequency Range (MHz)	Nominal Frequency (MHz)
2 to 4	54 to 72	(channel - 2) * 6 + 54 + 0.310
5 to 6	76 to 88	(channel - 5) * 6 + 76 + 0.310
7 to 13	174 to 216	(channel - 7) * 6 + 174 + 0.310
14 to 69	470 to 806	(channel - 14) * 6 + 470 + 0.310

Small adjustments are possible to reduce interference between stations that broadcast on the same channel (such as two stations in New York and Philadelphia). Consequently, the computed frequency should be adjustable.

Note 1: A/65 associates a carrier frequency with each channel in the virtual channel table, but all channels in a transport stream are broadcast together, at the same carrier frequency. Consequently, this carrier frequency parameter is assigned to the interface (transport stream), not to an individual VC.

Note 2: Despite nomenclature that suggests otherwise, the channel used to compute the carrier frequency is unrelated to the major and minor channel numbers assigned to a component of the transport stream.

Intro/Update: 5.5.0/5.5.0

cfg slot.s/mux/txifc.m **clock**

Value(s): external, internal, loop, sfn

Description: Specifies the interface line clock source. To ensure proper communication, the sender and receiver must synchronize their data clocks.

In a NetVX-only network, each NetVX uses internal timing on each transmit interface. When receiving data, a NetVX uses the received clock to extract the payload from the phyiscal layer bitstream. Clock differences of up to ± 20 ppm on the internal clock permit data to be extracted correctly.

Normally, transmit interfaces 'one' (txifc.1) and 'two' (txifc.1) operate independently. Some combinations of the standard and timing affect this independence. Consider tx.1 the dominant interface in these interactions, with its configuration placing constraints on tx.2. The following table describes the constraints.

Table 23-21 TMX TX Interface 'Standard' and 'Clock' Setting Dependencies

'Standard' Setting	Tx.1 'Clock' Setting				Corresponding Tx.2 'Clock' Setting		
	External	Internal	Loop	SFN	External	Internal	Loop
ASI-188					Any setting.		
ASI-204					Any setting.		
ASI-ISDB					'Standard' and 'Clock' settings must match those of TX.1		
ASI-MPH					'Standard' and 'Clock' settings must match those of TX.1		
SMPTE-MPH					'Standard' and 'Clock' settings must match those of TX.1 TX.2 cannot independently send MPH.		
SMPTE-310M					'Standard' and 'Clock' settings must match those of TX.1		
One TX Interface can use: SMPTE-310M While the other uses: ASI-188 or ASI-204							

Supported	
Unsupported	

external The interface uses the reference clock from the system controller.

internal The interface uses an internal clock to drive the transmit data circuitry.

loop The transmit interface uses timing derived from receive interface one, which must be supplied a SMPTE-310M signal. The transmitter locks its clock to the arriving bit stream and clocks its outgoing data to match the rate being received. See below for more details. In this timing model, the configured transmit rate is ignored; the actual transmit rate matches the SMPTE-310M input signal (19.39265846 Mbps). ATSC M/H applications commonly use loop timing.

sfn The transmit interface uses timing derived from receive interface one, which must be supplied with an ASI signal carrying an MPEG transport stream. Receipt of a transport stream packet on the receive interface causes a transport stream packet to be transmitted on the transmit interface. In this timing model, the configured transmit rate is ignored; the actual transmit rate is 32.507936 Mbps. This clock selection is used for ISDB Single-Frequency Networks.

Note 1: Loop timing requires a SMPTE-310M input signal on receive interface one.

Intro/Update: 4.5.0/8.1.0

cfg slot.s/mux/txifc.m **crslrate**

Value(s): 0 to 16,000,000

Description: Specifies the data carousel bitrate for the interface. If the interface's carousel has streaming enabled, this bitrate governs the maximum transport stream bandwidth that will be used by carousel data.

Note: Depending on implementation issues, the module may have an upper bound on the total carousel bandwidth across all its interfaces. A module might be unable to support multiple carousels, each configured to 16 Mbps.

Intro/Update: 4.5.0/4.5.0

cfg slot.s/mux/txifc.m **crslstream**

Value(s): enable, disable

Description: Enables/disables the interface's data carousel streaming.

disable Turns off carousel streaming. Any existing carousel files are ignored, and the interface does not check for new carousel files. Carousel data are not multiplexed into the transport stream.

enable Turns on carousel handling. If a valid carousel file is present, and its activation time has arrived, the file's data will be multiplexed into the interface's transport stream.

Intro/Update: 4.5.0/4.5.0

cfg slot.s/mux/txifc.m **delivsysdesc**

Value(s): enable, disable

Description: Specifies the DVB delivery descriptor for this transport stream.

Note: The encoder's 'simode' (cfg slot.s/mux/mxifc.m simode) setting may affect this parameter.

Intro/Update: 5.5.0/5.5.0

cfg slot.s/mux/txifc.m **emmbasepid**

Value(s): -1, 32–8191

Description: Sets the EMM Base PID value used with Conditional Access.

-1 This is the default value, it assigns the EMM Base PID to 8194.

32-8191 Range of possible EMM PID values.

Intro/Update: 8.1.1/8.1.1

cfg slot.s/mux/txifc.m **invertsync**

Value(s): disable, enable

Description: Enables/disables the sync byte inversion for this interface..

enable Turns off sync inversion. All transport stream sync bytes are transmitted as 0x47.

disable Turns on sync byte inversion for standard {smpte-mph}. The start of each M/H frame uses 0xB8 instead of 0x47. Sync byte inversion is typically enabled for SMPTE M/H, but it can be disabled for downstream equipment that does not support inversion.

Intro/Update: 8.1.0/8.1.0

cfg slot.s/mux/txifc.m **loop**

Value(s): off, external

Description: Specifies the interface loopback mode.

off No loopback.

external The signal entering the receive interface is looped back out the same-numbered transmit interface; e.g. “In 1” to “Out 1”.

Note: When set to “external” stat slot.s/mux/txifc.m standard indicates the standard of the signal entering on the receive input.

Intro/Update: 3.1.0/3.1.0

cfg slot.s/mux/txifc.m **mode**

Value(s): bidirectional, link-1, link-2, link-3, link-4, OFF, txOnly

Description: Specifies the interface communication mode. Conceptually, the mux cards have independent receive and transmit interfaces: tx-1 and tx-2 have no inherent relationship. In practice, however, the receive and transmit interfaces can be paired together. This happens logically when the receive and transmit cables run together to a common destination.

Additionally, TMX-M12 modules share interface hardware between the receiver and transmitter. Setting the transmitter standard, for example, implicitly sets the corresponding receiver's standard as well. These modules support direct-map communication standards that send management information to help monitor network health or diagnose problems. For example, when a direct-map interface detects errors on its input, it normally sends RDI on its output.

bidirectional The TMX-M12 (only) module send and receives signals on the specified interface pair.

link-1 Links the transmit interface multiplexer (1–2 on the TMX-M12, and 1–4 on the TMX-M14) specified in the command line path to physical interface 1.

link-2 Links the transmit interface multiplexer (1–2 on the TMX-M12, and 1–4 on the TMX-M14) specified in the command line path to physical interface 2.

link-3 Links the transmit interface multiplexer (1–2 on the TMX-M12, and 1–4 on the TMX-M14) specified in the command line path to physical interface 3.

link-4 Links the transmit interface multiplexer (1–2 on the TMX-M12, and 1–4 on the TMX-M14) specified in the command line path to physical interface 4.

*OFF ** Deactivates the TX interface but allows VC creation. However VCs remain inactive until the interface is activated.

*txonly** Puts the interface into transmit-only mode. To the extent possible, this value de-couples the transmit and receiver interfaces.

The examples below link all four output interfaces to the output emitted by ‘txifc 2’.

```
cfg slot.7/mux/txifc.1 mode=link-2
cfg slot.7/mux/txifc.2 mode=link-2
cfg slot.7/mux/txifc.3 mode=link-2
cfg slot.7/mux/txifc.4 mode=link-2
```

Hint: the next line would accomplish the same thing, and would save some typing as well!

```
cfg slot.7/mux/txifc.* mode=link-2
```

Note 1: * Availability of this selection is determined by the module’s feature profile.

Note 2: The “link-3” and “link-4” options are only available on the TMX-M14.

Intro/Update: 4.0.0/7.2.0

cfg slot.s/mux/txifc.m **netdeg**

Value(s): enable, disable

Description: Enables/disables the interface's network degrade alarms.

Intro/Update: 3.1.0/3.1.0

cfg slot.s/mux/txifc.m **netflt**

Value(s): enable, disable

Description: Enables/disables the interface's network fault alarms.

Note: Use the cfg sys/alm netFltSev command to set this alarm's severity level.

Intro/Update: 3.1.0/3.1.0

cfg slot.s/mux/txifc.m **networkid**

Value(s): enable, disable

Description: Specifies the DVB network identifier for this stream.

Intro/Update: 3.1.0/5.5.0

cfg slot.s/mux/txifc.m **passthrough**

Value(s): enable, disable

Description: Specifies whether to bypass this interface's multiplexer.

disable The multiplexer interface receives one or more single-program transport stream via cross connections, on VCs. It then multiplexes these streams into a single MPTS directed to the transmit "Out 1" or "Out 2" port.

enable The interface receives one multi-program transport stream as input and makes that stream available as output. It passes the untouched MPTS input to the transmit "Out 1" or "Out 2" port.

Note: Passthrough is disabled if more than one VC is configured to operate on this interface. To re-enable Passthrough, delete all but one VC and enable this control.

Intro/Update: 3.1.0/4/0.0

cfg slot.s/mux/txifc.m **pidmap**

Value(s): automatic, manual

Description: This parameter operates identically to that of the parameter of the same name on the MX Interface. See "cfg slot.s/mux/mxifc.m pidmap" on page 270.

Intro/Update: 6.0.0/6.0.0

cfg slot.s/mux/txifc.m **rate**

Value(s): 0 to 214 Mbps

Description: Sets the output bit rate of the transport stream transmitted from this interface. Specifies the transmit transport stream bitrate for the interface. The rate is limited by the selected standard (cfg slot.s/mux/txifc.m standard) in the following manner.

0 to 213.72 This is the range of rates when the Interface Standard (cfg slot.s/mux/txifc.m standard) is set to either 'ASI-188-CBR' or 'ASI-188-VBR'. When using this standard setting, every 8-bit byte occupies 10 bits on the physical medium. Additionally, packets are separated by 2 padding bytes.

Using this format, the carrier rate (or raw bandwidth) for a given transport stream rate is the following:

carrier_rate = ts_rate * (10/8) * (190/188)

213.7263158 = 270 * (8/10) * (188/190)

0 to 197.12 This is the range of rates when the Interface Standard (cfg slot.s/mux/txifc.m standard) is set to either 'ASI-204-CBR' or 'ASI-204-VBR'. Every 8-bit byte occupies 10 bits on the physical medium. Additionally, packets are separated by 2 padding bytes. Finally, the rate is computed for 188-byte packets, even though 204 bytes of data are present.

Using this format, the carrier rate (or raw bandwidth) for a given transport stream rate is the following:

carrier_rate = ts_rate * (10/8) * (206/204) * (204/188)

197.1262136 = 270 * (8/10) * (204/206) * (188/204)

0 to 19.39 This is the range of rates when the Interface Standard (cfg slot.s/mux/txifc.m standard) is set to 'SMPTE-310m'.

Intro/Update:3.1.0/6.6.0

cfg slot.s/mux/txifc.m **simode**

Value(s): atsc, dvb, isdtv, mpeg, none

Description: Specifies the system information table paradigm.

atsc Generate control tables appropriate for ATSC broadcasters.

dvb Generate control tables for the Digital Video Broadcasting project.

isdtv Generate control tables appropriate for ISDTV (International Standard for Digital Television). In addition to the generic MPEG tables, ISDTV includes the network information table from DVB (NIT), service description table from DVB (SDT), event information table from DVB (EIT), and time offset table (TOT). See ARIB STD-B10, Service Information for Digital Broadcasting System for details.

mpeg Generate generic MPEG control tables.

none Generate no tables. To form a correct MPEG stream, the control tables would need to be inserted by other means.

Intro/Update:3.1.0/7.2.0

cfg slot.s/mux/txifc.m **standard**

Value(s): asi-188-acbr, asi-204-acbr, asi-188-cbr, asi-188-vbr, asi-204-cbr, asi-204-vbr, asi-isdtv, smpte310m

Description: Specifies the mux interface standard.

asi-188-acbr, asi-204-acbr This denotes Asynchronous Serial Interface (ASI), with adaptive, constant bitrate output. A transmitter must be explicitly configured to use 188-byte or 204-byte packets. Given a constant bitrate stream to emit, the interface dynamically adjusts its output clock to maintain the output, without inserting or deleting null packets. It uses the configured output rate as the nominal value for the multiplex, but it allows the actual rate to exceed the configured value by 1% to account for hardware clock differences between systems.

asi-188-cbr, asi-204-cbr This denotes Asynchronous Serial Interface (ASI). A transmitter must be explicitly configured to use either 188-byte, or 204-byte packets – as per this setting. The module reads packets out of their buffer at a constant rate and inserts null transport stream packets to bring the output rate (cfg slot.s/mux/txifc.m rate) of the multiplex up to the required value.

asi-188-vbr, asi-204-vbr

This denotes Asynchronous Serial Interface (ASI). A transmitter must be explicitly configured to use either 188-byte, or 204-byte packets – as per this setting. The module reads packets out of their buffer at the highest rate possible (therefore variable) without exceeding the configured output rate (cfg slot.s/mux/txifc.m rate). No null packets are inserted, so the resulting stream may not consume the entire configured rate.

asi-isdtv This denotes Asynchronous Serial Interface (ASI), carrying ISDTV information. This additionally implies 204-byte packets and constant bitrate transport streams. The module reads packets out of their buffer at a constant rate and inserts null transport stream packets to bring the output rate of the multiplex up to the required value.

smpte310m Runs at a fixed rate of 19.39265846 Mbps with 188-byte packets. The module inserts null packets as required to maintain this constant output rate.

asi-mph This denotes ASI carrying MPH (mobile/pedestrian/handheld) information using 188-byte packets. The interface uses the configured output rate, though 19.392659 Mbps is recommended for an ATSC broadcast (approximating the SMPTE-310 rate of 19.39265846 Mbps). See cfgSlotMuxMxVcMph for MPH parameters that apply to virtual channels.

Only TMX-M12 supports this output standard. Moreover, only the interface 1 logic can emit an MPH stream, though both interfaces can be configured with the value. When MPH is in use, the second transmitter should be linked to interface 1, so the same stream is emitted on both connectors. That is, set txIfc.2/mode=link-1, effectively disabling the logic for interface 2.

smpte-mph This denotes SMPTE-310M carrying MPH (mobile/pedestrian/handheld) information. The module reads packets out of their buffer at a constant rate and inserts null transport stream packets or opportunistic data to bring the output rate of the multiplex up to the SMPTE-310M rate (19.39265846 Mbps with 188-byte packets). See cfgSlotMuxMxVcMph for MPH parameters that apply to virtual channels.

Only TMX-M12 supports this output standard. Moreover, only the interface 1 logic can emit an MPH stream, though both interfaces can be configured with the value. When MPH is in use, the second transmitter should be linked to interface 1, so the same stream is emitted on both connectors. That is, set txIfc.2/mode=link-1, effectively disabling the logic for interface 2.

In all cases, output packets have their PCR adjusted: adjusted_PCR = original_PCR + (system_clock - timestamp)

Intro/Update: 3.1.0/8.0.0

cfg slot.s/mux/txifc.m **tag**

Value(s): Any text string up to 31 characters.
Description: Specifies a name for this mux transmit interface.
Intro/Update: 3.1.0/3.1.0

cfg slot.s/mux/txifc.m **tsid**

Value(s): 0, 1 to 65535
Description: Specifies the transport stream ID for this interface *.
Note: * Availability of this selection is determined by the module's feature profile.
See Table 20-2, "TMX-M12 Module Type Definitions" on page 148. See also util key .
Intro/Update: 3.1.0/4/0.0

23.1.44 TMX Tx Interface Router Configuration Parameters

cfg slot.s/mux/txifc.m/rtr

slot.s s = Slot number.
3–17 SYS-1700's range of application module slot numbers.
2–4 SYS-200/SYS-300's range of application module slot numbers.

txifc.m m = Transmit interface (txifc) number (1–2)
txifc.1 Specifies the TMX module's "Out 1" ASI/310M transmit interface.
txifc.2* Specifies the TMX module's "Out 2" ASI/310M transmit interface.
* Availability of this selection is determined by the module's feature profile.

cfg slot.s/mux/txifc.m/rtr **in**

Value(s): 1–n (n = the number of router inputs)
Description: Specifies the router (input) port receiving its signal directly from the signal source. Example: On a 12x1 router, valid values for this item would range from 1 to 12.
Intro/Update: 3.1.0/3.1.0

cfg slot.s/mux/txifc.m/rtr **lvl**

Value(s): 0 to 15
Description: Specifies the router level to associate with the signal feeding this module. A unique router level is typically assigned to each signal.
Intro/Update: 3.1.0/3.1.0

cfg slot.s/mux/txifc.m/rtr **out**

Value(s): 1–n (n = the number of router outputs)
Description: Specifies the router (output) port connected directly to the specified TMX input interface. Example: On a 12x1 router, "1" is the only valid "out" value.
Intro/Update: 3.1.0/3.1.0

23.1.45 SYS Control Interface Configuration Parameters

cfg sys/ca/system.n

Use these configuration parameters to modify and control conditional access interface settings.

system.nn = Conditional Access System number.

1–4 Range of Conditional Access Systems.

cfg sys/ca/system.n **tag**

Value(s): Any text string up to 31 characters.
Description: Specifies a name for the Conditional Access (CA) system at this system index number.
Intro/Update:8.3.0/8.3.0

cfg sys/ca/system.n **vendor**

Value(s): Irdeto, Conax, User Defined
Description: Use this field to name the vendor of the CS system.
Intro/Update:8.3.0/8.6

cfg sys/ca/system.n **CA_SysID**

Value(s): 0–65535
Description: The system ID of the Conditional Access System.
Intro/Update:8.3.0/8.3.0

cfg sys/ca/system.n **PMT_Descriptor**

Value(s): (Available in a future release)
Description: Currently automatically generated using the cfg sys/ca/system.n CA_SysID .
Intro/Update:8.3.0/8.3.0

cfg sys/ca/system.n **CAT_Descriptor ***|*****

Value(s): (Available in a future release)
Description: Currently automatically generetaed using the cfg sys/ca/system.n CA_SysID .
Intro/Update:8.3.0/8.3.0

cfg sys/ca/system.n/ecmg.m

Use these configuration parameters to modify and control conditional access system interface settings.

system.nn = Conditional Access System number.

1–4 Range of Conditional Access Systems (CAS).

ecmg.m m = Entitlement Control Message Generator (ECMG)

1–16 Range of ECMGs on this Conditional Access System.

cfg sys/ca/system.n/ecmg.m **tag**

Value(s): Any text string up to 31 characters.
Description: Use this optional parameter to specify a name for this ECMG.
Intro/Update:8.3.0/8.3.0

cfg sys/ca/system.n/ecmg.m **subcasid**

Value(s): 0–65535

Description: Sub-conditional access system ID. This value must be unique for each ECMG on each Conditional Access System.

Intro/Update: 8.3.0/8.3.0

cfg sys/ca/system.n/ecmg.m **tsid**

Value(s): 0–65535

Description: Must be unique for each multiplexed transport on NetVx using Simulcrypt controlled program VC. This is the ID of the transport interface where the ECM generated by the ECMG will be played out.

Intro/Update: 8.3.0/8.3.0

cfg sys/ca/system.n/ecmg.m **ipaddr**

Value(s): IP Address

Description: The IP address on CAS of the ECMG.

Intro/Update: 8.3.0/8.3.0

cfg sys/ca/system.n/ecmg.m **port**

Value(s): IP Port

Description: The IP port for the ECMG on CAS

Intro/Update: 8.3.0/8.3.0

cfg sys/ca/system.n/emmg.m

Use these configuration parameters to modify and control conditional access system interface settings.

system.nn = Conditional Access System.

1–4 Range of Conditional Access Systems.

emmg.mm = Entitlement Management Message Generator.

1–16 Range of Entitlement Management Message Generators (EMMGs).

cfg sys/ca/system.n/emmg.m **tag**

Value(s): Any text string up to 31 characters.

Description: Use this optional parameter to specify a name for this EMMG.

Intro/Update: 8.3.0/8.3.0

cfg sys/ca/system.n/emmg.m **tsid**

Value(s): 0–65535

Description: Must be unique for each multiplexed transport on NetVx using Simulcrypt controlled program VC. This is the ID of the transport interface where the EMMs generated by the EMMG will be played out.

Intro/Update: 8.3.0/8.3.0

cfg sys/ca/system.n/emmg.m **rate**

Value(s): 0–2000 kbps.

Description: Use this control to set the maximum bandwidth to be consumed by EMMs on the transport. This bandwidth must be taken into account when allocating rate on programs and other data on the interface.

Intro/Update: 8.3.0/8.3.0

cfg sys/ca/system.n/emmg.m **protocol**

Value(s): tcp, udp

Description: Connections are always TCP but data transfer can be TCP or UDP. This setting must be coordinated with the same setting on the Conditional Access System itself.

Intro/Update: 8.3.0/8.3.0

cfg sys/ca/system.n/emmg.m **ipaddr**

Value(s): IP Address

Description: The IP address of the Conditional Access System that will connect to the TCP port.

Intro/Update: 8.3.0/8.3.0

cfg sys/ca/system.n/emmg.m **tcpport**

Value(s): TCP Port

Description: TCP port to use for the EMMG server if the cfg sys/ca/system.n/emmg.m protocol is set to 'tcp'.

Intro/Update: 8.3.0/8.3.0

cfg sys/ca/system.n/emmg.m **udpport**

Value(s): UDP Port

Description: UDP port to use for the EMMG server if the cfg sys/ca/system.n/emmg.m protocol is set to 'udp'.

Intro/Update: 8.3.0/8.3.0

cfg sys/ca/system.n/ac.m (Available in a future release)

Use these configuration parameters to modify and control conditional access system interface settings.

system.nn = Conditional Access System number.

1–1000 Range of Conditional Access Systems.

cfg sys/ca/system.n/ac.m (Available in a future release) **tag ***|***

Value(s): Any text string up to 31 characters.

Description: ***|***

Intro/Update: 8.3.0/8.3.0

cfg sys/ca/system.n/ac.m (Available in a future release) **value ***|***

Value(s): ***|*** Hex value

Description: ***|***

Intro/Update: 8.3.0/8.3.0

cfg sys/ca/scg.n

Use these configuration parameters to modify and control conditional access system interface settings.

scg.n n = Scrambling Control Group.
1–1023 Range of Scrambling Control Groups.

cfg sys/ca/scg.n **tag**

Value(s): Any text string up to 31 characters.
Description: Optional namne to apply to each Scrambling Control Group (SCG).
Intro/Update:8.3.0/8.3.0

cfg sys/ca/scg.n **tsid**

Value(s): 0–65535
Description: This value must match a TSID on the interface where the VC's referencing the SCG are attached.
Intro/Update:8.3.0/8.3.0

cfg sys/ca/scg.n **cryptoperiod**

Value(s): 0–65535
Description: This is the suggested crypto period. The actual crypto period is negotiated at connection to an ECMG.
Intro/Update:8.3.0/8.3.0

cfg sys/ca/scg.n/ecm.m

Use these configuration parameters to modify and control conditional access system interface settings.

scg.n n = Scrambling Control Group.
1–1023 Range of Scrambling Control Groups.
ecm.m m = Scrambling Control Group number.
1–4*** Range of ECM index numbers.

cfg sys/ca/scg.n/ecm.m **systemindex**

Value(s): 1–4
Description: This is the index of the CAS entry that is associated with the ECM. Use this value to identify the appropriate ECMG to attach ECM.
Intro/Update:8.3.0/8.3.0

cfg sys/ca/scg.n/ecm.m **serviceid**

Value(s): 0–65535
Description: The assigned service ID. This typically is the program number in the transport multiplex.
Intro/Update:8.3.0/8.3.0

cfg sys/ca/scg.n/ecm.m **pid**

Value(s): 0–8190
Description:PID to use for ECM. Must be unique across all PIDs in multiplex.
Intro/Update:8.3.0/8.3.0

cfg sys/ca/scg.n/ecm.m **acindex***|***

Value(s): ***|***
Description: Specifies the IP address of the network time server.
Intro/Update:8.3.0/8.3.0

cfg sys/ctl

Use these configuration parameters to modify and control interface settings.

cfg sys/ctl **ccsp**

Value(s): enable, disable
Description: Enables/disables CCS-P (Leitch Command and Control System Protocol).
Note: CCSP does not support setting the module type. That should be done through another control interface (SNMP, HTTP, craft, telnet). The configured module type is visible through CCSP, but is not configurable.
Intro/Update:7.2.0/8.1.0

cfg sys/ctl **fpd**

Value(s): enable, disable
Description: Use this parameter to enable or disable the NetVX™'s front panel display.
Intro/Update:2.0.0/2.0.0

cfg sys/ctl **ftp**

Value(s): enable, disable
Description: Use this parameter to enable or disable the NetVX™'s FTP interface.
Intro/Update:2.0.0/2.0.0

cfg sys/ctl **http**

Value(s): enable, disable
Description: Use this parameter to enable or disable the NetVX™'s HTTP interface.
Intro/Update:2.0.0/4.0.0

cfg sys/ctl **ntpAddr**

Value(s): IP address
Description: Specifies the IP address of the network time server.
Intro/Update:2.0.0/2.0.0

cfg sys/ctl **rip**

Value(s): enable, disable
Description: Use this parameter to enable or disable Router Information Protocol (RIP) processing at the system level.
Note: The command cfg sys/ctl rip provides global control over RIP and operates in conjunction with cfg slot.s/ip/ifc.m ripstate and (separately) in conjunction with cfg sys/ip/lis.m ripstate.
Intro/Update:4.0.0/4.0.0

cfg sys/ctl **snmp**

Value(s): enable, disable

Description: Use this parameter to enable or disable communication using SNMP. The Vidiem Element Management System uses SNMP for communication with the NetVX™.

Intro/Update: 2.0.0/2.0.0

cfg sys/ctl **telnet**

Value(s): enable, disable

Description: Use this parameter to enable or disable the NetVX™'s telnet interface

Intro/Update: 2.0.0/2.0.0

23.1.46 SYS General Configuration Parameters

cfg sys/gen

Use these configuration parameters to modify general system settings.

cfg sys/gen **cfgtag**

Value(s): Any text string up to 31 characters.

Description: Specifies a name to apply to the NetVX™ 'configuration' when the 'configuration' is saved using the util save command. Each NetVX™ 'configuration' is a snapshot of all current parameter values.

Note: See Section 22.6, "Overview of NetVX™ Tags" on page 159.

Intro/Update: 2.0.0/2.0.0

cfg sys/gen **dstaction**

Value(s): begin, end, none

Description: Specifies the action for the daylight saving time transition. This value and the DST transition date schedule a transition between regular time and daylight saving time. The values help construct MPEG system information tables, such as the ATSC System Time Table (see ATSC A/65).

off No transition is indicated; daylight saving time is not being observed.

on No transition is indicated; daylight saving time is observed.

begin The system will (or did) enter daylight saving time at the configured date and time, depending on whether that date is in the future (or the past).

end The system will (or did) exit daylight saving time at the configured date and time, depending on whether that date is in the future (or the past).

Note 1: The system keeps its internal clock in UTC and does not maintain local time. Nevertheless, the DST transition parameters give a way to construct the appropriate values for the system information tables. The date/time should be given in local time (this is convenient for the operator and the system). An example transition out of DST occurred in the USA on 2003-10-26 02:00:00.

Note 2: If this value is being used to indicate a DST transition (begin or end), the transition date will eventually arrive, trigger the change, and then recede. At that time, the next transition could be configured. To help alert the operator to an obsolete configuration, the system asserts an alarm (System Degrade Configuration Error) when the transition date is more than a couple of months in the past.

Intro/Update: 5.5.0/6.6.0

cfg sys/gen **dstdate**

Value(s): text in the form... YYYY-MM-DD hh:mm:ss

Description: Specifies the date and time for the daylight saving time transition.

Intro/Update: 5.5.0/5.5.0

cfg sys/gen **pwr**

Value(s): 1, 2

Description: Specifies the number of power supplies contained in the chassis. The specified value should match the capabilities of the chassis.

1 Applicable to the SYS-200, the SYS-300, the SYS-350, and the SYS-1700-AC or DC.

2 Applicable to the SYS-1700-AC or DC only.

Intro/Update: 4.0.0/4.0.0

cfg sys/gen **refsource**

Value(s): ext-ntsc, ext-pal, int-ntsc, int-pal

Description: Specifies the reference signal source. Given a composite reference signal (sometimes called “black burst”), decoders and other equipment can lock their picture generation to the reference input. By synchronizing equipment to the same signal, a studio enables frame-accurate operations and avoids glitches in the broadcast signal.

ext-ntsc The system uses an external signal, expected to be the NTSC frame rate of 29.97 frame/sec.

ext-pal The system uses an external signal, expected to be the PAL frame rate of 25 frame/sec.

int-ntsc The system uses an internal signal for the NTSC frame rate of 29.97 frame/sec.

int-pal The system uses an internal signal for the PAL frame rate of 25 frame/sec.

Note: The SYS-A22 provides a reference signal input. Therefore, the two external settings are only available when the SYS-A22 module is used as the system controller.

Intro/Update: 6.5.0/6.5.0

cfg sys/gen **tag**

Value(s): Any text string up to 31 characters.

Description: A textual name to identify this NetVX™ system on the network.

Note: See Section 22.6, "Overview of NetVX™ Tags" on page 159.

Intro/Update: 2.0.0/2.0.0

cfg sys/gen **utcoffset**

Value(s): <number of seconds for offset>

Description: Specifies the current GPS/UTC offset in seconds.

Global Positioning System (GPS) clocks derive their value from atomic timekeepers, without adjustment for the gradual slowing of the earth's rotation. On the other hand, UTC clocks are adjusted occasionally, using leap seconds to keep the “wall clock time” coordinated with the earth's rotation and revolution around the sun. This value should be set to the current difference between the GPS and UTC clocks.

UTC = GPS – utcoffset

The US Navy's Time Service Department maintains the official time standard for the US and posts updates when leap seconds are inserted.

http://tycho.usno.navy.mil/

http://hpiers.obspm.fr/iers/bul/bulc/bulletinc.dat

Intro/Update: 5.5.0/5.5.0

cfg sys/gen **protaddr**

Value(s): dual-mac, single-mac

Description: Specifies the address handling during protection failover/failback. When equipped with an appropriate secondary system controller, a NetVX™ supports 1-for-1 redundancy on the primary controller module. To simplify external communication, the system presents one IP address for control, regardless of which system controller is active. If the primary system controller (in slot 1) fails, the backup controller (in slot 2) takes over operation of the system. As part of the transfer, the backup controller assumes “ownership” of the system's IP address.

- From an external perspective, the NetVX™ IP address remains the same, although the address moves from one physical interface to another.
- Connection-oriented services (such as those using TCP/IP) will drop during a failover, because the backup controller does not mirror the internal state of the primary.
- Connection-less communications (UDP, SNMP, etc.) normally continue to operate. (Some packets may get lost, if they happen to be sent during the period of the address transfer.)

When the backup controller in slot 2 takes over for the failed controller in slot 1, the system copies configuration for slot 1 to slot 2 (See the "stat slot.s/gen failSlot" command on page 359). When the system restores service to slot 1, either through a reboot or a failback operation, the normal slot configuration is restored.

This parameter's value controls a second behavior during protection actions (either failover or failback).

dual-mac Use this option to let the primary and the backup modules each retain their unique MAC addresses during failover and failback operations. The modules share a single IP address, but they do not swap MAC addresses. Therefore when this option is used and the NetVX™ performs a failover from one system controller to another, external equipment will interact with one MAC address before failover and a second MAC address (associated with the backup system controller) after failover.

Some networking equipment have port security policies that try to detect “spoofing.” Such equipment disables communication with the device once it detects the “movement” of a known MAC address from one physical port to another. When the NetVX™ system controller is connected to a device that has this feature enabled, the ‘dual-mac’ address handling should be used.

single-mac Use this option to let the primary and the backup modules move BOTH their IP and MAC addresses during failover and failback.

Many IP routers keep tables with pairs of IP and MAC addresses, using these values to route packets more quickly. Preserving the MAC address avoids ARP cache issues on external equipment, thus making failover and failback nearly transparent.

Note: This value currently applies only to system controllers and not to peripheral modules (such as GBE-C11).

Intro/Update: 7.2.0/7.2.0

23.1.47 SYS General Purpose Input Configuration Parameters

cfg sys/gpi.m

gpi.m m = GPI number (2–4) as numbered on the GPI interface at the rear of the system.

Use these configuration parameters to modify General Purpose Input (GPI) settings and behavior.

cfg sys/gpi.m **cfg**

Value(s): 0, 1–99

Description: Specifies a numbered configuration for this GPI. Setting a GPI's 'function' to 'cfg' (see cfg sys/gpi.m function below) programs it to load a configuration file when the GPI triggers. This parameter specifies the configuration to be loaded.

Intro/Update: 5.6.0/5.6.0

cfg sys/gpi.m **function**

Value(s): alm-close, alm-open, cfg, splice, none

Description: Specifies this GPI's assigned function. The GPIs can be modeled as contact switch leads that are opened or closed, thus making or breaking electrical connectivity. The system senses the condition of the GPI contact and triggers actions based on the configured function.

alm-close This value associates a GPI with an alarm (sysDeg, GPI Contact Change). When the GPI transitions from open to closed, the system asserts the alarm. When the GPI transitions from closed to open, the system negates the alarm.

alm-open This value associates a GPI with an alarm (sysDeg, GPI Contact Change). When the GPI transitions from closed to open, the system asserts the alarm. When the GPI transitions from open to closed, the system negates the alarm.

cfg This value associates a GPI with a given stored configuration (see cfg sys/gpi.m cfg above). If the GPI transitions from open to closed, the system loads the designated configuration. If that configuration does not exist or some other error occurs, the system momentarily asserts an alarm (sysDeg, Configuration Error). Because the GPI trigger is an event and not a persistent condition, the system lets the alarm expire after a few seconds.

splice This value lets encoders receive notification when the GPI changes state. It can be used to trigger splice point insertion.

none This value explicitly associates no action with a GPI. The system senses the contact and makes that available in the status, but a change in the contact state does not trigger additional activity.

Intro/Update: 5.6.0/7.0.0

23.1.48 SYS General Purpose Output Configuration Parameters

cfg sys/gpo.m

gpo.m m = GPO number (2–4) as numbered on the GPO interface at the rear of the system.

Use these configuration parameters to modify General Purpose Output (GPO) settings and behavior.

cfg sys/gpo.m **function**

Value(s): open, closed, criticalAlm, majorAlm, minorAlm, warningAlm, backup-2…backup-17, svralm

Description: Sets the functional behavior of the specified GPO.

open Opens the GPO, breaking electrical connectivity between the two GPO leads.

closed Closes the GPO, completing electrical connectivity between the two GPO leads.

xc-failover This value associates a GPO with a cross-connection failover. If any entry in the cross connection table goes through an automatic service protection action, the GPO closes and stays closed for five seconds. If several failovers occur in overlapping sequence, the GPO opens five seconds after the last failover occurs. This function applies only to automatic failovers, and not to manually initiated failovers.

criticalalm Closes the specified GPO during any instance of a critical alarm.

majoralm Closes the specified GPO during any instance of a major alarm.

minoralm Closes the specified GPO during any instance of a minor alarm.

warningalm Closes the specified GPO during any instance of a warning alarm.

backup2…backup17 Associates the GPO with a protection module in the specified slot. The GPO closes if a failover activates the specified module.

- The module in the indicated slot is not involved in a protection chain; it neither has a configured backup module nor is itself configured as a backup for other modules.
- The module fails in a way that would cause a “theoretical” failover. That is, a failover would have occurred, except the module has no configured protection.
- This theoretical failover closes the GPO.
- The GPO stays closed as long as the fault condition persists. If the indicated module comes back into active service, the GPO opens.

srvalm Use this option to configure the system to close the specified GPO relay when a ‘Service Degrade’ or a ‘Service Fault’ alarm condition occurs on either a specific cross connection or on any cross connection. The GPO stays closed as long as such an alarm is asserted. The association of this function with either one particular cross connection, or any cross connection is specified using the cfg sys/gpo.m srvxc command.

Note: ‘Service Event’ alarms do not affect the GPO.

This control serves two functions.

(1) Use this control to trigger the GPO to close when the specified ‘Backup’ module takes over for a main module.

Use the drop down list to select the slot number of the backup module responsible for this trigger.

(2) Use this control to trigger the GPO to close when the specified ‘Main’ module either:

- Experiences a ‘Protection Fault’ or…
- Experiences a state whereby it Is ‘Enabled’, but not ‘In Service’.

Intro/Update: 2.0.0/7.8.0

cfg sys/gpo.m **srvxc**

Value(s): 0, 1 to 1024

Description: Specifies the service cross connection index for this GPO. When the GPO cfg sys/gpo.m function set to "srvAlm", this parameter specifies whether 'all' (0) or only one (0 to 1024) cross connection scope for service alarms.

0 The function applies to all cross connection entries; the GPO will activate when a condition service alarm is asserted for any cross connection.

0, 1 to 1024 When non-zero, the function applies only to the specific indicated entry. Service alarms for other cross connections will not trigger the GPO.

Note: If this behavior is not desired for a given GPO, simply ensure the cfg sys/gpo.m function is set to a value other than "srvAlm".

Intro/Update: 7.8.0/7.8.0

23.1.49 SYS Controller Ethernet Configuration Parameters

cfg sys/ip/eth

Use these configuration parameters to modify the NetVX™'s IP communication settings.

cfg sys/ip/eth **dhcp**

Value(s): enable, disable

Description: Enables/disables the ability of this interface to act as a DHCP relay agent as defined in IETF RFC 3046 (ftp://ftp.rfc-editor.org/in-notes/rfc3046.txt).

Note: This parameter is functionally equivalent to cfg slot.s/ip/ifc.m dhcp.

Intro/Update: (Available in a future release)

cfg sys/ip/eth **ipaddr**

Value(s): IP address

Description: If non-zero, this gives the IP address for this NetVX™'s Ethernet control interface.

Note: This parameter is functionally equivalent to cfg slot.s/ip/ifc.m ipaddr.

Intro/Update: 2.0.0/2.0.0

cfg sys/ip/eth **ipgate**

Value(s): IP address

Description: Sets the system's IP gateway address.

Intro/Update: 2.0.0/2.0.0

cfg sys/ip/eth **ipmask**

Value(s): IP address

Description: Sets the system's IP subnet mask.

Note: This parameter is functionally equivalent to cfg slot.s/ip/ifc.m ipmask.

Intro/Update: 2.0.0/2.0.0

cfg sys/ip/eth **ripstate**

Value(s): enable, disable

Description: Enables or disables Routing Information Protocol (RIP) for this interface.

Note 1: The commands cfg sys/ip/eth ripstate and cfg slot.s/ip/ifc.m ripstate are functionally equivalent.

Note 2: The command cfg sys/ctl rip provides global control over RIP and operates in conjunction with cfg slot.s/ip/ifc.m ripstateand (separately) in conjunction with cfg sys/ip/lis.m ripstate.

Intro/Update: 4.0.0/4.0.0

23.1.50 SYS Logical IP Subnet Configuration Parameters

cfg sys/ip/lis.m

lis.m m = Index for the Logical IP Subnet (LIS) table entry number (1-63).

Use these configuration parameters to modify the NetVX™'s IP communication settings for each subnet to which it is connected.

cfg sys/ip/lis.m **ipaddr**

Value(s): IP address

Description: Specifies the IP address identifying this system on the selected Logical IP Subnet (LIS).

Intro/Update: 2.2.0/3.3.0

cfg sys/ip/lis.m **ipmask**

Value(s): IP address

Description: Specifies the subnet mask used to reach this system.

Intro/Update: 2.2.0/3.3.0

cfg sys/ip/lis.m **networktype**

Value(s): IP address

Description: Specifies the structure of the specified IP subnet.

mesh The ATM network forms a mesh. Each NetVX™ has a bi-directional network link.

uniring (Available in a future release)
The general physical topology is a ring, but each system communicates in only one direction.

Intro/Update: 2.2.0/5.6.0

cfg sys/ip/lis.m **ripstate**

Value(s): enable, disable

Description: Enables or disables Routing Information Protocol (RIP) for this interface.

Note: The command cfg sys/ctl rip provides global control over RIP and operates in conjunction with cfg slot.s/ip/ifc.m ripstate and (separately) in conjunction with cfg sys/ip/lis.m ripstate.

Intro/Update: 4.0.0/4.0.0

cfg sys/ip/lis.m **tag**

Value(s): Any text string up to 31 characters.

Description: A textual name to associate with this LIS.

Note: See Section 22.6, "Overview of NetVX™ Tags" on page 159.

Intro/Update: 2.2.0/3.3.0

23.1.51 SYS Program PID Settings

cfg sys/pgm

Use these configuration parameters to specify program Base PIDs. "cfg slot.s/mux/mxifc.m pidmap" on page 270

cfg sys/pgm **audpid**

Value(s): 16 to 8190; 51 = Default

Description: Specifies the initial (or 'base') packet identifier (PID) value to apply to packets carrying audio. If the program has multiple audio streams, subsequent PID values are assigned consecutively.

Intro/Update: 6.0.0/6.0.0

cfg sys/pgm **datapid**

Value(s): 16 to 8190; 59 = Default

Description: Specifies the initial (or 'base') packet identifier (PID) value to apply to packets carrying data. If the program has multiple data streams, subsequent PIDs are assigned. Data services such as VBI, teletext, and ancillary data might appear to come and go in the input signal to an encoder. Encoders may used a fixed offset from this base data PID, giving data services fixed PIDs in the transport stream.

Intro/Update: 6.0.0/6.0.0

cfg sys/pgm **ecmpid**

Value(s): 16 to 8190; 62 = Default

Description: Specifies the initial (or 'base') packet identifier (PID) value to apply to packets carrying the stream's ECM (Entitlement Control Message) data. If the program has multiple ECM streams, subsequent PIDs are assigned consecutively.

Intro/Update: 6.0.0/6.0.0

cfg sys/pgm **pcrpid**

Value(s): 16 to 8190; 50 = Default

Description: Specifies the packet identifier to apply to packets carrying PCRs.
An encoder can use or ignore this parameter. If the encoder has been configured to transmit PCRs on the Video PID (combined), it ignores the pcrPid value. Alternatively, the encoder can generate PCRs on a distinct PID (separate), and this pcrPid value gives that packet identifier. Either way, the system's PCR PID value should be distinct from the system's Video PID (vidPid).
When de-multiplexing transport streams, this parameter's value is used as necessary. The demultiplexer examines the incoming program to see if the PCR PID noted in the PMT matches a value in the PMT's stream table. If so, the demultiplexer automatically remaps the PCR PID value in the PMT to match the referenced stream (audio, video, etc.), and this pcrPid parameter is ignored. If the incoming PMT's PCR packet identifier does not match a stream in the PMT loop, this parameter's value gives the packet identifier for the outgoing program's remapped PCR PID. Finally, if the incoming program has no PCRs (indicated with a PCR PID value of 8191 in the PMT), the demultiplexer preserves 8191 in the outgoing program's PMT.

Intro/Update: 6.0.0/6.0.0

cfg sys/pgm **pmtpid**

Value(s): 16 to 8190; 48 = Default

Description: Specifies the packet identifier to apply to packets carrying the PMT.

Intro/Update: 6.0.0/6.0.0

cfg sys/pgm **vidpid**

Value(s): 16 to 8190; 49 = Default

Description: Specifies the packet identifier to apply to packets carrying video.

Intro/Update: 6.0.0/6.0.0

23.1.52 SYS Serial Port Configuration Parameters

cfg sys/ser.m

ser.m m = Serial port number (1–2) as numbered on the rear of the system.
1 Auxiliary port (Aux Port) 1
2 Auxiliary port (Aux Port) 2

Use these configuration parameters to modify the system's serial port settings.

cfg sys/ser.m **baud**

Value(s): 9.6, 19.2, 38.4
Description: Sets the baud rate of the specified serial port.
Intro/Update: 2.2.0/3.3.0

cfg sys/ser.m **function**

Value(s): rtr-Leitch, telnet, udp
Description: Specifies the functional behavior of this serial port.

automation (Available in a future release).
Serial port communications using the NetVX™'s automation control protocol.

rtr-GVG-native (Available in a future release)
The serial port carries router control commands using the Grass Valley Group's "Native Protocol" [Routing Products Protocol Manual, document 071020102, July 2001, Grass Valley Group].

rtr-leitch Serial port communications use Leitch's router control protocol.

rtr-Miranda (Available in a future release)
The serial port carries router control commands using the Miranda protocol, as documented in Network Control System by Network Electronics AS for the Network VikinX routers.

telnet Use this function to connect to a serial port via a telnet session. When a normal telnet client connects to port 23, and the system gives that session a command interpreter. When a telnet client connects to port 300+index, the system gives that session read/write access to serial port index. Characters received from the telnet session are written to the serial port; characters received from the serial port are written to the telnet session.

udp Use this function to provide read/write access to the serial port via UDP. Characters received from the serial port are transmitted to the configured IP address and UDP port. Similarly, characters received on UDP port 300+index are written to serial port index. The system accepts all UDP characters, regardless of the sender's IP address. The serial port's IP address applies to characters being transmitted to the network, not received from the network.

Intro/Update: 2.2.0/5.6.0

Example 24: Serial Port Provisioning

The following line sets the baud rate for COM1 to 19200, and the mode of operation to "rtr-leitch".

```
cfg sys/ser.1 baud=19.2 function=rtr-leitch
```

23.1.53 SYS Trap Receiver Configuration Parameters

cfg sys/trap.m

trap.m m = Index number of entries in the list of trap destinations (1-10).

Use these configuration parameters to modify the system's trap destination settings.

cfg sys/trap.m **ipaddr**

Value(s): IP address

Description: Sets a trap receiver IP address.

0.0.0.0 Use this setting to clear/reset an entry.

Intro/Update: 2.0.0/2.0.0

cfg sys/trap.m **minsev**

Value(s): disable, warning, minor, major, critical

Description: Use this command to specify the minimum alarm severity level that should trigger a trap to be sent to the specified trap monitoring location. Alarms lower than the specified level will not trigger traps to be sent.

Intro/Update: 2.0.0/2.0.0

cfg sys/trap.m **tag**

Value(s): Any text string up to 31 characters.

Description: A textual name to associate with this trap monitoring location.

Note: See Section 22.6, "Overview of NetVX™ Tags" on page 159.

Intro/Update: 2.0.0/2.0.0

Example 25: Trap IP Address Provisioning

Use the following to create an entry in the trap receiver table.

```
cfg sys/trap.4 ipAddr=123.223.323.423 minSev=major tag="Montreal"
```

This command sets the IP address of the trap monitor, specifies this monitor as the fourth trap monitoring location in the list. This location receives notice of every trap with a severity of major and above. The optional text tag is arbitrarily set to "Montreal" as a reminder of the trap monitoring location.

Once an IP address has been entered, reference it by index number when changing configuration parameters. This command would change both the text tag and severity of the preset item.

```
cfg sys/trap.4 minSev=minor tag="West Montreal"
```

23.1.54 SYS Cross Connection Configuration Parameters

cfg sys/xc.m

xc.m Cross Connection number (new, 1-1024)

new Creates a new cross connection using an internally selected index number.

1-1024 The full range of cross connections.

Use these configuration parameters to modify cross connection settings.

cfg sys/xc.m **dchan**

Value(s): 0, 1, 2 (module-dependent)

Description: This command is used in conjunction with cfg sys/xc.m dslot (above) to specify the slot and channel that receives the signal carried by the cross connection.

0 Unassigned.

1 Specifies channel 1 as the cross connection destination.

2 Specifies channel 2 as the cross connection destination.

Intro/Update: 2.0.0/2.0.0

cfg sys/xc.m **dslot**

Value(s): 0, 1 to 17

Description: This command is used in conjunction with cfg sys/xc.m dchan (above) to specify the slot and channel that receives the signal carried by the cross connection.

0 Unassigned.

3–17 Specifies the cross connection destination slot number.

Intro/Update: 2.0.0/2.0.0

cfg sys/xc.m **rowstate**

Value(s): active, backup, create, destroy, inactive

Description: This parameter manages and indicates the state of one or more cross connections (XCs).

active The entry is allocated and enabled for service. As described above, the system checks various rules before activating an entry.

backup Configures this entry for a backup role, as Redundancy describes above. Its corresponding primary entry will have an active state and matching destination slot and destination channel values. No more than one backup entry should exist for a given primary connection. A connection in the backup state is considered to be in service, although it carries no traffic. If the corresponding primary connection fails, the backup's state changes to active, and the backup starts carrying traffic.

create To create a new entry in the table, a manager selects the next available index and tries to set that row's state to create. If the index is valid and that row is not allocated in the table, the system creates a new row at the specified index. After creating a new row in the table, the system sets its state to “inactive”.

destroy Setting a row's state to this value eliminates the row from the table. Any row can be destroyed, regardless of its current state or whether it actually exists.

inactive The entry is allocated but not currently carrying a service.

Note: After a row exists in the table, a manager can set the state to active, backup, or inactive, controlling the associated service. Moreover, an entry's routing parameters (source slot/channel and destination slot/channel) cannot be modified while a row is in service. To change those values, the row state must be inactive.

Intro/Update: 2.0.0/6.5.0

cfg sys/xc.m **XcResMin**

cfg sys/xc.m **XcResMax**

Value(s): 0 to 255

Description: These values jointly specify a reserved range of corss connecton table indexes. When allocating new table entries, an element manager should select entries outside the reserved range. No explicit mechanism designates the "owner" of a reserved range; applications are assumed to understand their roles in the reservation scheme. The value zero indicates no reserved minimum or maximum.

Intro/Update: 8.0.0/8.0.0

cfg sys/xc.m **role**

Value(s): primary, revertive, secondary ('primary' is the default for all cross connections)

Description: Specifies the cross connection's role in providing service and service protection.

primary A cross connection in this role carries the service when the cross connection source is operating as intended.

Alarming – The system issues a 'Service Degrade: Protection Switch' event when a service is switched between two primary cross connections. Note: This type of switch is distinct from a 'failover' which is described in the two cases below.

revertive A cross connection in this role carries the service only when the source of the 'primary' cross connection has failed.

In the event that the 'primary' cross connection's source fails, the system transitions to this cross connection by making its rowstate (cfg sys/xc.m rowstate) 'active' and the 'primary' cross connection's rowstate 'inactive'.

A cross connection in this role automatically fails back to the 'primary' cross connection when the primary's source is restored and it's rowstate again becomes 'active'.

Alarming – The system raises a 'Service Degrade: Primary Failover' during the entire period in which the 'Secondary' cross connection is active.

secondary A cross connection in this role carries the service only when the source of the 'primary' cross connection has failed.

In the event that the 'primary' cross connection's source fails, the system transitions to this cross connection by making its rowstate (cfg sys/xc.m rowstate) 'active' and the 'primary' cross connection's rowstate 'inactive'.

Unlike the 'revertive' role (described above), a cross connection in this role does not automatically failback to the 'primary' cross connection when it's source is restored and it's rowstate again becomes 'active', instead failback must be manually initiated.

Alarming – The system raises a 'Service Degrade: Primary Failover' during the entire period in which the 'Secondary' cross connection is active.

Intro/Update: 7.5.0/7.5.0

cfg sys/xc.m **schan**

Value(s): 0, 1, 2 (module-dependent)

Description: This command is used in conjunction with cfg sys/xc.m sslot (below) to specify the slot and channel to provide the signal carried by the cross connection.

0 Unassigned.

1 Specifies channel 1 as the cross connection source.

2 Specifies channel 2 as the cross connection destination.

Intro/Update: 2.0.0/2.0.0

cfg sys/xc.m **sslot**

Value(s): 0, 3–17

Description: This command is used in conjunction with cfg sys/xc.m schan (above) to specify the slot and channel to provide the signal carried by the cross connection.

0 Unassigned.

3–17 Specifies the cross connection destination slot number.

Intro/Update: 2.0.0/2.0.0

cfg sys/xc.m **tag**

Value(s): Any text string up to 31 characters.

Description: A textual name for this row. The user can set this value to describe the entry.

Note: See Section 22.6, "Overview of NetVX™ Tags" on page 159.

Intro/Update: 2.0.0/2.0.0

Example 26: Cross Connection Provisioning

If there were an encoder in slot 10 and a decoder in slot 8, then the following command would create a cross connection linking these two modules.

```
cfg sys/xc.10 sslot=10 schan=1 dslot=8 dchan=1 rowState=active
```

The output of the encoder would serve as the input to the decoder.

The channel does not need to be specified when there is only one channel in the module. The encoder and the decoder module each have only a single channel so the channel index may be omitted. Therefore, the command could be simplified to the following.

```
cfg sys/xc.10 sslot=10 dslot=8 rowState=active
```

23.2 Alarm Configuration Parameters and Trap Descriptions

23.2.1 Overview of Alarm Categories

There are two categories of NetVX™ alarms.

Degrade Alarms A degrade alarm indicates a problem causing service to degrade but not a loss of service.

Fault Alarms A fault alarm indicates a problem causing a loss of service.

23.2.2 Overview of Alarm Severity Levels

NetVX™ are assigned one of five severity levels. These severity levels can be changed at any time.

'Ignore' Severity Assign 'Ignore' to disable an alarm.

'Warning' Severity Assign 'Warning' to alarm conditions that warrant attention, but do not affect the operation of the system.
Example: An interface that experiences sporadic, correctable errors.

'Minor' Severity Assign 'Minor to relatively unimportant alarm conditions that may or may not affect the overall operation of the system.

'Major' Severity Assign 'Major' to important alarm conditions that affect the output of the system.
Example: Complete loss of video input to an encoder.

'Critical' Severity Assign 'Critical' to alarm conditions that affect the NetVX™ and have the potential to affect other systems as well.
Example: Any of the system's fault alarms.

23.2.3 SYS Alarm Configuration Parameters

cfg sys/alm

Use these configuration parameters to modify severity settings for various groups of degrade and fault alarms.
See Chapter 25 "NetVX™ Trap Descriptions" on page 425 for details about alarms in each group.

cfg sys/alm **audDegDelay**

Value(s): -1, 0, 1 to 120

Description: Specifies the audio degrade alarm delay for service protection. When this alarm type contributes to a service alarm, the configured delay determines when (or if) the system triggers service protection.

-1 This value disables service protection for this alarm type.

0 This value causes service protection to be triggered immediately when this alarm type occurs.

1 to 120 This range of values adds a delay between the occurrence of this alarm type and the service protection failover. This alarm must persist for the configured delay to trigger the service protection. If the alarm clears before the delay time expires, the service continues without protective action.

Intro/Update: 7.5.0/7.5.0

cfg sys/alm **audDegSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level for the following Audio Degrade traps and alarms.

"Audio Degrade - Channel Not Present" described on page 426
"Audio Degrade - CRC Error" described on page 426
"Audio Degrade - Format Not Supported" described on page 426
"Audio Degrade - Configuration Error" described on page 427

Note: Use the cfg slot.s/enc.m/aud.n auddeg command to enable or disable these alarms.

Intro/Update: 2.0.0/2.0.0

cfg sys/alm **audFltDelay**

Value(s): -1, 0, 1 to 120

Description: Specifies the audio fault alarm delay for service protection. When this alarm type contributes to a service alarm, the configured delay determines when (or if) the system triggers service protection.

-1 This value disables service protection for this alarm type.

0 This value causes service protection to be triggered immediately when this alarm type occurs.

1 to 120 This range of values adds a delay between the occurrence of this alarm type and the service protection failover. This alarm must persist for the configured delay to trigger the service protection. If the alarm clears before the delay time expires, the service continues without protective action.

Intro/Update: 7.5.0/7.5.0

cfg sys/alm **audFltSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level applied to the following Audio Fault trap and alarm.

"Audio Fault - Loss of Audio" described on page 427

Note: Use the cfg slot.s/enc.m/aud.n audflt command to enable or disable this alarm.

Intro/Update: 2.0.0/2.0.0

cfg sys/alm **decDegSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level applied to the following Decoder Degrade traps and alarms.

"MPEG Decoder Degrade - Audio Decode Errors" described on page 428
"MPEG Decoder Degrade - Errors In Transport Stream" described on page 428
"MPEG Decoder Degrade - No Audio" described on page 428
"MPEG Decoder Degrade - No Program" described on page 429
"MPEG Decoder Degrade - No Stream" described on page 429
"MPEG Decoder Degrade - No Video" described on page 429
"MPEG Decoder Degrade - Video Decode Errors" described on page 430

Note: Use the cfg slot.s/dec.m/pgm decDeg command to enable or disable this alarm.

Intro/Update: 2.0.0/2.0.0

cfg sys/alm **modDegDelay**

Value(s): -1, 0, 1 to 120

Description: Specifies the module degrade alarm delay for service protection. When this alarm type contributes to a service alarm, the configured delay determines when (or if) the system triggers service protection.

-1 This value disables service protection for this alarm type.

0 This value causes service protection to be triggered immediately when this alarm type occurs.

1 to 120 This range of values adds a delay between the occurrence of this alarm type and the service protection failover. This alarm must persist for the configured delay to trigger the service protection. If the alarm clears before the delay time expires, the service continues without protective action.

Intro/Update: 7.5.0/7.5.0

cfg sys/alm **modDegSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level applied to Module Degrade traps and alarms.

"Module Degrade - Configuration Error" described on page 431
"Module Degrade - General Degrade" described on page 431
"Module Degrade - Module Inserted" described on page 432
"Module Degrade - Module Removed" described on page 432
"Module Degrade - Module Wrong Type" described on page 432
"Module Degrade - Protection Failback Event" described on page 432
"Module Degrade - Protection Failover Event" described on page 433

Note: Use the cfg slot.s/atm/ifc.m netDeg command to enable or disable these alarms.

Intro/Update: 2.0.0/2.0.0

cfg sys/alm **modFltDelay**

Value(s): -1, 0, 1 to 120

Description: Specifies the module fault delay for service protection. When this alarm type contributes to a service alarm, the configured delay determines when (or if) the system triggers service protection.

-1 This value disables service protection for this alarm type.

0 This value causes service protection to be triggered immediately when this alarm type occurs.

1 to 120 This range of values adds a delay between the occurrence of this alarm type and the service protection failover. This alarm must persist for the configured delay to trigger the service protection. If the alarm clears before the delay time expires, the service continues without protective action.

Intro/Update: 7.5.0/7.5.0

cfg sys/alm **modFltSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level applied to the following Module Fault traps and alarms.

"Module Fault - General Fault" described on page 434
"Module Fault - Module Not Present" described on page 434
"Module Fault - Software Fault" described on page 434

Intro/Update: 2.0.0/2.0.0

cfg sys/alm **netDegDelay**

Value(s): -1, 0, 1 to 120

Description: Specifies the network degrade alarm delay for service protection. When this alarm type contributes to a service alarm, the configured delay determines when (or if) the system triggers service protection.

-1 This value disables service protection for this alarm type.

0 This value causes service protection to be triggered immediately when this alarm type occurs.

1 to 120 This range of values adds a delay between the occurrence of this alarm type and the service protection failover. This alarm must persist for the configured delay to trigger the service protection. If the alarm clears before the delay time expires, the service continues without protective action.

Intro/Update: 7.5.0/7.5.0

cfg sys/alm **netDegSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level applied to the following Network Degrade traps and alarms.

"Network Degrade - Configuration Error" described on page 435
"Network Degrade - Errors in Input Signal" described on page 436
"Network Degrade - Transmit Buffer Overflow" described on page 437

Note: Use the following commands to enable or disable these alarms.

cfg slot.s/atm/ifc.m netDeg
cfg slot.s/ip/ifc.m netdeg
cfg slot.s/mux/dxifc.m netdeg
cfg slot.s/mux/rxifc.m netdeg
cfg slot.s/mux/mxifc.m netdeg

Intro/Update: 2.0.0/2.0.0

cfg sys/alm **netFltDelay**

Value(s): -1, 0, 1 to 120

Description: Specifies the network fault alarm delay for service protection. When this alarm type contributes to a service alarm, the configured delay determines when (or if) the system triggers service protection.

-1 This value disables service protection for this alarm type.

0 This value causes service protection to be triggered immediately when this alarm type occurs.

1 to 120 This range of values adds a delay between the occurrence of this alarm type and the service protection failover. This alarm must persist for the configured delay to trigger the service protection. If the alarm clears before the delay time expires, the service continues without protective action.

Intro/Update: 7.5.0/7.5.0

cfg sys/alm **netFltSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level applied to the following Network Fault traps and alarms.

"Network Fault - Loss of Input Signal" described on page 437

"Network Fault - Transport Stream Errors" described on page 438

Note: Use the following commands to enable or disable this alarm for the respective network interface.

cfg slot.s/atm/ifc.m netFlt

cfg slot.s/ip/ifc.m netflt

cfg slot.s/mux/dxifc.m netflt

cfg slot.s/mux/rxifc.m netflt

cfg slot.s/mux/txifc.m netflt

Intro/Update: 1.0.0/1.0.0

cfg sys/alm **srvDegSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level applied to the following Service Degrade traps and alarms.

"Service Degrade - Errors in Service" described on page 438

"Service Degrade - Protection Failover Event" described on page 439

Note: Use the following command to enable or disable this trap and alarm.

cfg slot.s/atm/ifc.m netFlt

Intro/Update: 2.0.0/2.0.0

cfg sys/alm **srvFltSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level applied to the following Service Fault trap and alarm.

"Service Fault - Loss of Service" described on page 439

Intro/Update: 2.0.0/2.0.0

cfg sys/alm **sysDegSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level applied to the following System Degrade traps and alarms.

"Service Degrade - Protection Failover Event" described on page 439

"System Degrade - Configuration Error" described on page 440

"System Degrade - Fan Failure" described on page 441

"System Degrade - Front Panel Failure" described on page 441

"System Degrade - General Purpose Input Raise" described on page 441

"System Degrade - Over Temperature" described on page 441

"System Degrade - Power Supply Failure" described on page 442

"System Degrade - Relay Failure" described on page 442

"System Degrade - Serial Port Error" described on page 442

Intro/Update: 2.0.0/7.5.0

cfg sys/alm **sysFltSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level applied to the following System Fault traps and alarms.

"System Fault - Loss of 3.3V Supply" described on page 444
"System Fault - Loss of 5V Supply" described on page 444
"System Fault - Loss of +12V Supply" described on page 444
"System Fault - Loss of -12V Supply" described on page 444

Intro/Update: 2.0.0/2.0.0

cfg sys/alm **vancDegDelay**

Value(s): -1, 0, 1 to 120

Description: Specifies the VANC degrade alarm delay for service protection. When this alarm type contributes to a service alarm, the configured delay determines when (or if) the system triggers service protection.

-1 This value disables service protection for this alarm type.

0 This value causes service protection to be triggered immediately when this alarm type occurs.

1 to 120 This range of values adds a delay between the occurrence of this alarm type and the service protection failover. This alarm must persist for the configured delay to trigger the service protection. If the alarm clears before the delay time expires, the service continues without protective action.

Intro/Update: 7.5.0/7.5.0

cfg sys/alm **vancDegSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level applied to the Vertical Ancillary Data (VANC) Degrade trap and alarm.

"VANC Degrade - VANC Error" described on page 445

Note: Use the cfg slot.s/enc.m/vanc vancdeg command to enable or disable this alarm.

Intro/Update: 2.0.0/2.0.0

cfg sys/alm **vbiDegDelay**

Value(s): -1, 0, 1 to 120

Description: Specifies the VBI degrade alarm delay for service protection. When this alarm type contributes to a service alarm, the configured delay determines when (or if) the system triggers service protection.

-1 This value disables service protection for this alarm type.

0 This value causes service protection to be triggered immediately when this alarm type occurs.

1 to 120 This range of values adds a delay between the occurrence of this alarm type and the service protection failover. This alarm must persist for the configured delay to trigger the service protection. If the alarm clears before the delay time expires, the service continues without protective action.

Intro/Update: 7.5.0/7.5.0

cfg sys/alm **vbiDegSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level applied to the Vertical Blanking Interval (VBI) Degrade alarm (described below).

"VBI Degrade - Excessive VBI Errors" described on page 446

Note: Use the following commands to enable or disable this alarm.

cfg slot.s/enc.m/vbi vbideg
cfg slot.s/dec.m/vbi * vbideg

Intro/Update: 2.0.0/2.0.0

cfg sys/alm **vcDegDelay**

Value(s): -1, 0, 1 to 120

Description: Specifies the virtula circuit degrade alarm delay for service protection. When this alarm type contributes to a service alarm, the configured delay determines when (or if) the system triggers service protection.

-1 This value disables service protection for this alarm type.

0 This value causes service protection to be triggered immediately when this alarm type occurs.

1 to 120 This range of values adds a delay between the occurrence of this alarm type and the service protection failover. This alarm must persist for the configured delay to trigger the service protection. If the alarm clears before the delay time expires, the service continues without protective action.

Intro/Update: 7.5.0/7.5.0

cfg sys/alm **vcDegSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level applied to the following Virtual Channel (VC) degrade traps and alarms.

"VC Degrade - AAL-1 Un-correctable Errors" described on page 446
"VC Degrade - AAL-5 CRC Errors" described on page 447
"VC Degrade - Alarm Indication Signal (AIS) Received" described on page 447
"VC Degrade - Configuration Error" described on page 448
"VC Degrade - Loss of Receive Continuity" described on page 449
"VC Degrade - No Destination" described on page 449
"VC Degrade - Receive Buffer Overflow" described on page 449
"VC Degrade - Transmit Buffer Overflow" described on page 450
"VC Degrade - Transport Stream Error" described on page 450
"VC Degrade - Loss of Receive Continuity" described on page 449

Note: The following commands enable or disable these alarms for their respective areas.

cfg slot.s/atm/vc.m vcdeg
cfg slot.s/ip/vc.m vcdeg
cfg slot.s/mux/dxvc.m vcdeg
cfg slot.s/mux/mxvc.m vcdeg

Intro/Update: 2.0.0/2.0.0

cfg sys/alm **vcFltDelay**

Value(s): -1, 0, 1 to 120

Description: Specifies the virtual circuit fault degrade alarm delay for service protection. When this alarm type contributes to a service alarm, the configured delay determines when (or if) the system triggers service protection.

-1 This value disables service protection for this alarm type.

0 This value causes service protection to be triggered immediately when this alarm type occurs.

1 to 120 This range of values adds a delay between the occurrence of this alarm type and the service protection failover. This alarm must persist for the configured delay to trigger the service protection. If the alarm clears before the delay time expires, the service continues without protective action.

Intro/Update: 7.5.0/7.5.0

cfg sys/alm **vcFaultSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level applied to the following Virtual Channel (VC) fault traps and alarms
"VC Fault - Transport Stream Error" described on page 451

Note: The following commands enable or disable these alarms for their respective areas.
cfg slot.s/atm/vc.m vcflt
cfg slot.s/ip/vc.m vcflt
cfg slot.s/mux/dxvc.m vcflt
cfg slot.s/mux/mxvc.m vcflt

Intro/Update: 5.6.0/5.6.0

cfg sys/alm **vidDegDelay**

Value(s): -1, 0, 1 to 120

Description: Specifies the video degrade alarm delay for service protection. When this alarm type contributes to a service alarm, the configured delay determines when (or if) the system triggers service protection.

-1 This value disables service protection for this alarm type.

0 This value causes service protection to be triggered immediately when this alarm type occurs.

1 to 120 This range of values adds a delay between the occurrence of this alarm type and the service protection failover. This alarm must persist for the configured delay to trigger the service protection. If the alarm clears before the delay time expires, the service continues without protective action.

Intro/Update: 7.5.0/7.5.0

cfg sys/alm **vidDegSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level applied to the following Video Degrade traps and alarms.
"Video Degrade - EDH Error" described on page 451
"Video Degrade - Sync Error" described on page 451

Note: Use cfg slot.s/enc.m/vid viddeg to enable or disable this alarm.

Intro/Update: 2.0.0/2.0.0

cfg sys/alm **vidFltDelay**

Value(s): -1, 0, 1 to 120

Description: Specifies the video fault alarm delay for service protection. When this alarm type contributes to a service alarm, the configured delay determines when (or if) the system triggers service protection.

-1 This value disables service protection for this alarm type.

0 This value causes service protection to be triggered immediately when this alarm type occurs.

1 to 120 This range of values adds a delay between the occurrence of this alarm type and the service protection failover. This alarm must persist for the configured delay to trigger the service protection. If the alarm clears before the delay time expires, the service continues without protective action.

Intro/Update: 7.5.0/7.5.0

cfg sys/alm **vidFltSev**

Value(s): ignore, warning, minor, major, critical

Description: Sets the severity level applied the Video Fault trap and alarm.

"Video Fault - Loss of Video" described on page 452

Note: Use cfg slot.s/enc.m/vid vidflt to enable or disable this alarm.

Intro/Update: 2.0.0/2.0.0

23.3 Status Commands

Status commands provide detailed, read-only information about NetVX™'s operation.

23.3.1 ATM Interface Status Parameters

stat slot.s/atm/ifc.m

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

ifc.m m = Interface (ifc) number (1–2)
- ifc.1 Specifies the ATM module's SONET/SDH (OC-3 & STM1) interface. Use this index number to address the ATM-X11's BITS interface which is associated with the SONET/SDH optical interface.
- ifc.2 Specifies the ATM module's PDH (DS3/E3) interface.

Use these status parameters to monitor the system's ATM physical interfaces.

stat slot.s/atm/ifc.m **ais**

Value(s): fault, noFault

Description: Indicates composite Alarm Indication Signal (AIS) received for this interface. The physical interface's current operating standard (cfg slot.s/atm/ifc.m standard) controls which of the following conditions affect the state of this parameter.

stat slot.s/atm/ifc.1/ss lineAIS
stat slot.s/atm/ifc.1/ss pathAIS
stat slot.s/atm/ifc.2/ds3 lineAIS
stat slot.s/atm/ifc.2/e3 lineAIS

Intro/Update: 6.5.0/6.5.0

stat slot.s/atm/ifc.m **los**

Value(s): fault, noFault

Description: Provides a composite indicator of Loss of Signal (LOS) for the active interface when it is operating in any of the following modes: SS, DS3, E3

Intro/Update: 2.0.0/5.6.0

stat slot.s/atm/ifc.m **rdi**

Value(s): fault, noFault

Description: Indicates composite Remote Defect Indicator (RDI) received for this interface. The physical interface's current operating standard (cfg slot.s/atm/ifc.m standard) controls which of the following conditions affect the state of this parameter.

stat slot.s/atm/ifc.1/ss lineRDI
stat slot.s/atm/ifc.1/ss pathRDI
stat slot.s/atm/ifc.2/ds3 lineRAI
stat slot.s/atm/ifc.2/e3 lineRAI
stat slot.s/atm/ifc.2/e3 lineRDI

Intro/Update: 6.5.0/6.5.0

stat slot.s/atm/ifc.m **rxerrsec**

Value(s): Read Only
Description: Near End Errored Seconds. Includes coding violations, LOS, LOF, AIS, LOP, AAL5 (LOP is for SONET/SDH only).
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.m **rxrate**

Value(s): Read Only
Description: Indicates the ATM cell receive bitrate for the interface.
Intro/Update: 2.0.0/3.0.0

stat slot.s/atm/ifc.m **txerrsec**

Value(s): Read Only
Description: Far End Errored Seconds. Includes Far End coding violations (FEBEs) and RDI.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.m **txrate**

Value(s): Read Only
Description: Indicates the ATM cell transmit bitrate for the specified interface.
Intro/Update: 2.0.0/3.0.0

23.3.2 ATM Interface ATM Status Parameters

stat slot.s/atm/ifc.m/atm

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

ifc.m m = Interface (ifc) number (1–2)
- ifc.1 Specifies the ATM module's SONET/SDH (OC-3 & STM1) interface.
- ifc.2 Specifies the ATM module's PDH (DS3/E3) interface.

Use these status parameters to monitor the system's ATM interfaces.

stat slot.s/atm/ifc.m/atm **lcd**

Value(s): fault, noFault
Description: Loss of Cell Delineation. Not for PLCP.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.m/atm **rxcells**

Value(s): Read Only
Description: ATM Cells Received (non-stuffing).
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.m/atm **rxheccor**

Value(s): Read Only
Description: Counts cells with corrected HEC errors.
Intro/Update:2.0.0/2.0.0

stat slot.s/atm/ifc.m/atm **rxhecunc**

Value(s): Read Only
Description: Counts cells with un-correctable HEC errors.
Intro/Update:2.0.0/2.0.0

stat slot.s/atm/ifc.m/atm **rxproterr**

Value(s): Read Only
Description: Indicates the count of ATM protocol errors received.

Any change in this count from zero causes the LED next to the ATM card's input interface to go to amber. The errors counted are those defined by Bellcore standard GR-1248-CORE, ATM NEs Performance Management Requirements. Errors counted include the following:
"Unassigned VPI/VCI Value" — Unassigned means the module's VC table does not contain an entry with the given VPI/VCI. See also "The Virtual Channel Table" on page 63.
"Payload Type Indicator (PTI) Value Not Supported" — The PTI field in the ATM cell header holds a value that the receiver does not support.

Intro/Update:2.1.0/2.0.0

stat slot.s/atm/ifc.m/atm **txcells**

Value(s): Read Only
Description:ATM Cells Transmitted (non-stuffing).
Intro/Update:2.0.0/2.0.0

23.3.3 ATM Interface DS3 Status Parameters

stat slot.s/atm/ifc.2/ds3

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

ifc.2 Interface (ifc) number (2)
- ifc.2 Specifies the ATM module's PDH (DS3/E3) interface.

Use these status parameters to monitor DS3 interface(s).

stat slot.s/atm/ifc.2/ds3 **BPV**

Value(s): Read Only
Description: Bi-Polar Violations.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.2/ds3 **Cbit**

Value(s): Read Only
Description: C-bit Coding Violations. C-bit parity only.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.2/ds3 **EXZ**

Value(s): Read Only
Description: Excessive Zero Violations.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.2/ds3 **lineAIS**

Value(s): fault, noFault
Description: Indicates if this interface has received a "Line Alarm Indication Signal".
The "Line AIS" indicates that the immediate "upstream" piece of equipment has lost its input signal.
Note: The state of this parameter affects the state of stat slot.s/atm/ifc.m ais.
Intro/Update: 2.0.0/6.5.0

stat slot.s/atm/ifc.2/ds3 **lineRAI**

Value(s): present, notPresent
Description: This parameter indicates if a Line Remote Alarm Indication (RAI) is being received (G.751 only).
Note: The state of this parameter affects the state of stat slot.s/atm/ifc.m rdi.
Intro/Update: 2.0.0/6.5.0

stat slot.s/atm/ifc.2/ds3 **LOF**

Value(s): fault, noFault
Description: Loss of Frame.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.2/ds3 **LOS**

Value(s): fault, noFault
Description: Loss of Signal.
Intro/Update:2.0.0/2.0.0

stat slot.s/atm/ifc.2/ds3 **pathFEBE**

Value(s): fault, noFault
Description: Path FEBE Received. C-bit parity only.
Intro/Update:2.0.0/3.0.0

stat slot.s/atm/ifc.2/ds3 **Pbit**

Value(s): Read Only
Description:P-bit Coding Violations.
Intro/Update:2.0.0/2.0.0

23.3.4 ATM Interface E3 Status Parameters

stat slot.s/atm/ifc.2/e3

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

ifc.2 Interface (ifc) number (2)
- ifc.2 Specifies the ATM module's PDH (DS3/E3) interface.

Use these status parameters to monitor E3 interface(s).

stat slot.s/atm/ifc.2/e3 **LCV**

Value(s): fault, noFault
Description: Line Coding Violations.
Intro/Update: 2.2.0/2.2.0

stat slot.s/atm/ifc.2/e3 **lineAIS**

Value(s): fault, noFault
Description: Indicates if this interface has received a "Line Alarm Indication Signal". The "Line AIS" indicates that an upstream piece of equipment has either lost or stopped providing a signal.
Note: The state of this parameter affects the state of stat slot.s/atm/ifc.m ais.
Intro/Update: 2.2.0/5.6.0

stat slot.s/atm/ifc.2/e3 **lineBIP8**

Value(s): Read Only
Description: Line BIP-8 Error count (G.832 only).
Intro/Update: 2.2.0/2.2.0

stat slot.s/atm/ifc.2/e3 **lineRAI**

Value(s): present, notPresent
Description: This parameter indicates if a Line Remote Alarm Indication (RAI) is being received (G.751 only).
Note: The state of this parameter affects the state of stat slot.s/atm/ifc.m rdi.
Intro/Update: 2.2.0/6.5.0

stat slot.s/atm/ifc.2/e3 **lineRDI**

Value(s): present, notPresent
Description: This parameter indicates if a Line Remote Defect Indicator (RDI) is being received (G.832 only).
Note: The state of this parameter affects the state of stat slot.s/atm/ifc.m rdi.
Intro/Update: 2.2.0/6.5.0

stat slot.s/atm/ifc.2/e3 **lineREI**

Value(s): Read Only
Description: Line Remote Error Indicator Count. (G.832 only)
Intro/Update: 2.2.0/2.2.0

stat slot.s/atm/ifc.2/e3 **LOF**

Value(s): fault, noFault
Description: Indicates a Loss of Frame fault on the specified interface.
Intro/Update:2.2.0/2.2.0

stat slot.s/atm/ifc.2/e3 **LOS**

Value(s): fault, noFault
Description: Indicates a Loss of Signal fault on the specified interface.
Intro/Update:2.2.0/2.2.0

23.3.5 ATM Interface PLCP Status Parameters

stat slot.s/atm/ifc.2/plcp

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

ifc.2 Interface (ifc) number (2)
- ifc.2 Specifies the ATM module's PDH (DS3/E3) interface.

Use these status parameters to monitor DS3/E3 framing.

stat slot.s/atm/ifc.2/plcp **LOF**

Value(s): fault, noFault
Description: Loss of Frame. Current out-of-PLCP frame state.
Intro/Update:2.2.0/2.2.0

stat slot.s/atm/ifc.2/plcp **pathBIP8**

Value(s): Read Only
Description: Path BIP-8. PLCP Path BIP-8 errors.
Intro/Update:2.2.0/2.2.0

stat slot.s/atm/ifc.2/plcp **pathFEBE**

Value(s): Read Only
Description: Path Far End BIP-8 Errors.
Intro/Update:2.2.0/2.2.0

stat slot.s/atm/ifc.2/plcp **pathRAI**

Value(s): present, notPresent
Description: Indicates if Path Remote Alarm Indication (path RAI) errors are present.
Intro/Update:2.2.0/2.2.0

23.3.6 ATM Interface SONET/ SDH Status Parameters

stat slot.s/atm/ifc.1/ss

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

ifc.1 Interface (ifc) number (1)
- ifc.1 Specifies the ATM module's SONET/SDH (OC-3 & STM1) interface.

Use these status parameters to monitor SONET/SDH interface(s).

stat slot.s/atm/ifc.1/ss **bitserr**

Value(s): notPresent, present, unknown
Description: Indicates the count for BITS errors. When the count changes, it affects to the ATM BITS LED and contributes to an alarm (netDeg, Errors in Input Signal).
Note 1: The utility clear command resets this value to zero.
Note 2: If a module raises an alarm for this condition, the interface location identifies the optical interface, not the BITS interface.
Intro/Update: 6.7.0/6.7.0

stat slot.s/atm/ifc.1/ss **bitspres**

Value(s): notPresent, present, unknown
Description: Indicates the condition of BITS reference signal. This condition affects the BITS LED and contributes to an alarm (netDeg, Errors in Input Signal).
Note: If a module raises an alarm for this condition, the interface location identifies the optical interface, not the BITS interface.
Intro/Update: 6.7.0/6.7.0

stat slot.s/atm/ifc.1/ss **lineAIS**

Value(s): fault, noFault
Description: Indicates if this interface has received a "Line Alarm Indication Signal".
The "Line AIS" indicates that an upstream piece of equipment has either lost or stopped providing a signal.
Note: The state of this parameter affects the state of stat slot.s/atm/ifc.m ais.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.1/ss **lineBIP8**

Value(s): Read Only
Description: Provides a count of line BIP-8 errors.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.1/ss **lineFEBE**

Value(s): Read Only
Description: Provides a count of line FEBE errors.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.1/ss **lineRDI**

Value(s): present, notPresent
Description: Indicates the presence of line RDI errors.
Note: The state of this parameter affects the state of stat slot.s/atm/ifc.m rdi.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.1/ss **LOF**

Value(s): fault, noFault
Description: Indicates loss of frame (LOF) state on the selected interface.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.1/ss **LOP**

Value(s): fault, noFault
Description: Indicates loss of pointer (LOP) state on the selected interface.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.1/ss **LOS**

Value(s): fault, noFault
Description: Indicates loss of signal (LOS) state on the selected interface.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.1/ss **LOS**

Value(s): Not Present, Text String
Description: Indicates the interface's optical attributes (if any). ATM-X11 modules can detect various static and dynamic characteristics of their interface(s). If an interface has an optical component, the module represents its attributes (such as laser type, signal strength, etc.) in this variable. The text string is intended for operator convenience; its format and contents are unspecified. If the module does not have an optical interface, this value should be 'Not Present' or similar text.
Intro/Update: 6.7.0/6.7.0

stat slot.s/atm/ifc.1/ss **pathAIS**

Value(s): fault, noFault
Description: Indicates if this interface has received a "Path Alarm Indication Signal". The "Path AIS" indicates that an "upstream" piece of equipment has either lost or stopped providing a signal.
Note: The state of this parameter affects the state of stat slot.s/atm/ifc.m ais.
Intro/Update: 2.0.0/5.6.0

stat slot.s/atm/ifc.1/ss **pathBIP8**

Value(s): Read Only
Description: Provides a count of path BIP-8 errors.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.1/ss **pathFEBE**

Value(s): Read Only
Description: Provides a count of path FEBE errors.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.1/ss **pathRDI**

Value(s): present, notPresent
Description: Provides a count of path RDI errors.
Note: The state of this parameter affects the state of stat slot.s/atm/ifc.m rdi.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.1/ss **rxPathTraceRcv**

Value(s): <string>
Description: Indicates the path trace value received.
Note: See cfg slot.s/atm/ifc.m rxpathtraceexp and Network Degrade - Errors in Input Signal for more details.
Intro/Update: 8.1.1/8.1.1

stat slot.s/atm/ifc.1/ss **secBIP8**

Value(s): Read Only
Description: Provides a count of section BIP-8 errors.
Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/ifc.1/ss **txOptSig**

Value(s): Read Only
Description: Indicates the status of the optical transmitter signal on this interface.

degrade An optical transmitter is in use, and its performance is degraded. Though the optical component is not necessarily defective, this status value usually indicates a problem with the hardware. This condition is less severe than fault, but it may cause an alarm (Module Degrade - General Degrade). When asserting an alarm condition, the module should include diagnostic information in the alarm's description. This condition does not affect any LEDs.

fault An optical transmitter is in use and its performance is outside acceptable bounds. This status value usually indicates defective hardware and may cause an alarm (Module Fault - General Fault). When asserting an alarm condition, the module should include diagnostic information in the alarm's description. This condition does not affect any LEDs.

none This interface does not have an optical transmitter, or that transmitter is not currently in use. If the current configuration requires an optical transmitter, then this condition contributes to a fault alarm (Module Fault - General Fault).

normal The interface's optical transmitter is in use and is operating normally.

unknown This status value indicates the interface cannot obtain information about the optical transmitter. If the current configuration requires an optical transmitter then this condition contributes to an alarm (Module Fault - General Fault).

Intro/Update: 6.7.0/6.7.0

23.3.7 ATM Interface ATM VC Status Parameters

stat slot.s/atm/vc.m

slot.s s = Slot number.
3–17 SYS-1700's range of application module slot numbers.
2–4 SYS-200/SYS-300's range of application module slot numbers.

vc.m m = Virtual Channel Number (1–255)

Use these status parameters to monitor ATM Virtual Channels.

stat slot.s/atm/vc.m **ais**

Value(s): fault, noFault
Description: Indicates if an AIS is detected on the specified VC.
Intro/Update:(Available in a future release)

stat slot.s/atm/vc.m **cc**

Value(s): fault, noFault
Description: Indicates VC continuity fault state.
Intro/Update:(Available in a future release)

stat slot.s/atm/vc.m **rdi**

Value(s): present, notPresent
Description: Indicates if VC RDI is detected on VC.
Intro/Update:(Available in a future release)

stat slot.s/atm/vc.m **rxaal1cor**

Value(s): Read Only
Description: Provides a count of corrected AAL-1 PDUs.
Intro/Update:2.0.0/2.0.0

stat slot.s/atm/vc.m **rxaal1unc**

Value(s): Read Only
Description: Provides a count of uncorrected AAL-1 PDUs.
Intro/Update:2.0.0/2.0.0

stat slot.s/atm/vc.m **rxaal1SeqErr**

Value(s): Read Only
Description: Provides a count of AAL-1 sequence errors on this VC.
Intro/Update:3.0.0/3.0.0

stat slot.s/atm/vc.m **rxaal5crc**

Value(s): Read Only
Description: Provides a count of AAL-5 CRC errors.
Intro/Update:2.0.0/2.0.0

stat slot.s/atm/vc.m **rxaal5proterr**

Value(s): Read Only

Description: Maintains a count of AAL-5 protocol errors on the specified VC. Any change in this count from zero causes the LED next to the ATM card's input interface to go to amber. Errors counted include the following:

CRC errors If a CRC error is detected, remaining errors are not counted. Note that CRC errors use a separate counter.

Invalid CPI The CPI must be zero or an error occurs.

Oversized Received SDU The User Data part of the PDU exceeds the value of the length field.

Length Violation A Length of zero indicates a forward abort and is not counted as an error. Otherwise, the Length must be consistent with the PDU. That is, the length of the PDU minus the Length field value minus 8 should give the length of the padding. A PDU should have no more than 47 padding bytes.

Intro/Update: 2.2.0/3.3.0

stat slot.s/atm/vc.m **rxcells**

Value(s): Read Only

Description: Provides a count of ATM Cells Received. Includes user and OAM cells. Excludes unassigned and idle cells. Cell count is prior to policing.

Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/vc.m **rxdis**

Value(s): Read Only

Description: Provides a count of ATM cells discarded. This count is the number of cells dropped because they exceeded policing parameters.

Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/vc.m **rxpayrate**

Value(s): Read Only

Description: Indicates the bitrate of ATM payload being received through this VC.
This value includes only the payload, minus ATM cell headers and AAL-1, and AAL-5 overhead.

Note 1: For IP payload, the value includes IP headers.

Note 2: For transport stream payload, the value includes null packets received on the VC.

Intro/Update: 2.2.0/2.2.0

stat slot.s/atm/vc.m **rxpdus**

Value(s): Read Only

Description: Provides a count of ATM PDUs received.

Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/vc.m **rxrate**

Value(s): 0 to 155,000,000 bps

Description: Indicates the specified VC's receive bit rate based on ATM cells received over the last second.

Intro/Update: 2.0.0/2.0.0

stat slot.s/atm/vc.m **txcells**

Value(s): Read Only
Description: Provides a count of ATM cells transmitted.
Intro/Update:2.0.0/2.0.0

stat slot.s/atm/vc.m **txovf**

Value(s): Read Only
Description: Provides a count of the number of cells dropped due to transmit buffer overflow.
Intro/Update:2.0.0/2.0.0

stat slot.s/atm/vc.m **txpayrate**

Value(s): 0 to 155,000,000 bps
Description: Indicates the transmit payload bitrate on this VC.
Intro/Update:3.0.0/3.0.0

stat slot.s/atm/vc.m **txpdus**

Value(s): Read Only
Description: Provides a count PDUs transmitted.
Intro/Update:2.0.0/2.0.0

stat slot.s/atm/vc.m **txrate**

Value(s): 0 to 155,000,000 bps
Description: Indicates the specified VC's transmission bit rate based on ATM cells transmitted over the last second.
Intro/Update:2.0.0/2.0.0

23.3.8 DEC Audio Status Parameters

stat slot.s/dec.m/aud.n

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dec.m m = Decoder number. Only option is "1" on the DEC-S11. Therefore this may be omitted altogether in command lines – see examples.

aud.n n = Audio channel number (1–7).
- 1–2 Primary and secondary audio channels.
- 3* The ENC-H11 and ENC-A21 provide a third audio channel.
- 3–7 * Associated audio channels.

Note: * Availability of this selection is determined by the module's feature profile.
See Table 19-5, "DEC-S11 Module Type Definitions" on page 142. See also util key .

Use these status parameters to monitor audio decoding.

stat slot.s/dec.m/aud.n **audpres**

Value(s): present, notPresent
Description: Indicates the presence of audio in the specified program.
Intro/Update:2.0.0/2.0.0

stat slot.s/dec.m/aud.n **decerr**

Value(s): Read Only
Description: Maintains a count of audio decoding errors.
Intro/Update:2.0.0/2.0.0

stat slot.s/dec.m/aud.n **standard**

Value(s): ac3, mpeg, smpte302, unknown
Description: Specifies the audio decoding standard.
Intro/Update:2.0.0/5.6.0

23.3.9 DEC Program Status Parameters

stat slot.s/dec.m/pgm

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dec.m m = Decoder number. Only option is "1" on the DEC-S11. Therefore this may be omitted altogether in command lines – see examples.

Use these status parameters to monitor program decoding.

stat slot.s/dec.m/pgm **casysid**

Value(s): text
Description: Indicates the conditional access system identifier.
If the program stream carries a conditional access descriptor, this value is set to the CA system identifier from that descriptor (a 16-bit unsigned value). The decoder sets this value to -1 to indicate the CA descriptor is not present.
Note 1: For additional information, see ETR 162, Digital broadcasting systems for television, sound and data services; Allocation of Service Information (SI) codes for Digital Video Broadcasting (DVB) systems.
Note 2: The util clear command sets this value to -1.
Intro/Update: 5.7.0/5.7.0

stat slot.s/dec.m/pgm **datachars**

Value(s): text
Description: Provides a count of data bytes received.
Intro/Update: 7.5.0/7.5.0

stat slot.s/dec.m/pgm **datadrop**

Value(s): text
Description: Provides a count of dropped data bytes.
Intro/Update: 7.5.0/7.5.0

stat slot.s/dec.m/pgm **ccerr**

Value(s): text
Description: Provides a count of continuity errors on all PIDs in the transport stream.
Intro/Update: 4.0.0/4.0.0

stat slot.s/dec.m/pgm **name**

Value(s): text
Description: Indicates the program name, as listed in the SDT.
Intro/Update: 2.0.0/2.0.0

stat slot.s/dec.m/pgm **pgmpres**

Value(s): present, notPresent
Description: Indicates the program allocation table (PAT) contains an entry for the configured program.
Intro/Update:2.0.0/2.0.0

stat slot.s/dec.m/pgm **prognum**

Value(s): 0, 1 to 65535
Description: Identifies the number of the program that this decoder is configured to decode.
Intro/Update:N/A – Not Implemented

stat slot.s/dec.m/pgm **tserr**

Value(s): Read Only
Description: Transport stream error count.
Intro/Update:2.0.0/2.0.0

stat slot.s/dec.m/pgm **tspres**

Value(s): present, notPresent
Description: Transport Stream Present.
Intro/Update:2.0.0/2.0.0

stat slot.s/dec.m/pgm **tsrate**

Value(s): 0.000 to 70.000 (Mbps)
Description: Specifies the bit rate for the entire transport stream.
Audio, closed captions, VBI line data, VANC data, and other overhead are deducted from this value to calculate the video rate.
Intro/Update:2.0.0/5.0.0

23.3.10 DEC VBI Field and Line Status Parameters

stat slot.s/dec.m/vbi/fld.f/lin.l

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dec.m m = Decoder number. Only option is "1" on the DEC-S11. Therefore this may be omitted altogether in command lines – see examples.

fld.f f = Field number (1–2)
- 1 Video field 1.
- 2 Video field 2.

lin.l l = Line number (5-22; 273-285). See Table 23-8, "VBI Field and Line Number Setting Constraints" on page 221 for more details.

Note: VBI *
* Availability of this selection is determined by the module's feature profile.
See Table 19-5, "DEC-S11 Module Type Definitions" on page 142. See also util key .

Use these status parameters to monitor VBI signals received by the decoder.

stat slot.s/dec.m/vbi/fld.f/lin.l **errstat**

Value(s): fault, nofault
Description: Indicates the fault condition for excessive VBI errors.
Intro/Update: 4.0.0/4.0.0

stat slot.s/dec.m/vbi/fld.f/lin.l **function**

Value(s): dvitc, lossless, none, testPattern, wst, wss, closedcaption
Description: Indicates the type of VBI service present in video. See the "cfg slot.s/enc.m/vbi/fld.f/lin.l function" command on page 221 for details.
Intro/Update: 2.0.0/4.0.0

stat slot.s/dec.m/vbi/fld.f/lin.l **testpattern**

Value(s): none, ntsc-75colorbars, ntsc-100colorbars, ntsc-combination, ntsc-composite, ntsc-eq, ntsc-flat, ntsc-pll, ntsc-ramp, ntsc-sinx, pal-ccir17, pal-ccir18, pal-ccir330, pal-ccir331, pal-75colorbars, pal-100colorbars, pal-eq, pal-its1, pal-its2, pal-flat, pal-pll, pal-ramp, pal-sinx
Description: Indicates the type of test pattern specified by the VBI service. See the "cfg slot.s/enc.m/vbi/fld.f/lin.l function" command on page 221 for details.
Intro/Update: 2.0.0/5.2.0

23.3.11 DEC Video Status Parameters

stat slot.s/dec.m/vid

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dec.m m = Decoder number. Only option is "1" on the DEC-S11. Therefore this may be omitted altogether in command lines – see examples.

Use these status parameters to monitor video decoding.

stat slot.s/dec.m/vid **decerr**

Value(s): Read Only
Description: Provides a count of video frames containing errors.
Intro/Update: 2.0.0/2.0.0

stat slot.s/dec.m/vid **frame**

Value(s): 29.97, 25, unknown
Description: Indicates the frame rate of incoming video.
Intro/Update: 2.0.0/3.0.0

stat slot.s/dec.m/vid **hres**

Value(s): 0 to 720
Description: Indicates the horizontal resolution of incoming video.
Intro/Update: 2.0.0/2.0.0

stat slot.s/dec.m/vid **profile**

Value(s): 4:2:2 *, 4:2:0, unknown
Description: Indicates the profile of incoming video.
Note: * Availability of this selection is determined by the module's feature profile.
See Table 19-5, "DEC-S11 Module Type Definitions" on page 142. See also util key .
Intro/Update: 2.0.0/3.0.0

stat slot.s/dec.m/vid **vidpres**

Value(s): present, notpresent, unknown
Description: Indicates whether or not video is present.
unknown May indicate that the decoder is presenting a test pattern.
Intro/Update: 2.0.0/2.0.0

stat slot.s/dec.m/vid **vres**

Value(s): 0 to 608
Description: Indicates the vertical resolution of incoming video.
Intro/Update: 2.0.0/2.0.0

23.3.12 ENC Audio Status Parameters

stat slot.s/enc.m/aud.n

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

aud.n n = Audio channel number (1–7).
- 1–2 Primary and secondary audio channels.
- 3* The ENC-H11 and ENC-A21 provide a third audio channel.
- 3–7 * Associated audio channels.

Note: * Availability of this selection is determined by the module's feature profile.
See Table 19-5, "DEC-S11 Module Type Definitions" on page 142. See also util key .

Use these status parameters to monitor video encoding.

stat slot.s/enc.m/aud.n **avsync**

Value(s): Read Only

Description: Indicates the audio/video sync adjustment count.

When the audio and video streams have different time bases, they can drift apart over time. When their relative timing difference becomes too large, the encoder adjusts its internal timing to bring them into agreement. This condition doesn't necessarily mean either audio or video has errors; but the lack of synchronization can be an important diagnostic for some applications.

When an encoder receives a new configuration or reacquires its audio/video, it can increment this value when synchronizing the inputs.

Note 1: In some cases, the encoder might not have video input, or it might derive its time base from an input other than video. This counter actually applies to audio synchronization adjustments relative to the time base. Video normally supplies that time base, but some exceptions exist.

Note 2: This counter contributes to an alarm (audDeg, Audio/Video Sync Adjust).

Note 3: The utility clear command resets this value to zero.

Intro/Update: 6.6.0/6.6.0

stat slot.s/enc.m/aud.n **crcerr**

Value(s): Read Only

Description: Maintains a count of audio CRC errors.

Intro/Update: 2.0.0/2.0.0

stat slot.s/enc.m/aud.n **diglos**

Value(s): fault, nofault, unknown

Description: Indicates loss of signal fault.

This variable applies only to digital inputs and indicates a loss of framing (AES or SDI).

Intro/Update: 2.0.0/2.0.0

stat slot.s/enc.m/aud.n **embedchan**

Value(s): Read Only
Description: Indicates the embedded audio channel supporting this audio encoder.
0 Indicates embedded audio is not present.
1–2 Indicates the input embedded audio channel.
Intro/Update: 2.2.0/2.2.0

stat slot.s/enc.m/aud.n **embedgroup**

Value(s): Read Only
Description: Indicates the embedded audio group supporting this audio encoder.
0 Indicates embedded audio is not present.
2–4 Indicates the input embedded audio group.
Intro/Update: 2.2.0/2.2.0

stat slot.s/enc.m/aud.n **embedpres**

Value(s): present, notPresent, unknown
Description: Indicates if embedded audio is present for the specified audio channel.
Intro/Update: 2.2.0/2.2.0

stat slot.s/enc.m/aud.n **input**

Value(s): analog, unknown, digital, embedded, tone, mute
Description: Indicates the source of active audio input for this audio channel.
Intro/Update: 2.0.0/3.0.0

stat slot.s/enc.m/aud.n **support**

Value(s): fault, noFault, unknown
Description: Indicates if there is an embedded audio fault.
The encoder asserts this fault when it cannot process the input audio, or when the configuration parameters conflict, making the audio processing impossible. Possible causes include, but are not limited to, the following configuration issues:
Note 1: The encoder is configured to receive compressed audio but is receiving uncompressed.
Note 2: Embedded audio is received in an unexpected format.
Note 3: The encoder's two audio interfaces are configured for different encoding standards.
Note 4: The audio encoder is configured for an invalid rate.
Intro/Update: 2.2.0/2.2.0

23.3.13 ENC Vertical Ancillary Data Status Parameters

stat slot.s/enc.m/vanc

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

Use these status parameters to monitor vertical ancillary data encoding.

stat slot.s/enc.m/vanc **drop**

Value(s): Read Only

Description: Maintains a count of dropped vertical ancillary data packets.

Intro/Update: 4.3.0/4.3.0

stat slot.s/enc.m/vanc **klvdrop**

Value(s): Read Only

Description: Indicates the dropped packet count for KLV-encoded metadata.

If the actual incoming metadata exceeds the configured KLV-encoded metadata rate, the encoder can drop data from the stream. The dropped packet count accumulates in this status variable.

Note 1: Note that metadata processed as a VANC service and policed by the VANC rate would be counted in the VANC dropped packet count.

Note 2: If the module drops KLV-encoded metadata packets, it will declare an alarm (vancDeg, VANC error). The utility clear command resets this value to zero.

Intro/Update: 7.7.0/7.7.0

stat slot.s/enc.m/vanc **klvrate**

Value(s): 0 to 2000.00 kbps

Description: Indicates the peak bitrate for KLV-encoded metadata (computed once per second).

This value gives the rate of the independent KLV-encoded metadata, inserted into the encoder's transport stream output. This does not include KLV metadata extracted as a VANC service, using the VANC DID filter.

If the actual incoming metadata exceeds the configured KLV-encoded metadata rate, the encoder can drop data from the stream. The resulting KLV metadata rate status reflects only data put into the output transport stream. The encoder counts dropped data packets, but it does not maintain rate status for the excessive KLV metadata.

Intro/Update: 4.3.0/6.0.0

stat slot.s/enc.m/vanc **op47drop**

Value(s): (Numeric Value)

Description: Indicates the dropped line count for OP-47 subtitling.

If the actual incoming teletext subtitling exceeds the configured OP-47 line count, the encoder can drop data from the stream. The dropped line count accumulates in this status variable.

Note 1: Note that OP-47 subtitling processed as a VANC service and policed by the VANC rate would be counted in the VANC dropped packet count.

Note 2: If the module drops OP-47 lines, it will declare an alarm (vancDeg, VANC error). The utility clear command resets this value to zero.

Intro/Update: 7.7.0/7.7.0

stat slot.s/enc.m/vanc **op47lines**

Value(s): (Numeric Value)

Description: Indicates the peak OP-47 teletext lines/frame in the last few seconds. This value gives the high watermark of the independent OP-47 teletext subtitling, inserted into the encoder's transport stream output. This does not include subtitling extracted as a VANC service, using the VANC DID filter.

If the actual incoming teletext exceeds the configured OP-47 line limit, the encoder can drop data from the stream. The resulting OP-47 peak line count status reflects only data put into the output transport stream.

Intro/Update: 7.7.0/7.7.0

stat slot.s/enc.m/vanc **vancrate**

Value(s): 0 to 2000.00 kbps

Description: Indicates the peak bitrate for vertical ancillary data (computed once per second). This value gives the aggregate rate of VANC data inserted into the encoder's transport stream output. Depending on the configured VANC DID filter, the aggregate value might stem from unfiltered data, or it can be the sum of the rates for individual services.

If the actual incoming VANC data exceeds the configured VANC data rate, the encoder can drop data from the stream. The resulting aggregate VANC data rate status reflects only data put into the output transport stream. The encoder counts dropped data packets, but it does not maintain status for the incoming VANC data rate.

Intro/Update: 4.3.0/6.0.0

23.3.14 ENC Vertical Ancillary Data Service Status Parameters

stat slot.s/enc.m/vanc/srv.n

slot.s s = Slot number.

3–17 SYS-1700's range of application module slot numbers.

2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

srv.n Vertical ancillary data service number (1–16).

Use these status parameters to monitor vertical ancillary data encoding services.

stat slot.s/enc.m/vanc/srv.n **rate**

Value(s): # Kbps
Description: Indicates the measured vertical ancillary data bit rate for this service.
Intro/Update:4.3.0/6.0.0

stat slot.s/enc.m/vanc/srv.n **srvpres**

Value(s): present, notPresent, unknown
Description: Indicates the presence of the specified vertical ancillary data service.
Intro/Update:4.3.0/4.3.0

23.3.15 ENC VBI Status Parameters

stat slot.s/enc.m/vbi

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

Use this status parameter to monitor encoder VBI service errors.

stat slot.s/enc.m/vbi **errstat**

Value(s): fault, nofault, unknown
Description: Fault indicates that an excessive number of errors for this service have been detected.
Intro/Update:2.0.0/4.0.0

23.3.16 ENC VBI Field and Line Status Parameters

stat slot.s/enc.m/vbi/fld.f/lin.l

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

srv.n n = Vertical ancillary data service number (1–16).

fld.f f = Field number (1–2)
- 1 Video field 1.
- 2 Video field 2.

lin.l l = Line number (5–22; 273–285) See Table 23-8, "VBI Field and Line Number Setting Constraints" on page 221 for more details.

Use these status parameters to monitor encoder VBI field errors and service state.

stat slot.s/enc.m/vbi/fld.f/lin.l **err**

Value(s): Read Only
Description: Maintains a count of teletext CRC errors or CC parity errors on the specified field and line.
Intro/Update:4.0.0/4.0.0

stat slot.s/enc.m/vbi/fld.f/lin.l **service**

Value(s): present, notPresent, unknown
Description: Indicates if VBI service is present on the specified field and line.
Intro/Update:4.0.0/4.0.0

23.3.17 ENC Video Status Parameters

stat slot.s/enc.m/vid

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

enc.m m = Encoder number. Only option is "1" on the "ENC-xxx" series of encoders. Therefore this parameter may be omitted in command lines. See the following examples.

Use these status parameters to monitor encoding video errors.

stat slot.s/enc.m/vid **cccount**

Value(s): Read Only

Description: Indicates the count of closed caption characters extracted from the input (regardless of source) and inserted into the stream.

Intro/Update: 6.5.1/6.5.1

stat slot.s/enc.m/vid **edhLErr**

Value(s): Read Only

Description: Indicates the number of fields having a error detected here (EDH) line error.

A line error exists in an SDI signal when the signal contains a valid EDH packet and the calculated full-field CRC does not match the value in the EDH packet. As explained in SMPTE RP 165, the CRC applies to the previous field.

Intro/Update: 2.0.0/2.0.0

stat slot.s/enc.m/vid **edhPErr**

Value(s): Read Only

Description: Indicates the number of fields having an EDH path error.

A path error exists in an SDI signal when the signal contains a valid EDH packet and at least one of the three error detected already (EDA) flags is set to 1. There are separate EDA flags for the full field, for the active picture, and for the ancillary data.

Intro/Update: 2.0.0/2.0.0

stat slot.s/enc.m/vid **edhPres**

Value(s): present, notPresent

Description: Indicates the presence of the EDH ancillary data packet in video.

Intro/Update: 2.0.0/2.0.0

stat slot.s/enc.m/vid **input**

Value(s): Possible ENC-H11 Values: sdi-525, sdi-625, black-525, black-625, black-720-59, black-1080-25, black-1080-29, sdi-720-59, sdi-1080-25, sdi-1080-29, unknown
Possible ENC-S11/ENC-S21 Inputs: black-525, black-625, comp-ntsc, comp-ntsc-j, comp-pal, comp-pal-m, sdi-525, sdi-625, unknown

Description: Identifies the type of active input. Indicates "none" if the encoder cannot acquire a signal.

Intro/Update: 2.0.0/7.0.0

stat slot.s/enc.m/vid **LOS**

Value(s): fault, noFault

Description: Indicates a loss of the video signal. This fault is indicated after one continuous second of loss of video framing (digital) or loss of sync detect (analog).

Intro/Update: 2.0.0/2.0.0

stat slot.s/enc.m/vid **rate**

Value(s): 0.000 to 50.000 (Mbps, 2.3 fixed format)

Description: Average elementary stream bit rate.

Intro/Update: 2.0.0/2.0.0

stat slot.s/enc.m/vid **syncErr**

Value(s): Read Only

Description: Sync Error count. Indicates an error has been detected in the last second on analog input. Includes framing/sync losses of less than 1 second duration.

Intro/Update: 2.0.0/2.0.0

stat slot.s/enc.m/vid **viPres**

Value(s): Read Only

Description: Indicates whether the video index (VI) information is present in the video. When present, this information specifies the aspect ratio of the video, letting the system insert an appropriate Active Format Description (AFD).

A standard definition encoder's SDI input signal can carry VI. If the configured input signal is sdi-*, the input is present, locked, and standard definition, and the SDI stream carries VI information, the VI status will report present. Otherwise the module will report ‘notPresent’.

Intro/Update: 7.2.0/7.2.0

23.3.18 SYS General Module Status Parameters

stat slot.s/gen

slot.s s = Slot number.
3–17 SYS-1700's range of application module slot numbers.
2–4 SYS-200/SYS-300's range of application module slot numbers.

Use these status parameters to monitor slot status. This information can helpful for determining the state of installed boards before and after a failover.

stat slot.s/gen **failSlot**

Value(s): 0 to 63
Description: Indicates the slot number for which this module is actively providing backup protection.
Use this command to identify which module to replace following a failover.
0 Indicates the module in this slot has not taken over any other module's operation.
1–63 Indicates the module in this slot is actively acting as a backup for the module in the indicated slot.
Intro/Update: 2.2.0/5.0.0

stat slot.s/gen **fault**

Value(s): Text message
Description: Indicates the last fault (or debugging message) that the module in the respective slot has reported.
Intro/Update: 2.0.0/5.0.0

stat slot.s/gen **led1**

Value(s): OFF, green amber, red
Description: This LED is located at the top of every module except the SYS-G10.
Indicates the peripheral module's "fault" LED color.
Intro/Update: 2.0.0/2.0.0

stat slot.s/gen **led2**

Value(s): OFF, green amber, red
Description: Indicates the peripheral module's LED-2 color.
See documentation on the specific module in the NetVX™ Reference Manual for details.
Intro/Update: 2.0.0/2.0.0

stat slot.s/gen **led3**

Value(s): OFF, green amber, red
Description: Indicates the peripheral module's LED-3 color.
See documentation on the specific module in the NetVX™ Reference Manual for details.
Intro/Update: 2.0.0/2.0.0

stat slot.s/gen **led4**

Value(s): OFF, green amber, red

Description: Indicates the peripheral module's LED-4 color.

See documentation on the specific module in the NetVX™ Reference Manual for details.

Intro/Update: 2.0.0/2.0.0

stat slot.s/gen **led5**

Value(s): OFF, green amber, red

Description: Indicates the peripheral module's LED-5 color.

See documentation on the specific module in the NetVX™ Reference Manual for details.

Intro/Update: 2.0.0/2.0.0

stat slot.s/gen **protavail**

Value(s): available, unavailable, unneeded

Description: Indicates the availability of the module assigned to protect the module in this slot.

available This slot has an assigned protection module that is ready to perform its duties. To qualify as available, the protection module must be of the appropriate module type, it must be in service, and it must not be carrying the service of another failed module.

failedTo–2, …, failedTo–17 This slot has an assigned protection module, and that module has taken over this module's service. In other words, the current slot's module has failed, and this value identifies the backup module that is operating in its place. Slots in the range of 2 to 17 may be specified.

unavailable This slot has an assigned protection module, but that module is currently unavailable. Consequently, this module is supposed to be protected, but it currently is not.

unneeded This slot does not have an assigned protection module. This module is not protected, but that is considered to be the normal state.

Intro/Update: 2.2.0/3.3.0

stat slot.s/gen **version**

Value(s): <string>

Description: Indicates the version of firmware currently running on the module.

The running firmware usually matches the version installed as “current” (stat sys/gen version), but a firmware upgrade can cause a mismatch until a system reset. The system asserts a module alarm (Module Degrade - Configuration Error) when this mismatch exists.

Note: When stat slot.s/gen version command is used with the current system controller, is identical to the stat sys/gen version command.

Intro/Update: 5.7.0/5.7.0

stat slot.s/gen **sernum**

Value(s): YYDVMMXXXXXX

Description: Indicates the serial number of the module installed in the specified slot.

YY Year

DV Internal identifier.

MM Month

XXXXXX Internal identifier.

Intro/Update: 4.0.0/4.0.0

stat slot.s/gen **softwareflt**

Value(s): fault, nofault

Description: Indicates the module is experiencing a serious software fault.
This fault condition is very rare and may be the result of an incomplete software upgrade.

Intro/Update: 2.0.0/2.0.0

stat slot.s/gen **status**

Value(s): booting, fault, inService, offline, wrongType

Description: Indicates the state of the module in the specified slot.

booting This value indicates the module has been reset and is still initializing itself. A booting module should transition to some other state in a “reasonable” time. The system controller automatically sets a module's status to fault after a suitable time-out period.

fault This value indicates the module has a hardware problem that prevents it from operating properly. The module should be replaced.

inService This value indicates the module is enabled and operating normally.

none This value indicates the slot has been configured not to have a module and therefore has no status.

notPresent This value indicates the slot should contain a module but does not (or the module detected is unrecognized).

offline This value indicates the module is operating normally, but it has been disabled.

wrongType This value indicates the configured module type does not match the actual module type. The module itself might be operating completely normally, but this condition still affects the module LED to alert the operator to the configuration error.

Intro/Update: 2.0.0/5.0.0

stat slot.s/gen **type**

Value(s): Text string.
See the "cfg slot.s/gen type" command on page 240 for a complete list of all module types.

Description: Indicates the type of the module installed in this slot. The type includes the hardware base type and the key suffix.

Intro/Update: 2.0.0/7.0.0

23.3.19 SYS, GBE IP Interface Status Parameters

stat slot.s/ip/ifc.m

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

ifc.m m = Interface number.
- 1 Range of interfaces for the SYS-G10 System Controller module.
- 1–2 Range of interfaces for the SYS-A12 System Controller module.

On the SYS-G10 System Controller Module, these parameters are identical to those in stat sys/ip/eth.

stat slot.s/ip/ifc.m **igmpversion**

Value(s): unknown, v1, v2, v3

Description: Indicates the IGMP version for the interface.

unknown The interface has not yet received an IGMP poll from the router that would allow it to determine what version of IGMP to use.

v1 IGMP version 1.

v2 IGMP version 2.

v3 IGMP version 3 provides additional features over version 1 and 2, such as the ability to designate a particular originator for a multicast group.

Note: Only the GBE-C11can indicate the IGMP version number.

Intro/Update: 6.6.0/6.6.0

stat slot.s/ip/ifc.m **link**

Value(s): 10BaseT, 10BaseT-half,
100BaseT, 100BaseT-half,
1000BaseT, 1000BaseT-half,
lost, negotiating, optical, unknown

Description: Indicates the operational status of the Ethernet link.

10BaseT The interface has detected a 10BaseT signal (full duplex).

10BaseT-half The interface has detected a 10BaseT signal (half duplex).

100BaseT The interface has detected a 100BaseT signal (full duplex).

100BaseT-half The interface has detected a 100BaseT signal (half duplex).

1000BaseT The interface has detected a 1000BaseT signal (full duplex).

1000BaseT-half The interface has detected a 1000BaseT signal (half duplex).

lost The interface has lost link connectivity with its Ethernet.

negotiating Some interfaces can communicate at several speeds, and they often negotiate an acceptable speed with the device at the other end of the wire. This value indicates the startup negotiation is still in progress.

optical The interface has detected an optical signal.

unknown The interface status is unknown. This sometimes happens when the hardware does not respond to status requests, but this should be a temporary condition.

Note: This status parameter is identical to the stat sys/ip/eth link.

Intro/Update: 2.2.0/5.6.0

stat slot.s/ip/ifc.m **macaddr**

Value(s): xx.xx.xx.xx.xx.xx

Description: Indicates the NetVX™'s Ethernet MAC address.

Note: This status parameter is identical to the stat sys/ip/eth macaddr.

Intro/Update: 2.2.0/3.3.0

stat slot.s/ip/ifc.m **optattr**

Value(s): Read Only

Description: Indicates the interface's optical attributes (if any).

IP modules can detect various static and dynamic characteristics of their interface(s). Some characteristics, such as the link status have their own status variables. If an interface has an optical component, the module represents its attributes (such as laser type, signal strength, etc.) in this variable. The text string is intended for operator convenience; its format and contents are unspecified. If the module does not have an optical interface, this value should be "Not present" or similar text.

Intro/Update: 5.6.0/5.6.0

stat slot.s/ip/ifc.m **rxbufferr**

Value(s): Read Only

Description: Indicates the errored second count for receive buffer errors on this interface.

The IP module normally moves received packets from the input buffer through the processing chain. If, however, something slows the pipeline, the receive buffer can overflow, causing packets to be discarded.

Intro/Update: 5.5.0/5.5.0

stat slot.s/ip/ifc.m **rxdatabufferr**

Value(s): Read Only

Description: Indicates the errored second count for receive data buffer errors on this interface.

In this context, data includes everything except those packets associated with channels carrying MPEG. Some IP modules without their own IP routing stack move received data packets from the input buffer, across the backplane, to an IP module with routing (such as the system controller). If, however, too many data packets arrive or something slows the pipeline, the data receive buffer can overflow, causing packets to be discarded.

Intro/Update: 5.5.0/5.5.0

stat slot.s/ip/ifc.m **rxdatapkts**

Value(s): Read Only

Description: Indicates the number of data packets received on this interface.

In this context, data packets include all packets except those associated with channels carrying MPEG.

Intro/Update: 5.5.0/5.5.0

stat slot.s/ip/ifc.m **rxdatarate**

Value(s): Read Only

Description: Indicates the computed receive data bitrate on this interface.

In this context, data rate include all packets except those associated with channels carrying MPEG.

Intro/Update: 5.5.0/5.5.0

stat slot.s/ip/ifc.m **rxerrpkts**

Value(s): Read Only

Description: Indicates the number of errored packets received on this interface.
Errors include a bad CRC and any other conditions that show packet corruption.

Intro/Update: 5.5.0/5.5.0

stat slot.s/ip/ifc.m **rxerrsec**

Value(s): Read Only

Description: Provides a count of errored seconds on this receive interface.
Generally, this error category includes conditions that originate inside the NetVX™ itself. This count is a composite of the counts for
stat slot.s/ip/ifc.m rxbufferr, stat slot.s/ip/ifc.m rxdatabufferr, stat slot.s/ip/ifc.m rxerrpkts
Additionally, if a virtual channel is enabled on an interface, its status variables contribute to the active interface.

Intro/Update: 5.5.0/5.5.0

stat slot.s/ip/ifc.m **rxpkts**

Value(s): Read Only

Description: Indicates the total count of ethernet packets received on this interface.

Intro/Update: 5.5.0/5.5.0

stat slot.s/ip/ifc.m **rxrate**

Value(s): Read Only

Description: Indicates the computed receive total bitrate on this interface.
This value gives the full bandwidth, including IP headers and non-IP data, independent from the payload. Consequently, the system can monitor the incoming traffic without having to parse the data.

Intro/Update: 5.5.0/5.5.0

stat slot.s/ip/ifc.m **txdatapkts**

Value(s): Read Only

Description: Indicates the number of data packets transmitted on this interface.
In this context, data packets include all packets except those associated with channels carrying MPEG.

Intro/Update: 5.5.0/5.5.0

stat slot.s/ip/ifc.m **txdatarate**

Value(s): Read Only

Description: Indicates the computed transmit data bitrate on this interface.
This rate includes all packets except those associated with VCs carrying MPEG. Therefore this parameter indicates the rate of all non-MPEG data transmitted over this interface.

Intro/Update: 5.5.0/5.5.0

stat slot.s/ip/ifc.m **txerrsec**

Value(s): Read Only

Description: Indicates the count of transmit errored seconds on this interface. Conditions that originate outside of the NetVX™ may contribute to this count.

Intro/Update: 5.5.0/5.5.0

stat slot.s/ip/ifc.m **txoptsig**

Value(s): Read Only… degrade, fault, none, unknown

Description: Indicates the status of the optical transmitter signal on this interface.

degrade An optical transmitter is in use and its performance is degraded.

fault An optical transmitter is in use and its performance is outside acceptable bounds. This condition usually indicates defective hardware.

none This interface does not have an optical transmitter

normal The interface's optical transmitter is in use and is operating normally.

unknown The interface cannot obtain information about the transmitter.

Intro/Update: 5.6.0/5.6.0

stat slot.s/ip/ifc.m **txovf**

Value(s): Read Only

Description: Indicates the errored second count for transmit buffer overflow on this interface.

The IP module normally moves outgoing packets through the processing chain to the output buffer. If, however, something slows the pipeline, the transmit buffer can overflow, causing packets to be discarded.

Note: Applicable only to the GBE module.

Intro/Update: 5.5.0/5.5.0

stat slot.s/ip/ifc.m **txpackets**

Value(s): Read Only

Description: Indicates the total count of ethernet packets transmitted on this interface.

Intro/Update: 5.5.0/5.5.0

stat slot.s/ip/ifc.m **txrate**

Value(s): Read Only

Description: Indicates the computed transmit total bitrate on this interface.

This value gives the full bandwidth, including IP headers and non-IP data, independent from the payload. Consequently, the system can monitor the outgoing traffic without having to parse the data.

Intro/Update: 5.5.0/5.5.0

23.3.20 SYS, GBE IP Routing Status Parameters

stat slot.s/ip/rte.m

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

rte.m m = Index for the IP routing table entry number (1–63).
- 1 Represents the first row of the routing table and is reserved for the default routing destination 0.0.0.0. This address refers to the local system.
- 2–63 Represent the remaining rows in the routing table.

stat slot.s/ip/rte.m **destaddr**

Value(s): IP Address
Description: Indicates the IP destination address for this IP routing table entry.
Note: Not applicable to GBE-series modules.
Intro/Update: 2.2.0/3.3.0

stat slot.s/ip/rte.m **destmask**

Value(s): IP Address
Description: Specifies the subnet mask for the destination host or subnet.
Note: Not applicable to GBE-series modules.
Intro/Update: 2.2.0/3.3.0

stat slot.s/ip/rte.m **distance**

Value(s): 0–16
Description: Specifies the number of hops to reach the destination. This value follows the RIP convention: 0 indicates a direct address (the destination is on this NetVX™), and 16 indicates the destination is unreachable.
Note: Not applicable to GBE-series modules.
Intro/Update: 2.2.0/4.0.0

stat slot.s/ip/rte.m **hopaddr**

Value(s): IP Address
Description: Indicates the IP address of the next system or subnet to which the packet is sent while en route to the destination address. The value 0.0.0.0 indicates packets are forwarded to the interface's default router.
Note: Not applicable to GBE-series modules.
Intro/Update: 2.2.0/3.3.0

stat slot.s/ip/rte.m **source**

Value(s): direct, rip, static
Description: Indicates the origin of this routing table entry.
Direct Indicates this IP address represents and interface on the NetVX™.
Static Indicates a manually (statically) configured IP address.
RIP Indicates an entry automatically configured by the RIP protocol.
Intro/Update: 2.2.0/4.0.0

23.3.21 SYS, GBE IP Virtual Channel Status Parameters

stat slot.s/ip/vc.m

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

vc.m m = Virtual Circuit number.
- 0–255 Row number in the inverse ATM address resolution protocol (ARP) table.

Use these status parameters to access the slot–based ATM address resolution protocol (ARP) table.

Indicates the inverse ATM ARP IP address. When an IP virtual channel is configured for IPOA and connected to an ATM virtual channel, this value contains the remote host's IP address

stat slot.s/ip/vc.m **iaaaddr**

Value(s): Read Only
Description: Indicates the inverse ATM ARP IP address.
When an IP virtual channel is configured for IPOA and connected to an ATM virtual channel, this parameter indicates the remote host's IP address.
Intro/Update: 4.0.0/5.2.0

stat slot.s/ip/vc.m **rxcor**

Value(s): Read Only
Description: Maintains a count of corrected packets received on this VC.
Note: This parameter is only provided by the GBE-C11.
Intro/Update: 4.0.0/5.6.0

stat slot.s/ip/vc.m **rxdelayvar**

Value(s): Read Only
Description: Indicates the computed receive delay variation on this VC.
An idealized transmission medium delivers packets to the receiver with a consistent network delay. Any change between a packet's expected arrival time and the actual arrival time contributes to the delay variation. This value holds the maximum peak-to-peak change for the last second.
Note: This parameter is only provided by the GBE-C11.
Intro/Update: 5.6.0/5.6.0

stat slot.s/ip/vc.m **rxdis**

Value(s): Read Only
Description: Count seconds with at least one packet discard event on this VC.
The count includes cells discarded because they exceeded the input policing parameters on the VC. Packets that are discarded because they are fragmented do not contribute to this value.
Intro/Update: (Available in a future release)

stat slot.s/ip/vc.m **rxerrsec**

Value(s): Read Only

Description: Maintains a count of the number of consecutive seconds in which errored data are received on this VC. This count is initiated once stat slot.s/ip/vc.m rxtspres begins indicating “not present” and stat slot.s/ip/vc.m rxunc begins to increment.

Intro/Update: 4.0.0/4.0.0

stat slot.s/ip/vc.m **rxfecorder**

Value(s): Read Only

Description: Indicates the detected FEC order, or the number of rows, in the FEC grid. When a virtual channel is configured to carry MPEG with forward error correction, the FEC data are generated with stable characteristics. Zero is indicated if FEC is not being applied to the VC.

Note: This parameter is only provided by the GBE-C11.

Intro/Update: 5.6.0/5.6.0

stat slot.s/ip/vc.m **rxfecperiod**

Value(s): Read Only

Description: Indicates the detected FEC period, or the number of columns, in the FEC grid. When a virtual channel is configured to carry MPEG with forward error correction, the FEC data are generated with stable characteristics. Zero is indicated when FEC is not being applied to the VC.

Note: This parameter is only provided by the GBE-C11.

Intro/Update: 5.6.0/5.6.0

stat slot.s/ip/vc.m **rxfrag**

Value(s): Read Only

Description: Counts seconds with at least one discarded, fragmented packet received on this VC. When a channel is configured to carry MPEG, it should ensure that all logical packets fit in one transmission unit, without requiring fragmentation for network transmission. If the module discards a fragmented video-on-IP packet on this channel, it increments this value. This condition contributes to a VC degrade alarm.

Intro/Update: 4.0.0/4.0.0

stat slot.s/ip/vc.m **rxpayrate**

Value(s): Read Only

Description: Indicates the receive payload bitrate on this VC. This value gives the bitrate of data received from the external interface and directed to this VC. The conversion from IP rate to payload rate depends on the channel's configured function.

ipoa Indicates the IP packet data rate. The IP and payload rates are equivalent.

mpeg-rtp-rx The value indicates the transport stream rate, including null packets. All IP overhead bytes, including the RTP headers, are subtracted.

mpeg-ts-rx The value indicates the transport stream rate, including null packets. All IP overhead bytes, including the RTP headers, are subtracted.

Intro/Update: 4.0.0/4.0.0

stat slot.s/ip/vc.m **rxpkts**

Value(s): Read Only

Description: Maintains a count of the number of packets received on this VC.

Intro/Update: 4.0.0/4.0.0

stat slot.s/ip/vc.m **rxrate**

Value(s): Read Only

Description: Indicates the computed receive IP bitrate on this VC. This value gives the IP packet bandwidth, independent from the payload. Consequently, the system can monitor the incoming traffic without having to parse the data.

Intro/Update: 4.0.0/4.0.0

stat slot.s/ip/vc.m **rxtsperip**

Value(s): Read Only

Description: Indicates the detected number transport stream packets per IP packet received on this VC. When a channel carries MPEG, this value tells how many 188-byte transport stream packets reside in each IP packet.

If the channel does not carry MPEG or the value has not been determined, this value will be zero.

Intro/Update: 5.6.0/5.6.0

stat slot.s/ip/vc.m **rxtspkts**

Value(s): Read Only

Description: Maintains a count of the transport stream packets received on this interface.

Intro/Update: 4.0.0/4.0.0

stat slot.s/ip/vc.m **rxtspres**

Value(s): present, notpresent, unknown

Description: Indicates if a transport stream is being received on this interface.

present Indicates the system has detected at least three consecutive synchronization bytes (0x47) separated by 188 bytes.

notpresent Indicates the system has missed at least three consecutive synchronization bytes (0x47).

unknown Indicates that the VC is not configured to receive IP, and it is not carrying an MPEG transport stream.

Intro/Update: 4.0.0/4.0.0

stat slot.s/ip/vc.m **rxunc**

Value(s): present, notpresent, unknown

Description: Maintains a count of uncorrectable packets received on this VC.

Note: This parameter is only provided by the GBE-C11.

Intro/Update: 4.0.0/5.6.0

stat slot.s/ip/vc.m **txerrsec**

Value(s): present, notpresent, unknown

Description: Maintains a count of the number of consecutive seconds in which errored data transmitted over this VC. This count is initiated once stat slot.s/ip/vc.m txtspres begins indicating “not present”.

Intro/Update: 4.0.0/4.0.0

stat slot.s/ip/vc.m **txfailure**

Value(s): nofault, fault, unknown

Description: Indicates transmission failure on this VC. This failure is typically due to network conditions such as address resolution failure, receiver errors, etc. Check the alarm text for details regarding this failure.

nofault Transmission appears to be operating properly.

fault Transmission appears to be operating improperly.

unknown The module cannot determine status.

Intro/Update: 5.5.0/5.5.0

stat slot.s/ip/vc.m **txovf**

Value(s): Read Only

Description: Indicates the count of transmit overflow seconds on this VC. If the transmit buffer cannot send all of its pending data without exceeding the configured transmit rate, it drops packets. This variable increments once per second to record the overflow.

Intro/Update: 4.0.0/4.0.0

stat slot.s/ip/vc.m **txpayrate**

Value(s): Read Only

Description: Indicates the transmit payload bitrate on this VC. This value indicates the bitrate of data sent from this VC to and external interface The conversion from IP rate to payload rate depends on the channel's configured function.

ipoa Indicates the IP packet data rate. The IP and payload rates are equivalent.

mpeg-rtp-rx, mpeg-ts-rx The value indicates the transport stream rate, including null packets. All IP overhead bytes, including the RTP headers, are subtracted.

Intro/Update: 4.0.0/4.0.0

stat slot.s/ip/vc.m **txpkts**

Value(s): Read Only

Description: Maintains a count of the number of IP packets transmitted on this VC.

Intro/Update: 4.0.0/4.0.0

stat slot.s/ip/vc.m **txrate**

Value(s): Read Only

Description: Indicates the computed transmit IP bitrate on this VC. This value gives the IP packet bandwidth, independent from the payload. Consequently, the system can monitor the outgoing traffic without having to parse data.

Intro/Update: 4.0.0/4.0.0

stat slot.s/ip/vc.m **txtspkts**

Value(s): Read Only

Description: Maintains a count of the transport stream packets transmitted on this VC.

Intro/Update: 4.0.0/4.0.0

stat slot.s/ip/vc.m **txtspres**

Value(s): present, notpresent, unknown

Description: Indicates if a transport stream is being transmitted on this interface.

present Indicates the system has detected at least three consecutive synchronization bytes (0x47) separated by 188 bytes.

notpresent Indicates the system has missed either: (1) Three consecutive synchronization bytes (0x47), or (2) 1/30 of a second of transport stream. At such a point the system declares transport stream not present.

unknown Indicates that the VC is not configured to transmit IP, or it is not carrying an MPEG transport stream.

Note: This status parameter contributes to the VC Fault Alarm (cfg sys/alm vcFaultSev).

Intro/Update: 4.0.0/5.2.0

23.3.22 TMX Demux Status Parameters

stat slot.s/mux/dxifc.m

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dxifc.m m = Demux interface (dxifc) number (1–8). Specifies any one of the TMX module's eight internal demultiplexer (dx) interfaces

These parameters provide status for the TMX module's internal Demux interfaces.

stat slot.s/mux/dxifc.m **patversion**

Value(s): Read Only

Description: Indicates the PAT version number for the transport stream on this interface.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/dxifc.m **pgmmax**

Value(s): Read Only

Description: Indicates the maximum program table index for this interface.

Intro/Update: 3.1.0/4/0.0

stat slot.s/mux/dxifc.m **sipres**

Value(s): Read Only

Description: Indicates the presence of system information tables.

Intro/Update: 3.1.0/4/0.0

stat slot.s/mux/dxifc.m **tsid**

Value(s): Read Only

Description: Indicates the transport stream ID setting for the stream on this interface.

Intro/Update: 5.5.0/5.5.0

23.3.23 TMX Demux Program Status Parameters

stat slot.s/mux/dxifc.m/pgm.p

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dxifc.m m = Demux interface (dxifc) number (1–8). Specifies any one of the TMX module's eight internal demultiplexer (dx) interfaces

pgm.p p = Number of the program on this interface.

stat slot.s/mux/dxifc.m/pgm.p **descriptors**

Value(s): Read Only

Description: Contains the descriptors associated with this elementary stream. Every PMT elementary stream entry contains a variable-length block of descriptors, defined to carry auxiliary data. This value (also variable-length) is filled with a binary copy of the descriptors for this elementary stream in the PMT.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/dxifc.m/pgm.p **esmax**

Value(s): Read Only

Description: Indicates

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/dxifc.m/pgm.p **name**

Value(s): Read Only

Description: Indicates the name for this program, as obtained from the MPEG stream. Typically, this value is inserted by an encoder or another entity that creates transport streams.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/dxifc.m/pgm.p **pcrpid**

Value(s): Read Only

Description: Indicates the PID that carries this program's PCRs. If the program does not have PCRs, this parameter takes on the value 0x1fff.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/dxifc.m/pgm.p **pmtpid**

Value(s): Read Only

Description: Indicates the PID that carries this program's PMT. This field's interpretation depends on the program number.

Program Number equals Zero This parameter indicates the network PID, giving the PID of the transport stream packets that contain the Network Information Table. The presence of the network PID and the NIT is optional.

Non-Zero Program Number This paramter indicates the PID of the transport stream packets that contain the Program Map Table.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/dxifc.m/pgm.p **pmtversion**

Value(s): 0 to 31; Read Only

Description: Indicates the version number of this program's Program Map Table. This number changes whenever the PMT is updated.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/dxifc.m/pgm.p **prognum**

Value(s): Read Only

Description: Indicates the program number for the indexed PAT entry.

Intro/Update: 3.1.0/4/0.0

23.3.24 TMX Demux Program Elementary Stream Status Parameters

stat slot.s/mux/dxifc.m/pgm.p/es.e

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dxifc.m m = Demux interface (dxifc) number (1–8). Specifies any one of the TMX module's eight internal demultiplexer (dx) interfaces

pgm.p p = Number of the program on this interface.

es.e e = The number of the elementary stream within this program.

stat slot.s/mux/dxifc.m/pgm.p/es.e **esmax**

Value(s): Read Only

Description: Indicates the maximum elementary stream table index in this program.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/dxifc.m/pgm.p/es.e **espid**

Value(s): Read Only

Description: Indicates the elementary stream PID.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/dxifc.m/pgm.p/es.e **estype**

Value(s): Read Only

Description: Indicates the elementary stream's type. See Table 23.6.1, "Stream Types" on page 406 for details.

Intro/Update: 5.5.0/5.7.0

23.3.25 TMX Demux VC Status Parameters

stat slot.s/mux/dxvc.m

slot.s s = Slot number.
3–17 SYS-1700's range of application module slot numbers.
2–4 SYS-200/SYS-300's range of application module slot numbers.

dxvc.m m = Demux Virtual Channel (dxvc) number (1–63).

stat slot.s/mux/dxvc.m **dis**

Value(s): Read Only
Description: Provides a count of the number of packets discarded for this VC.
Intro/Update: 3.1.0/4/0.0

stat slot.s/mux/dxvc.m **failure**

Value(s): Read Only
Description: Indicates processing failure on this VC. When a VC is configured for special function processing, several conditions can cause a failure. If the module encounters processing errors, it will declare an alarm (vcDeg, transport stream errors). The utility clear command resets this value to noFault.
No Fault Indicates processing appears to be operating properly.
Fault Indicates the VC appears to be operating improperly.
Unknown Indicates the module cannot determine the status of this VC.
Intro/Update: 5.8.0/5.8.0

stat slot.s/mux/dxvc.m **pkts**

Value(s): Read Only
Description: Counts the packets received for this channel after policing.
Intro/Update: 3.1.0/3.1.0

stat slot.s/mux/dxvc.m **progpres**

Value(s): Read Only
Description: Indicates the presence of this channel's program.
Intro/Update: 3.1.0/4/0.0

stat slot.s/mux/dxvc.m **rate**

Value(s): Read Only
Description: Indicates the computed transport stream bitrate for this channel.
Intro/Update: 3.1.0/3.1.0

stat slot.s/mux/dxvc.m **siccerr**

Value(s): Read Only
Description: Counts the continuity counter errors in the system information tables.
Intro/Update: 3.1.0/4/0.0

stat slot.s/mux/dxvc.m **sicrcerr**

Value(s): Read Only

Description: Counts the CRC errors in the system and program information tables.

Intro/Update: 3.1.0/4/0.0

23.3.26 TMX Mux Status Parameters

stat slot.s/mux/mxifc.m

slot.s s = Slot number.

3–17 SYS-1700's range of application module slot numbers.

2–4 SYS-200/SYS-300's range of application module slot numbers.

mxifc.m m = Mux Virtual Channel (mxvc) number (1–63).

stat slot.s/mux/mxifc.m **crslcurrident**

Value(s): Read Only

Description: Identifies the interface's current data carousel file. This value is derived from the File Description descriptor in the carousel file. If no file has been loaded into the current carousel, this variable will be set to None. The state of the carousel streaming does not affect this variable.

Intro/Update: 5.0.0/5.0.0

stat slot.s/mux/mxifc.m **crslcurrstart**

Value(s): Read Only

Description: Indicates the start time of the interface's current data carousel file. The value is a text string, representing the designated date and time in ISO 8601 format. The time might be in the past or the future. If the carousel file does not have an Activation Time descriptor, the system uses the time at which the file became current. If no file has been loaded into the current carousel, this variable will be set to None. The state of the carousel streaming does not affect this variable.

Intro/Update: 5.0.0/5.0.0

stat slot.s/mux/mxifc.m **crslcurrlatepkts**

Value(s): Read Only

Description: Provides a count of late packets inserted from this interface's data carousel.

Note: The utility clear (util clear) command resets this value to zero.

Intro/Update: 5.0.0/5.0.0

stat slot.s/mux/mxifc.m **crslnextident**

Value(s): Read Only

Description: Identifies the interface's next data carousel file. This value is derived from the File Description descriptor in the carousel file. If no file has been loaded as the next carousel, this parameter indicates "none". The state of the carousel streaming does not affect this variable.

Intro/Update: 5.0.0/5.0.0

stat slot.s/mux/mxifc.m **crslnextstart**

Value(s): Read Only

Description: Indicates the start time of the interface's next data carousel file. The value is a text string, representing the designated date and time in ISO 8601 format. This value is determined from the file's Activation Time descriptor. If no file has been loaded as the next carousel, this variable will be set to None. The state of the carousel streaming does not affect this variable.

Intro/Update: 5.0.0/5.0.0

stat slot.s/mux/mxifc.m **crslpkts**

Value(s): Read Only

Description: Provides a count of packets inserted from this interface's data carousel.

Note: The utility clear (util clear) command resets this value to zero.

Intro/Update: 5.0.0/5.6.0

stat slot.s/mux/mxifc.m **crslrate**

Value(s): Read Only

Description: Indicates the computed transport stream bitrate for the interface's data carousel. Regardless of the configured bitrate, this value provides the actual rate at which carousel data are being inserted into the transport stream.

Intro/Update: 5.0.0/5.0.0

stat slot.s/mux/mxifc.m **crslstatus**

Value(s): Read Only

Description: Indicates the interface's data carousel status. In general terms, the module asserts this fault when it cannot process the input carousel file, or when the configuration/file parameters conflict, making carousel processing impossible.

fault Indicates that an error has occurred. The error may be triggered by any of the following conditions. This condition raises the “Network Degrade” alarm.

Format Corrupt – The carousel file has an internal error that violates the specified format. This can apply to the current, next, or update file.

Insufficient Bandwidth – The carousel's configured bitrate is too low to carry the data from the current file. Depending on the cycle times of the data being multiplexed into the transport stream, this condition may be temporary (a packet was sent later than its scheduled time) or permanent (the file has too much data for the allocated bandwidth).

PID Conflict – A data segment in the carousel file specified a PID that conflicts with another PID in the transport stream.

No File – If the carousel is configured to be active, a file should exist to be streamed. If no file has been provided in the appropriate directory, a fault will be asserted.

noFault Either the carousel has not been activated, or the carousel is operating normally.

unknown This value does not occur.

Intro/Update: 5.0.0/5.0.0

stat slot.s/mux/mxifc.m **patversion**

Value(s): Read Only

Description: Indicates the PAT’s version umber for this interface’s transport stream.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/mxifc.m **tsid**

Value(s): Read Only
Description: Indicates the transport stream ID for this interface.
Intro/Update: 5.5.0/5.5.0

23.3.27 TMX Mux Program Status Parameters

stat slot.s/mux/mxifc.m/pgm.p

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dxvc.m m = Demux Virtual Channel (dxvc) number (1–63).

pgm.p p = Number of the program on this interface.

stat slot.s/mux/mxifc.m/pgm.p **descriptors**

Value(s): Read Only
Description: Contains the descriptors associated with this program's PMT.
Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/mxifc.m/pgm.p **pgmname**

Value(s): Read Only
Description: Indicates the name for this program.
Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/mxifc.m/pgm.p **pcrpid**

Value(s): Read Only
Description: Indicates the PID that carries this program's PCRs. If the program does not have PCRs, this parameter takes on the value 0x1fff.
Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/mxifc.m/pgm.p **pmtpid**

Value(s): Read Only
Description: Indicates the PID that carries this program's PMT. This field's interpretation depends on the program number.

Program Number equals Zero This parameter indicates the network PID, giving the PID of the transport stream packets that contain the Network Information Table. The presence of the network PID and the NIT is optional.

Non-Zero Program Number This paramter indicates the PID of the transport stream packets that contain the Program Map Table.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/mxifc.m/pgm.p **pmtversion**

Value(s): 0 to 31; Read Only
Description: Indicates the version number of this program's Program Map Table. This number changes whenever the PMT is updated.
Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/mxifc.m/pgm.p **prognum**

Value(s): Read Only
Description: Indicates the program number for the indexed PMT entry.
Intro/Update: 5.5.0/5.5.0

23.3.28 TMX Mux Program Elementary Stream Status Parameters

stat slot.s/mux/mxifc.m/pgm.p/es.e

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

dxvc.m m = Demux Virtual Channel (dxvc) number (1–63).

pgm.p p = Number of the program on this interface.

es.e e = The number of the elementary stream in this program.

stat slot.s/mux/mxifc.m/pgm.p/es.e **descriptors**

Value(s): Read Only
Description: Contains the descriptors associated with this elementary stream.
Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/mxifc.m/pgm.p/es.e **pid**

Value(s): Read Only
Description: Indicates the elementary stream PID.
Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/mxifc.m/pgm.p/es.e **type**

Value(s): Read Only
Description: Indicates the elementary stream's type. See Table 23.6.1, "Stream Types" on page 406 for details.
Intro/Update: 5.5.0/5.7.0

23.3.29 TMX Mux VC Status Parameters

stat slot.s/mux/mxvc.m

slot.s s = Slot number.
3–17 SYS-1700's range of application module slot numbers.
2–4 SYS-200/SYS-300's range of application module slot numbers.

mxvc.m m = Mux Virtual Channel (mxvc) number (1–63).

stat slot.s/mux/mxvc.m **failure**

Value(s): Read Only
Description: Indicates processing failure on this VC. When a VC is configured for special function processing, several conditions can cause a failure. If the module encounters processing errors, it will declare an alarm (vcDeg, transport stream errors). The utility clear command resets this value to noFault.
No Fault Indicates processing appears to be operating properly.
Fault Indicates the VC appears to be operating improperly.
Unknown Indicates the module cannot determine the status of this VC.
Intro/Update: 5.8.0/5.8.0

stat slot.s/mux/mxvc.m **pkts**

Value(s): Read Only
Description: Counts the packets received for this channel after policing.
Intro/Update: 3.1.0/3.1.0

stat slot.s/mux/mxvc.m **progpres**

Value(s): Read Only
Description: Indicates the presence of this channel's program.
Intro/Update: 3.1.0/4/0.0

stat slot.s/mux/mxvc.m **rate**

Value(s): Read Only
Description: Indicates the computed transport stream bitrate for this channel.
Intro/Update: 3.1.0/3.1.0

stat slot.s/mux/mxvc.m **siccerr**

Value(s): Read Only
Description: Provides a count of continuity counter errors in the system information tables.
Intro/Update: 3.1.0/4/0.0

stat slot.s/mux/mxvc.m **sicrcerr**

Value(s): Read Only
Description: Provides a count of CRC errors in the system and program information tables.
Intro/Update: 3.1.0/4/0.0

23.3.30 TMX Rx Interface Status Parameters

stat slot.s/mux/rxifc.m

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

rxifc.m m = Receive interface (rxifc) number (1–2)
- rxifc.1 Specifies the TMX module's "In 1" ASI/310M receive interface.
- rxifc.2 Specifies the TMX module's "In 2" ASI/310M receive interface.

These parameters provide status for the TMX module's internal MUX interface.

stat slot.s/mux/rxifc.m **errsec**

Value(s): Read Only
Description: Indicates errored second count for the interface.
Intro/Update:3.1.0/3.1.0

stat slot.s/mux/rxifc.m **lineerr**

Value(s): Read Only
Description: Indicates the errored second count for line errors on this interface.
Intro/Update:3.1.0/3.1.0

stat slot.s/mux/rxifc.m **lof**

Value(s): Read Only
Description: Indicates loss of frame for the interface.
Intro/Update:3.1.0/3.1.0

stat slot.s/mux/rxifc.m **los**

Value(s): Read Only
Description: Indicates loss of signal for the interface.
Intro/Update:3.1.0/3.1.0

stat slot.s/mux/rxifc.m **patversion**

Value(s): Read Only
Description: Indicates the PAT version number for this interface's transport stream.
Intro/Update:5.5.0/5.5.0

stat slot.s/mux/rxifc.m **pkts**

Value(s): Read Only
Description: Counts the non-null transport stream packets on this interface.
Intro/Update:3.1.0/3.1.0

stat slot.s/mux/rxifc.m **rate**

Value(s): Read Only
Description: Indicates the computed transport stream bitrate for the specified receive interface.
Intro/Update:3.1.0/4/0.0

stat slot.s/mux/rxifc.m **sipres**

Value(s): Read Only
Description: Indicates the presence of system information tables.
Intro/Update:3.1.0/4/0.0

stat slot.s/mux/rxifc.m **standard**

Value(s): Read Only
Description: Indicates the standard of the active receive interface.
Intro/Update:3.1.0/4/0.0

stat slot.s/mux/rxifc.m **tsid**

Value(s): Read Only
Description: Indicates the transport stream ID of the stream on this interface.
Intro/Update:3.1.0/4/0.0

23.3.31 TMX Rx Interface Program Status Parameters

stat slot.s/mux/rxifc.m/pgm.p

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

rxifc.m m = Receive interface (rxifc) number (1–2)
- rxifc.1 Specifies the TMX module's "In 1" ASI/310M receive interface.
- rxifc.2 Specifies the TMX module's "In 2" ASI/310M receive interface.

pgm.p p = Number of the program on this interface.

stat slot.s/mux/rxifc.m/pgm.p **descriptors**

Value(s): Read Only
Description: Contains the descriptors associated with this program's PMT.
Intro/Update:5.5.0/5.5.0

stat slot.s/mux/rxifc.m/pgm.p **pgmname**

Value(s): Read Only
Description: Indicates the name for this program.
Intro/Update:5.5.0/5.5.0

stat slot.s/mux/rxifc.m/pgm.p **pcrpid**

Value(s): Read Only

Description: Indicates the PID that carries this program's PCRs. If the program does not have PCRs, this parameter takes on the value 0x1fff.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/rxifc.m/pgm.p **pmtpid**

Value(s): Read Only

Description: Indicates the PID that carries this program's PMT. This field's interpretation depends on the program number.

Program Number equals Zero This parameter indicates the network PID, giving the PID of the transport stream packets that contain the Network Information Table. The presence of the network PID and the NIT is optional.

Non-Zero Program Number This paramter indicates the PID of the transport stream packets that contain the Program Map Table.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/rxifc.m/pgm.p **pmtversion**

Value(s): 0 to 31; Read Only

Description: Indicates the version number of this program's Program Map Table. This number changes whenever the PMT is updated.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/rxifc.m/pgm.p **prognum**

Value(s): Read Only

Description: Indicates the program number for the indexed PAT entry.

Intro/Update: 4.0.0/4.0.0

23.3.32 TMX Rx Interface Program Elementary Stream Status

stat slot.s/mux/rxifc.m/pgm.p/es.e

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

rxifc.m m = Receive interface (rxifc) number (1–2)
- rxifc.1 Specifies the TMX module's "In 1" ASI/310M receive interface.
- rxifc.2 Specifies the TMX module's "In 2" ASI/310M receive interface.

pgm.p p = Number of the program on this interface.

es.e e = The number of the elementary stream in the program.

stat slot.s/mux/rxifc.m/pgm.p/es.e **descriptors**

Value(s): Read Only
Description: Contains the descriptors associated with this program's PMT.
Intro/Update:5.5.0/5.5.0

stat slot.s/mux/rxifc.m/pgm.p/es.e **pid**

Value(s): Read Only
Description: Indicates the elementary stream's PID.
Intro/Update:5.5.0/5.5.0

stat slot.s/mux/rxifc.m/pgm.p/es.e **type**

Value(s): Read Only
Description: Indicates the elementary stream's type. See Table 23.6.1, "Stream Types" on page 406 for details.
Intro/Update:5.5.0/5.7.0

23.3.33 TMX Tx Interface Status Parameters

stat slot.s/mux/txifc.m

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

txifc.m m = Transmit interface (txifc) number (1–2)
- txifc.1 Specifies the TMX module's "Out 1" ASI/310M transmit interface.
- txifc.2 Specifies the TMX module's "Out 2" ASI/310M transmit interface.

stat slot.s/mux/txifc.m **crslcurrident**

Value(s): Read Only

Description: Identifies the interface's current data carousel file. This value is derived from the File Description descriptor in the carousel file. If no file has been loaded into the current carousel, this variable will be set to None. The state of the carousel streaming does not affect this variable.

Intro/Update: 5.0.0/5.0.0

stat slot.s/mux/txifc.m **crslcurrstart**

Value(s): Read Only

Description: Indicates the start time of the interface's current data carousel file. The value is a text string, representing the designated date and time in ISO 8601 format. The time might be in the past or the future. If the carousel file does not have an Activation Time descriptor, the system uses the time at which the file became current. If no file has been loaded into the current carousel, this variable will be set to None. The state of the carousel streaming does not affect this variable.

Intro/Update: 5.0.0/5.0.0

stat slot.s/mux/txifc.m **crslcurrlatepkts**

Value(s): Read Only

Description: Provides a count of late packets inserted from this interface's data carousel.

Note: The utility clear (util clear) command resets this value to zero.

Intro/Update: 5.0.0/5.0.0

stat slot.s/mux/txifc.m **crslnextident**

Value(s): Read Only

Description: Identifies the interface's next data carousel file. This value is derived from the File Description descriptor in the carousel file. If no file has been loaded as the next carousel, this variable will be set to None. The state of the carousel streaming does not affect this variable.

Intro/Update: 5.0.0/5.0.0

stat slot.s/mux/txifc.m **crslnextstart**

Value(s): Read Only

Description: Indicates the start time of the interface's next data carousel file. The value is a text string, representing the designated date and time in ISO 8601 format. This value is determined from the file's Activation Time descriptor. If no file has been loaded as the next carousel, this variable will be set to None. The state of the carousel streaming does not affect this variable.

Intro/Update: 5.0.0/5.0.0

stat slot.s/mux/txifc.m **crslpkts**

Value(s): Read Only

Description: Provides a count of late packets inserted from this interface's data carousel.

Note: The utility clear (util clear) command resets this value to zero.

Intro/Update: 5.0.0/5.0.0

stat slot.s/mux/txifc.m **crslrate**

Value(s): Read Only

Description: Indicates the computed transport stream bitrate for the interface's data carousel. Regardless of the configured bitrate, this value provides the actual rate at which carousel data are being inserted into the transport stream.

Intro/Update: 5.0.0/5.0.0

stat slot.s/mux/txifc.m **crslstatus**

Value(s): Read Only

Description: Indicates the interface's data carousel status. In general terms, the module asserts this fault when it cannot process the input carousel file, or when the configuration/file parameters conflict, making carousel processing impossible.

fault Indicates that an error has occurred. The error may be triggered by any of the following conditions. This condition raises the “Network Degrade” alarm.

Format Corrupt – The carousel file has an internal error that violates the specified format. This can apply to the current, next, or update file.

Insufficient Bandwidth – The carousel's configured bitrate is too low to carry the data from the current file. Depending on the cycle times of the data being multiplexed into the transport stream, this condition may be temporary (a packet was sent later than its scheduled time) or permanent (the file has too much data for the allocated bandwidth).

PID Conflict – A data segment in the carousel file specified a PID that conflicts with another PID in the transport stream.

No File – If the carousel is configured to be active, a file should exist to be streamed. If no file has been provided in the appropriate directory, a fault will be asserted.

noFault Either the carousel has not been activated, or the carousel is operating normally.

Intro/Update: 5.0.0/5.0.0

stat slot.s/mux/txifc.m **errsec**

Value(s): Read Only

Description: Indicates errored second count for the interface.

Intro/Update: 3.1.0/4/0.0

stat slot.s/mux/txifc.m **ovf**

Value(s): Read Only

Description: Indicates the errored second count for transmit buffer overflow on this interface.

Intro/Update: 4.0.0/3.1.0

stat slot.s/mux/txifc.m **patversion**

Value(s): Read Only
Description: Indicates the PAT version number for this interface's transport stream.
Intro/Update:5.5.0/5.5.0

stat slot.s/mux/txifc.m **pkts**

Value(s): Read Only
Description: Counts the non-null transport stream packets on this interface.
Intro/Update:4.0.0/3.0.0

stat slot.s/mux/txifc.m **rate**

Value(s): Read Only
Description: Indicates the computed transport stream bitrate for the specified transmit interface.
Intro/Update:4.0.0/3.0.0

stat slot.s/mux/txifc.m **standard**

Value(s): Read Only
Description: Indicates the active transmit interface standard.
Intro/Update:3.1.0/4/0.0

stat slot.s/mux/txifc.m **tsid**

Value(s): Read Only
Description: Indicates the transport stream ID for this interface.
Intro/Update:5.5.0/5.5.0

23.3.34 TMX Tx Interface Program Status Parameters

stat slot.s/mux/txifc.m/pgm.p

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

txifc.m m = Transmit interface (txifc) number (1–2)
- txifc.1 Specifies the TMX module's "Out 1" ASI/310M transmit interface.
- txifc.2 Specifies the TMX module's "Out 2" ASI/310M transmit interface.

pgm.p p = Identifies the program number.

stat slot.s/mux/txifc.m/pgm.p **esmax**

Value(s): Read Only

Description: Indicates the number of elementary streams in the PMT; if "0" then this parameter indicates that the PMT is not available.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/txifc.m/pgm.p **name**

Value(s): Read Only

Description: Indicates the name for this program, as obtained from the MPEG stream. Typically, this value is inserted by an encoder or another entity that creates transport streams.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/txifc.m/pgm.p **pcrpid**

Value(s): Read Only

Description: Indicates the PID that carries this program's PCRs. If the program does not have PCRs, this parameter takes on the value 0x1fff.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/txifc.m/pgm.p **pmtpid**

Value(s): Read Only

Description: Indicates the PID that carries this program's PMT. This field's interpretation depends on the program number.

Program Number equals Zero This parameter indicates the network PID, giving the PID of the transport stream packets that contain the Network Information Table. The presence of the network PID and the NIT is optional.

Non-Zero Program Number This paramter indicates the PID of the transport stream packets that contain the Program Map Table.

Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/txifc.m/pgm.p **pmtversion**

Value(s): 0 to 31; Read Only
Description: Indicates the version number of this program's Program Map Table. This number changes whenever the PMT is updated.
Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/txifc.m/pgm.p **prognum**

Value(s): Read Only
Description: Indicates the program number for the indexed PAT entry.
Intro/Update: 3.1.0/4/0.0

23.3.35 TMX Tx Interface Program Elementary Stream Status Parameters

stat slot.s/mux/txifc.m/pgm.p/es.e

slot.s s = Slot number.
- 3–17 SYS-1700's range of application module slot numbers.
- 2–4 SYS-200/SYS-300's range of application module slot numbers.

txifc.m m = Transmit interface (txifc) number (1–2)
- txifc.1 Specifies the TMX module's "Out 1" ASI/310M transmit interface.
- txifc.2 Specifies the TMX module's "Out 2" ASI/310M transmit interface.

pgm.p p = Identifies the program number.

es.e e = Elementary stream number.

stat slot.s/mux/txifc.m/pgm.p/es.e **pid**

Value(s): Read Only
Description: Indicates the elementary stream's PID
Intro/Update: 5.5.0/5.5.0

stat slot.s/mux/txifc.m/pgm.p/es.e **type**

Value(s): Read Only
Description: Indicates the elementary stream's type. See Table 23.6.1, "Stream Types" on page 406 for details.
Intro/Update: 5.5.0/5.7.0

23.3.36 SYS General System Status Parameters

stat sys/gen

Use these status parameters to monitor general system state.

stat sys/gen **cfgseq**

Value(s): Read Only

Description: Indicates the current configuration sequence number. The configuration sequence number increments each time a change is made to the system configuration. The Vidiem™ Element Management System uses this number to track whether the configuration it last read is still the most current system configuration; otherwise Vidiem informs its users that this is not the case. Generally such a notification is the result of more than one user configuring the system at a time.

Intro/Update: 2.0.0/2.0.0

stat sys/gen **chassis**

Value(s): unknown, vr-200-ac, vr-300-ac, vr-350-ac, vr350-dc, vr-1700-ac, vr-1700-dc

Description: Indicates the chassis type.

unknown Unknown chassis type. Typically this reading is the result of an enclosure that has not been programmed.

vr-200-ac A 4-slot AC-powered enclosure. Slots are numbered 1 to 4. Slot 1 is reserved for an embedded system controller. Slots 2 is reserved for an embedded TMX module. Slots 3 and 4 may be populated with application modules.

vr-300-ac A 4-slot AC-powered enclosure. Slots are numbered 1 to 4. Slot 1 is reserved for an embedded system controller. Slots 2, 3, and 4 may be populated with application modules.

vr-350-ac A 4-slot AC-powered enclosure. Slots are numbered 1 to 4. Slot 1 is reserved for an embedded system controller. Slots 2, 3, and 4 may be populated with application modules.

vr-350-dc A 4-slot DC-powered enclosure. Slots are numbered 1 to 4. Slot 1 is reserved for an embedded system controller. Slots 2, 3, and 4 may be populated with application modules.

vr-1700-ac A 17-slot DC-powered enclosure. Slots are numbered 1 to 17. Slots 1 and 2 are reserved for the system controller modules.

vr-1700-dc A 17-slot DC-powered enclosure. Slots are numbered 1 to 17. Slots 1 and 2 are reserved for the system controller modules.

Intro/Update: 2.0.0/7.5.0

stat sys/gen **date**

Value(s): YYYY-MM-DD

Description: Indicates the system date (using ISO 8601 format).

Intro/Update: 2.0.0/2.0.0

stat sys/gen **eval**

Value(s): none

Description: Indicates the remaining evaluation time available for the current feature profile key.

Intro/Update: 4.0.0/4.0.0

stat sys/gen **fwbuild**

Value(s): text

Description: Indicates the firmware build ID. The value has the form YYWWMMMM, where YY is a two-digit year, WW is a two-digit week within the year (00–53), and MMMM is a 4-digit minute within the week. (A week has 10,080 minutes, so the program that creates the build string uses 60.48 seconds per “minute” to make an even, but slightly inaccurate, 10,000 minutes/week).

Intro/Update: 2.0.0/2.0.0

stat sys/gen **fwdate**

Value(s): text

Description: Indicates the date/time the firmware was built. The value is presented as a readable string, such as the output of the Unix date command. This variable contributes to identifying the firmware currently installed on the system.

Intro/Update: 2.0.0/2.0.0

stat sys/gen **fwident**

Value(s): text

Description: Internal Harris Corporation firmware identification number.

Intro/Update: 2.0.0/2.0.0

stat sys/gen **fwtitle**

Value(s): text

Description: Firmware title.

Intro/Update: 2.0.0/2.0.0

stat sys/gen **ledalarm**

Value(s): OFF, red, amber, green

Description: Indicates the state of the front panel’s “Alarm” led. See Section 22.8.3, "How to Diagnose the Source of Input Faults" on page 161 to learn how to get further details.

OFF Indicates the system is not receiving power.

red Indicates a module or a system sub-component is experiencing a fault and should be replaced or repaired.

amber Indicates a minor warning or alarm is active. This state may be triggered by any module degrade alarm

green Indicates no alarms are active.

Intro/Update: 2.0.0/2.0.0

stat sys/gen **ledinput**

Value(s): OFF, red, amber, green

Description: Indicates the state of the front panel’s “Input” led. See Section 22.8.3, "How to Diagnose the Source of Input Faults" on page 161 to learn how to get further details.

OFF Indicates the system is not receiving power, or none of the active application modules have inputs.

red Indicates a configured input is experiencing loss of signal or a loss of framing.

amber Indicates bit errors on an input.

green Indicates all enabled module input LEDs are green.

Intro/Update: 2.0.0/2.0.0

stat sys/gen **ledmodule**

Value(s): OFF, red, amber, green

Description: Indicates the state of the front panel's "Module" led. This LED provides an aggregate view of the state of all system modules. See Section 22.8.3, "How to Diagnose the Source of Input Faults" on page 161 to learn how to get further details.

OFF Indicates the system is not receiving power.

red Indicates a module fault is active. NOTE: The module fault may be the result of a system fault such as the loss of a power circuit.

amber Indicates any on of the module degradation alarms may be active.

green Indicates no module faults are present.

Intro/Update: 2.0.0/2.0.0

stat sys/gen **ledsystem**

Value(s): OFF, red, amber, green

Description: Indicates the state of the front panel's "System" LED. This LED provides an aggregate view of all system state. See Section 22.8.3, "How to Diagnose the Source of Input Faults" on page 161 to learn how to get further details.

OFF Indicates the system is not receiving power.

red Indicates the NetVX™ is out of service, or should be taken out of service because failure is imminent due to an internal controller, temperature, or power fault.

amber Indicates the system is booting, or if it has already booted, indicates a fan or power fault.

green Indicates the system is operating normally.

Intro/Update: 2.0.0/2.0.0

stat sys/gen **mfgdate**

Value(s): YYYY-MM-DD

Description: Indicates the chassis manufacture date.

Intro/Update: 2.0.0/2.0.0

stat sys/gen **model**

Value(s): unknown, vr-200-ac, vr-200-ac-std, vr-200-ac-ia, vr-200-ac-vi, vr-200-ac-ia-vi, vr-300-ac, vr-300-ac-std, vr-300-ac-ia, vr-300-ac-vi, vr-300-ac-ia-vi, vr-350-ac, vr-350-ac-std, vr-350-ac-ia, vr-350-ac-vi, vr-350-ac-ia-vi, vr-350-dc, vr-350-dc-std, vr-350-dc-ia, vr-350-dc-vi, vr-350-dc-ia-vi, vr-1700-ac, vr-1700-ac-std, vr-1700-ac-ia, vr-1700-ac-vi, vr-1700-ac-ia-vi, vr-1700-dc, vr-1700-dc-std, vr-1700-dc-ia, vr-1700-dc-vi, vr-1700-dc-ia-vi

Description: Indicates the chassis model and enabled software key.

Intro/Update: 2.0.0/7.5.0

stat sys/gen **refsource**

Value(s): ext-ntsc, ext-pal, int-ntsc, int-pal

Description: Indicates the condition of the reference signal source. Given a composite reference signal (sometimes called “black burst”), decoders and other equipment can lock their picture generation to the reference input. By synchronizing equipment to the same signal, a studio enables frame-accurate operations and avoids glitches in the broadcast signal.

This status value reflects both the configuration of the reference source and the condition of the input signal. When configured for an external signal, the supplied signal must match the expected frame rate to let the system synchronize its clock.

This status value affects the System Degrade reference error alarm.

ext-ntsc, ext-pal When the system is configured to receive an external reference signal, and the system successfully locks its clock to that signal, the status reflects the configured input. See none and notLocked below for further information.

int-ntsc, int-pal When the system is configured to use an internal reference clock, the status reflects the configured input.

none This status value occurs when an external signal is configured, but no signal is present on the reference input.

notLocked This status value occurs when an external signal is configured, a signal is detected on the reference input, but the system cannot lock to the signal's frame rate.

Intro/Update: 6.7.0/6.7.0

stat sys/gen **sernum**

Value(s): YYDVMMXXXXXX

Description: Indicates the chassis serial number.

YY Year

DV Internal identifier.

MM Month

XXXXXX Internal identifier.

Note: This format is subject to change.

Intro/Update: 2.0.0/4.0.0

stat sys/gen **time**

Value(s): hh:mm:ss

Description: Indicates the current time (in UTC).

Intro/Update: 2.0.0/2.0.0

stat sys/gen **version**

Value(s): text

Description: Identifies the version of firmware that the system is currently running.

Note: When stat slot.s/gen version command is used with the current system controller, is identical to stat sys/gen version.

Intro/Update: 2.0.0/2.0.0

23.3.37 IP Status Parameters

stat sys/ip/eth

Use these status parameters to monitor the state of the system controller's IP (Ethernet) port.

stat sys/ip/eth **link**

Value(s): 10BaseT, 10BaseT-half,
100BaseT, 100BaseT-half,
1000BaseT, 1000BaseT-half
lost, negotiating, optical, unknown

Description: Indicates the operational status of the Ethernet link.

10BaseT The interface has detected a 10BaseT signal (full duplex).

10BaseT-half The interface has detected a 10BaseT signal (half duplex).

100BaseT The interface has detected a 100BaseT signal (full duplex).

100BaseT-half The interface has detected a 100BaseT signal (half duplex).

1000BaseT The interface has detected a 1000BaseT signal (full duplex).

1000BaseT-half The interface has detected a 1000BaseT signal (half duplex).

lost The interface has lost link connectivity with its Ethernet.

negotiating Some interfaces can communicate at several speeds, and they often negotiate an acceptable speed with the device at the other end of the wire. This value indicates the startup negotiation is still in progress.

optical The interface has detected an optical signal.

unknown The interface status is unknown. This status is presented when the hardware does not respond to status requests. This state represents a temporary condition.

Note: This status parameter is identical to the stat slot.s/ip/ifc.m link.

Intro/Update: 2.0.0/5.6.0

stat sys/ip/eth **macaddr**

Value(s): xx.xx.xx.xx.xx.xx

Description: Indicates the NetVX™'s Ethernet MAC address.

Note: This status parameter is identical to the stat slot.s/ip/ifc.m macaddr.

Intro/Update: 2.0.0/2.0.0

23.3.38 General Purpose Input Status Parameters

stat sys/gpi.m

Use this status parameter to monitor the state of the NetVX™'s general purpose inputs (GPIs).

gpi.m m = GPI number (2–4) as numbered on the rear of the system.

stat sys/gpi.m **status**

Value(s): text

Description: Indicates the state of the specified GPI. The following example displays status for all GPIs.

```
ex:stat sys/gpi.* status
```

Intro/Update: 2.0.0/5.6.0

General Purpose Output Status Parameters

stat sys/gpo.m

Use these status parameters to monitor the state of the NetVX™'s general purpose outputs (GPOs).

gpo.m m = GPO number (2–4) as numbered on the rear of the system.

stat sys/gpo.m **fault**

Value(s): fault, nofault, unknown

Description: Indicates the fault state of the specified GPO. The following example displays the fault status for each of the system's GPOs.

```
ex:stat sys/gpo.* fault
```

Intro/Update: 2.0.0/2.0.0

stat sys/gpo.m **status**

Value(s): closed, open, unknown

Description: Indicates the state of the specified GPO relay. The following example displays state of each of the system's GPOs.

```
ex:stat sys/gpo.* status
```

Intro/Update: 2.0.0/2.0.0

23.3.39 Mechanical Status Parameters

stat sys/mech

Use these status parameters to monitor the state of the NetVX™'s mechanical sub-systems.

stat sys/mech **fan1Flt**

Value(s): fault, noFault

Description: Indicates fan 1 is experiencing a fault.

Note: Fan 1 is on the right side when looking at the system from the rear.

Intro/Update: 2.0.0/2.0.0

stat sys/mech **fan2Flt**

Value(s): fault, noFault
Description: Indicates fan 2 is experiencing a fault.
Note: Fan 2 is on the left side when looking at the system from the rear.
Intro/Update: 2.0.0/2.0.0

stat sys/mech **fpdFlt**

Value(s): fault, noFault
Description: Indicates the front panel is experiencing a critical fault.
Intro/Update: 2.0.0/2.0.0

stat sys/mech **pwr1Flt**

Value(s): fault, noFault
Description: Indicates power supply 1 is experiencing a fault.
Intro/Update: 2.0.0/2.0.0

stat sys/mech **pwr1Pres**

Value(s): present, notPresent
Description: Indicates the presence of power supply 1.
Intro/Update: 2.0.0/4.0.0

stat sys/mech **pwr2Flt**

Value(s): fault, noFault
Description: Indicates power supply 2 is experiencing a fault.
Intro/Update: 2.0.0/2.0.0

stat sys/mech **pwr2Pres**

Value(s): present, notPresent, unknown
Description: Indicates the presence of power supply 2.
Intro/Update: 2.0.0/2.0.0

stat sys/mech **temp**

Value(s): -128 to 127
Description: Indicates the system's internal temperature in degrees Celsius.
Intro/Update: 2.0.0/2.0.0

stat sys/mech **volt1Flt**

Value(s): fault, noFault
Description: Indicates +3V Power fault.
Intro/Update: 2.0.0/2.0.0

stat sys/mech **volt2Flt**

Value(s): fault, noFault
Description: Indicates +5V Power fault.
Intro/Update: 2.0.0/2.0.0

stat sys/mech **volt3Flt**

Value(s): fault, noFault
Description: Indicates +12V Power fault.
Intro/Update: 2.0.0/2.0.0

stat sys/mech **volt4Flt**

Value(s): fault, noFault
Description: Indicates -12V Power fault.
Intro/Update: 2.0.0/2.0.0

23.3.40 Serial Port Status Parameters

stat sys/ser.m

ser.m m = Serial port number (1–2) as numbered on the rear of the system.
1 COM1
2 COM2

stat sys/ser.m **mode**

Value(s): rs-232, rs-422
Description: Identifies the current mode of operation for the specified system controller serial port.
Intro/Update: 2.0.0/3.0.0

stat sys/ser.m **rxchars**

Value(s): count
Description: Maintains a count of characters received by this serial port from external equipment.
Use this parameter to verify that the interface is receiving characters from an external piece of equipment.
Intro/Update: 5.6.0/5.6.0

stat sys/ser.m **rxipchars**

Value(s): count
Description: Maintains a count of characters received by this serial port from external equipment and transmitted using UDP or Telnet. This value will always be equal to or less than stat sys/ser.m rxchars .
Use this command in conjunction with stat sys/ser.m rxchars to verify that all characters received by the serial interface are being transmitted via either the UDP or telnet interface.
Intro/Update: 5.6.0/5.6.0

stat sys/ser.m **state**

Value(s): active, connected, waiting

Description: Indicates the functional state of the serial port. This value depends on the port's configured function and tells what the application is doing.

active The function is active. This value applies to all functions except telnet.

connected This function applies to the telnet function and indicates a session is in progress.

waiting This function applies to the telnet function and indicates the listener is waiting for a connection to be established. No telnet session currently exists.
This value indicates the state of the application, but it does not give information about character input or output. The state could be active with no characters being transmitted or received.

Intro/Update: 5.6.0/5.6.0

stat sys/ser.m **txchars**

Value(s): count

Description: Maintains a count of characters transmitted from this serial port to external equipment.
This value will always be equal to or less than stat sys/ser.m txipchars.

Intro/Update: 5.6.0/5.6.0

stat sys/ser.m **txipchars**

Value(s): count

Description: Maintains a count of characters received over UDP or Telnet and transmitted from this serial port to external equipment.

Intro/Update: 5.6.0/5.6.0

23.4 Alarm Status Commands

Alarm commands summarize information also available through Status Commands. Many individual status items report errors or unexpected conditions. When such conditions occur, the system generates an alarm to notify the operator. To diagnose a problem or to view operational details, one could use the alarm commands.

23.4.1 Alarm Status Parameters

alm

alm **clear**

Value(s): all, hist, log

Description: Clears alarms in the specified area.

all Clears both the alarm history and the alarm log.

```
ex:alm clear all
```

hist Clears only alarm history by setting all entries to “noAlarm”.

```
ex:alm clear hist
```

log Clears all entries from the alarm log file.

```
ex:alm clear log
```

Intro/Update: 2.0.0/2.0.0

alm **cur**

Value(s): NONE

Description: This command displays all currently asserted alarms and associated information such as alarm type, location information, severity, and a description of the condition. The following command returns a table similar to the table shown below.

```
alm cur
Severity    Type        Location    Description Tag
Critical    netFlt      5.1.1       Audio LOS   NY-to-LA
Major       vidFlt      6.1.1       Video LOS   CBS-HD
```

Intro/Update: 2.0.0/2.0.0

alm **hist**

Value(s): <blank>, <item>

Description: This branch displays all types of alarm types that have occurred. This branch displays the alarm history group. Items in the group correspond to the system's alarm types. Whenever an alarm occurs, the item for its type is set to alarm. ONce set to alarm, an item stays that way, even if the alarm instance expires.

<blank> Use this option to display all alarms that have occurred.

```
ex:alm hist
```

<item> Use this option to specify and view history of any item shown in the list below.

```
ex:alm hist auddeg
```

audDeg Indicates the state of audio degrade alarms.

audFlt Indicates the state of audio fault alarms.

decDeg Indicates the state of decoder degrade alarms.

modDeg Indicates the state of module degrade alarms.

modFlt Indicates the state of module fault alarms.

netDeg Indicates the state of network degrade alarms.

netFlt Indicates the state of network fault alarms.

srvDeg Indicates the state of service degrade alarms.

srvFlt Indicates the state of service fault alarms.

sysDeg Indicates the state of system degrade alarms.

sysFlt Indicates the state of system fault alarms.

vancDeg Indicates the state of VANC degrade alarms.

vbiDeg Indicates the state of VBI degrade alarms.

vcDeg Indicates the state of VC degrade alarms.

vdFlt Indicates the state VD Fault alarms.

vidDeg Indicates the state of video degrade alarms.

vidFlt Indicates the state of video fault alarms.

Intro/Update: 2.0.0/2.0.0

alm **log**

Value(s): <blank>

Description: This branch displays the alarm log. When the system asserts (or negates) an alarm, it records the event in a log. The log itself has a fixed length. As new entries arrive, old entries depart. The report has the overall content shown below. The most recent item is displayed first.

```
ex:alm log
```

The alarm log appears as a table similar to the following.

```
2002-03-04 14:25:26ClearvidFlt      6.1.1       Loss of videoCBS-HD
2002-03-04 14:25:25ClearnetFlt      5.1.1       Loss of inputNY2LA
2002-03-04 14:23:15MajorvidFlt      6.1.1       Loss of videoCBS-HD
2002-03-04 14:23:13CriticalnetFlt   5.1.1       Loss of videoCBS-HD
```

Intro/Update: 2.0.0/2.0.0

23.5 Utility Command

Utility parameters provide control over basic system functions such as firmware version and upgrades, module failover and failback, and configuration, password, module profile, and alarm management.

23.5.1 Utility Parameters

util

util **clear**

Value(s): sys, slot.s

Description: This command clears error counts and status values for the specified item.

sys Clears all system status.

```
ex:util clear sys
```

slot.s Clears status for the module in the specified slot.

```
ex:util clear slot.14
```

Intro/Update: 2.0.0/2.0.0

util **community**

Value(s): public, <string>

Description: Use this parameter to enter the SNMP community string. The community string provides a mild form of security for SNMP communications. This form of security requires identical strings on the NetVX™ and in the Vidiem™ Element Management System's "Device Profile" in order permit SNMP communication between the two.
The community string is configured in the using the craft port, telnet, front panel, or HTTP interfaces. In the Vidiem™ Element Management System, the community string is configured in the "Device Profile Dialog". The community string that resides on the NetVX™ cannot be configured remotely using SNMP interfaces such as the Vidiem™ Element Management System or SNMP-based machine control.

public This is the default community string for all NetVX™ devices and for all Vidiem™ Element Management System device profiles.

<string> Any case-sensitive string of up to 31 non-null characters.

Intro/Update: 5.7.0/5.7.0

util **date**

Value(s): yyyy-mm-dd

Description: Use this command to set the current date in UTC, using the ISO 8601 format.

```
ex:util date 2003-05-13
```

Intro/Update: 2.0.0/2.0.0

util **delete**

Value(s): 1–99, <blank>

Description: Use this command to delete any system configuration.

1–99 Delete the specified system configuration on the system's internal disk under the specified numeric index.

```
ex:util delete 12
```

<blank> Lists saved configurations, including their numbers and names.

```
ex:util delete
```

Intro/Update: 2.0.0/2.0.0

util **failback**

Value(s): slot.s, xc.m

Description: Use this command after a module or a cross connection failover to manually return service to the original module or cross connection.

slot.s Specifies the module to which service shall be transferred; this is the module that originally carried the service.

```
ex:util failback slot.14
```

xc.m Specifies the cross connection to which service shall be transferred. This is typically the cross connection that originally carried the service. This cross connection must be configured as a "backup" (see cfg sys/xc.m rowstate).

```
ex:util failback xc.12
```

Note 1: Module Failback Prerequisites:
The module in "slot.s" must be configured as a protection module.
The module in "slot.s" must be carrying the service of a failed module.
The module currently in the failed slot must be same type as the protection module in slot *s*.
The original main module must be in service.

Note 2: Cross Connection Failback Prerequisites:
There must be an "active" cross connection with a matching destination.
The source of this "active" cross connection must not have any active alarms.

Intro/Update: 2.2.0/5.6.0

util **failover**

Value(s): slot.s, xc.m

Description: Use this command to manually transfer service to a backup module or backup cross connection.

slot.s Specifies the main module currently responsible for the service. Once this command is issued, service fails over to this module's backup module.

```
ex:util failover slot.12
```

xc.m Specifies the cross connection currently responsible for the service. Once this command is issued, service fails over to this cross connection's backup.

```
ex:util failover xc.12
```

Note 1: Module Failover Prerequisites:
The module in "slot.s" must have a configured protection module.
The protection module must be compatible with the module it is protecting (same type, model, etc.).
The protection module must be configured for protection mode.

Note 2: Cross Connection Failback Prerequisites:
The specified cross connection must have a configured backup cross connection.
The source of the backup cross connection must not have any active alarms.

Intro/Update: 2.2.0/5.6.0

util **firmware**

Value(s): <blank>, <version>

Description: This command manages the system's firmware.

<blank> Use this option to list all firmware versions that are currently installed on the system. Each firmware version listed may display none, one, or more of the following additional descriptors.

current	Identifies the firmware version currently in use.
previous	Identifies the firmware version previously in use.
booted	Identifies the firmware version that the system last booted with.
pending	Identifies the firmware version that the system will next boot with.

```
ex:util firmware
```

<version> Use this option to specify the firmware version that the system will next boot with. This command verifies the specified firmware version to ensure it is acceptable for use. If deemed acceptable, the specified firmware version is put in the "pending" state which queues it become the "current" firmware version the next time the system is reset. If the specified firmware version is not deemed acceptable, then an error message is returned.

Use util reset or a power cycle to make this firmware active.

```
ex:util firmware 1.1.0
```

Intro/Update: 2.0.0/2.0.0

util **ip update**

Value(s): None

Description: Use this command to simultaneously make active any changes to the system's IP address, gateway IP address, and IP subnet mask (cfg sys/ip/eth ipaddr, cfg sys/ip/eth ipgate, and cfg sys/ip/eth ipmask). This command is provided to ensure that changes to these interdependent communication settings are made simultaneously.

Intro/Update: 2.0.0/2.2.0

util **key**

Value(s): slot.s, sys, <key>

Description: Initiates a software key update. A software key holds information that lets the system change a module's Feature Profile, a system's chassis type, or the amount of a system's remaining evaluation time. Keys are generated for a specific unit and are identified by system serial number or module serial number. Accordingly, the key must be applied to that specific unit.

slot.s Specifies the slot receiving the key.

```
ex:util key slot.14 A98-3EB-52F-7
```

sys Specifies the system receives the key.

```
ex:util key sys A98-3EB-52F-7
```

<key> Specifies the feature profile key string.

```
ex:util key A98-3EB-52F-7
```

Intro/Update: 4.0.0/4.0.0

util **load**

Value(s): 0, 1 to 99

Description: Use this command to load a specific system configuration.

0 Loads the factory default system configuration. This special-case configuration number automatically matches the system's configuration to the installed hardware, and clears all tables, sets values to their defaults, and configures each slot to contain the module actually present.

```
ex:util load 0
```

1 to 99 Loads a user-defined system configuration.

```
ex:util load 17
```

Note: The IP address, gateway IP address, and IP subnet mask (cfg sys/ip/eth ipaddr, cfg sys/ip/eth ipgate, and cfg sys/ip/eth ipmask) are excluded from all system configurations (0–99). These settings are maintained in the system's non-volatile memory to prevent a disruption of service when a new configuration is loaded. The util ip update command updates changes to these settings.

Intro/Update: 2.0.0/2.0.0

util **merge**

Value(s): 1 to 99

Description: Merges a user-defined system configuration into the current configuration. Parameters not included in the configuration are not reset to defaults, as they are with **util load**. This permits the loading of partial configurations that change only a few parameters.

Note: The IP address, gateway IP address, and IP subnet mask cfg sys/ip/eth ipaddr, cfg sys/ip/eth ipgate,, and cfg sys/ip/eth ipmask) are excluded from all system configurations (0-99). These settings are maintained in the system's non-volatile memory to prevent a disruption of service when a new configuration is loaded. The **util ip** update command updates changes to these settings.

Intro/Update: 8.6

util **password**

Value(s): <new pwd>

Description: Use this command to specify a new password. The NetVX™ provides password protection for telnet access to the system. The NetVX™ is shipped with the following default login and password.

Login: admin

Password: admin

Note: If the NetVX™'s password is changed from the default setting (above), you will be prompted for the new password when using telnet, and also when upgrading the system using the Upgrade.exe utility.

<new pwd> Any string of letters and numbers without spaces or punctuation.

```
ex:util password rabbithole
```

Intro/Update: 2.0.0/2.0.0

util **profile**

Value(s): load, save, delete, <profile 1–99>, <branch>

Description: Use this command to create and manage configuration tree branch profiles. A profile is simply a snapshot of all settings in a specified branch. While util profile specifies the branch to profile, and the index number to save the profile under, cfg slot.s/gen cfgTag supplies a tag to name the profile.

save Use this argument to copy all settings from a branch of the configuration tree.

This example saves all slot settings cfg slot.s/gen and those of the installed application module.

```
ex:util profile save 10 slot.3
```

This example saves only encoder settings.

```
ex:util profile save 13 slot.3/enc.1
```

This example saves only audio 1 encoder settings.

```
ex:util profile save 13 slot.3/enc.1/aud.1
```

load Use this argument to load settings from a profile to a specified branch of the configuration tree. This command can be used repeatedly to load the same profile to different, same-type branches.

```
ex:util profile load 10 slot.7
ex:util profile load 13 slot.5/enc.1/aud.1
```

delete Use this argument to delete a profile. Profiles can also be overwritten/reused by doing a save and using the same index number.

```
ex:util profile delete 13
```

<1–99> Index number of the profile.

<branch> Identifies the branch of the configuration tree to copy (save) or write (load). See the above arguments for examples.

Note: The Vidiem™ Element Management System implements this feature at the module level. As such, encoder and decoder profiles are saved in their entirely. This command affords users finer granularity over the scope of the branch selected.

Intro/Update: 4.0.0/4.0.0

util **reset**

Value(s): sys, slot.s

Description: Use this command to reset the system or a specified module.

sys Resets the system. Firmware loaded using util firmware is made the active firmware upon system reset.

```
ex:util reset sys
```

slot.s Resets the module in slot.s (s = slot number).

```
ex:util reset slot.10
```

Intro/Update: 2.0.0/2.0.0

util **save**

Value(s): 1–99, 1–99 <name>, <blank>

Description: Use this command to save and manage system configurations.

1–99 Saves the current system configuration to the specified index number on the system's internal disk. The tag specified by the cfg sys/gen cfgtag command provides the name of this configuration.

```
ex:util save 12
```

1–99
<name> Saves the current system configuration and configuration name to the specified index number on the system's internal disk.

```
ex:util save 12 NYC43
```

<blank> Lists saved configurations, including their numbers and names.

```
ex:util save
```

Intro/Update: 2.0.0/5.5.0

util **time**

Value(s): hh:mm:ss

Description: Use this command to set the current time in UTC, using the ISO 8601 format.

hh:mm:ss Use this option to set the current time.

```
ex:util time 15:30:52
```

Intro/Update: 2.0.0/2.0.0

23.6 Reference Tables

23.6.1 Stream Types

The following parameters provide a number representing stream type. This number represents an entry for a stream type in Table 23-22, "Stream Types" on page 406.

- stat slot.s/mux/rxifc.m/pgm.p/es.e type
- stat slot.s/mux/txifc.m/pgm.p/es.e type
- stat slot.s/mux/dxifc.m/pgm.p/es.e estype
- stat slot.s/mux/mxifc.m/pgm.p/es.e type

Table 23-22 Stream Types

Type (number)	Type
1	Video
2	Constrained-Parameter Video Stream
3	Audio
4	Audio
5	Private Sections
6	PES Packets Containing Private Data
7	MHEG
8	Annex A – DSN CC
9	ITU-T Rec. H.222.1
10	Multi-Protocol Encapsulation
11	DSM-CC U-N Messages
12	DSM-CC Stream Descriptors
13	DSM-CC Sections (any type, including private data)
14	Auxiliary
15–127	Reserved
128–255	User Private

23.7 How to Configure the NetVX™'s Data Carousel

Use the NetVX™'s Data Carousel feature to multiplex PSIP data into any transport stream created by the TMX-M12 module's mux (cfg slot.s/mux/mxifc.m) or transmit (cfg slot.s/mux/txifc.m) interfaces.

23.7.1 How to Configure Carousel Directories and Files

Abstract: *Use this procedure to configure and prove-out an approach and directory structure for handling carousel files. Once completed, use the paths specified to configure a PSIP server, FTP server, or an automation control system, to automatically FTP carousel files to the NetVX™.*

1 Select "Modules > (right click) Properties" in the navigation tree.

2 Install the TMX-M12 module and configure any Mux or Transmit interfaces, Mux VCs, etc. as desired.

3 Establish an FTP connection to the NetVX™.

ftp <ip address>

ex: `ftp 10.40.150.101`

4 Log into the system's carousel directory using the following (fixed) username and password.

login: carousel

password: carousel

5 Use the 'mkdir' command to create directories to receive the carousel files. The created directory structure must have two levels.

- The parent-level directory is named after the slot (see example below) in which the TMX-M12 is located.
- The child-level directory is named after the interface used to stream the PSIP files.

5a Use the MKDIR command with a full path to simultaneously create a directory for the slot in which the TMX-M12 is located, and a nested directory for the interface.

Note: Note the expression used for each type of interface below and in the following steps.

ftp> mkdir slot<3-17>/mxifc<1-8>

ex: `ftp> mkdir slot5/mxifc7`

ftp> mkdir slot<3-17>/txifc<1-2>

ex: `ftp> mkdir slot5/txifc2`

6 Create one or more PSIP files using a third-party PSIP server.

7 The carousel file is binary, so before each transfer, be sure to configure the FTP client to operate in binary mode.

ftp> bin

8 For each PSIP file, use the FTP 'put' command to manually copy the file(s) to the NetVX™ directory associated with the desired interface.

ftp> put <localdirname>/<filename> slot<3-17>/mxifc<1-8>/<filename>

ex: `ftp> put c:/carouselfiles/monday.tmp slot5/mxifc7/monday.tmp`

ftp> put <localdirname>/<filename> slot<3-17>/txifc<1-2>/<filename>

ex: `ftp> put c:/carouselfiles/monday.tmp slot5/txifc2/monday.tmp`

9 Use the "ls" command and the full path to verify file are located in the desired directory.

ftp> ls slot<3-17>/mxifc<1-8>

ex: `ftp> ls slot5/mxifc7`

ftp> ls slot<3-17>/txifc<1-2>

ex: `ftp> ls slot5/txifc2`

10 Rename the carousel file to 'update.bin' to make it active.

ftp> rename slot<3-17>/mxifc<1-8> <filename.bin> update.bin

ex: `ftp> rename slot5/mxifc7/monday.tmp update.bin`

ftp> rename slot<3-17>/txifc<1-2> <filename.bin> update.bin

ex: `ftp> rename slot5/txifc2/monday.tmp update.bin`

About once a minute, the system checks for any file named ‘update’ in the carousel directory. When such a file is located, the system validates the file. If the file is valid, it is renamed to ‘next’ and read into memory. Upon reaching the ‘next’ file’s start time, the ‘current’ file is deleted. The ‘next’ file is renamed to ‘current’ and is multiplexed into the transport stream. See the next section for details on configuring the carousel.

23.7.2 How to Enable the Data Carousel for Operation

1 Set the rate for carousel streaming (in Mbps).

cfg slot.s/mux/txifc.m crslrate=<*rate*>

ex: `cfg slot.5/mux/mxifc.7 crslrate=1.5`

cfg slot.s/mux/txifc.m crslrate=<*rate*>

ex: `cfg slot.5/mux/txifc.2 crslrate=1.5`

2 Enable the carousel streaming on the desired interface.

cfg slot.s/mux/mxifc.m crslstream=*enable*

ex: `cfg slot.5/mux/mxifc.7 crslstream=enable`

cfg slot.s/mux/txifc.m crslstream=*enable*

ex: `cfg slot.5/mux/txifc.2 crslstream=enable`

Chapter 24: Craft Port Command Quick Reference

24

24.1 Overview

This chapter provides a summary of the NetVX™'s craft port commands and configuration parameters. These entries provide the command path, configuration parameter, release introduced/release last updated, and page number.

In the PDF version of this document, these entries each act as a hyperlink to the respective command description in Chapter "23" on page 163.

Command Path and Configuration Parameter	Release Introduced/Updated	Page #
cfg slot.s/atm/ifc.m bitslbo	6.7.0/8.1.1	163
cfg slot.s/atm/ifc.m bitsstandard	6.7.0/6.7.0	163
cfg slot.s/atm/ifc.m clock	2.0.0/6.7.0	164
cfg slot.s/atm/ifc.m ds3lbo	2.0.0/4.0.0	164
cfg slot.s/atm/ifc.m loop	2.0.0/2.0.0	164
cfg slot.s/atm/ifc.m mode	2.0.0/5.6.0	164
cfg slot.s/atm/ifc.m netDeg	2.0.0/2.0.0	164
cfg slot.s/atm/ifc.m netFlt	2.0.0/2.0.0	165
cfg slot.s/atm/ifc.m protnetFlt	5.6.0/5.6.0	165
cfg slot.s/atm/ifc.m standard	2.2.0/3.3.0	165
cfg slot.s/atm/ifc.m tag	2.0.0/2.0.0	165
cfg slot.s/atm/ifc.m txrate	2.0.0/2.0.0	166
cfg slot.s/atm/ifc.m rxpathtraceexp	8.1.1/8.1.1	166
cfg slot.s/atm/ifc.m txpathtrace	8.1.1/8.1.1	166
cfg slot.s/atm/ifc.m/rxrtr in	2.2.0/3.3.0	167
cfg slot.s/atm/ifc.m/rxrtr lvl	2.2.0/3.3.0	167
cfg slot.s/atm/ifc.m/rxrtr out	2.2.0/3.3.0	167
cfg slot.s/atm/ifc.m/txrtr in	2.2.0/3.3.0	167
cfg slot.s/atm/ifc.m/txrtr lvl	2.2.0/3.3.0	167
cfg slot.s/atm/ifc.m/txrtr out	2.2.0/3.3.0	168
cfg slot.s/atm/ipp.m port	(Available in a future release)	169
cfg slot.s/atm/ipp.m vc	(Available in a future release)	169
cfg slot.s/atm/vc.m copyvc	3.1.0/3.1.0	169
cfg slot.s/atm/vc.m function	2.0.0/6.1.0	171
cfg slot.s/atm/vc.m ifc	2.0.0/4.0.0	171
cfg slot.s/atm/vc.m lis	2.0.0/4.0.0	171
cfg slot.s/atm/vc.m mpegaal5size	2.0.0/5.7.0	171
cfg slot.s/atm/vc.m mpegproc	2.0.0/5.8.0	172
cfg slot.s/atm/vc.m rowstate	2.0.0/2.0.0	172
cfg slot.s/atm/vc.m rxrate	2.0.0/6.5.0	172
cfg slot.s/atm/vc.m tag	2.0.0/2.0.0	173
cfg slot.s/atm/vc.m txpriority	2.2.0/3.3.0	173
cfg slot.s/atm/vc.m txrate	2.0.0/2.0.0	173
cfg slot.s/atm/vc.m vcdeg	2.0.0/2.0.0	173
cfg slot.s/atm/vc.m vcflt	6.5.0/6.5.0	173
cfg slot.s/atm/vc.m vci	2.0.0/2.0.0	174
cfg slot.s/atm/vc.m vpi	2.0.0/2.0.0	174
cfg slot.s/dec.m/pgm bissesw	5.7.0/5.7.0	174
cfg slot.s/dec.m/pgm bissid	5.7.0/5.7.0	175

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cfg slot.s/dec.m/pgm decDeg 2.0.0/2.0.0 175
cfg slot.s/dec.m/pgm reference 6.5.0/6.5.0 176
cfg slot.s/dec.m/pgm prognum 2.0.0/7.0.0 176
cfg slot.s/dec.m/pgm tag 2.0.0/2.0.0 176
cfg slot.s/dec.m/aud.n channel 6.5.1/6.5.1 177
cfg slot.s/dec.m/aud.n delay 2.0.0/4.0.0 177
cfg slot.s/dec.m/aud.n outlvl 5.0.0/5.0.0 177
cfg slot.s/dec.m/aud.n passthrough 2.2.0/4.0.0 178
cfg slot.s/dec.m/aud.n source 2.0.0/4.0.0 178
cfg slot.s/dec.m/aud.n/rtr in 2.2.0/3.3.0 178
cfg slot.s/dec.m/aud.n/rtr lvl 2.2.0/3.3.0 178
cfg slot.s/dec.m/aud.n/rtr out 2.2.0/3.3.0 179
cfg slot.s/dec.m/vbi * vbideg 4.0.0/4.0.0 179
cfg slot.s/dec.m/vbi/fld.f/lin.l override 4.0.0/4.0.0 180
cfg slot.s/dec.m/vbi/fld.f/lin.l testPattern 4.0.0/5.2.0 180
cfg slot.s/dec.m/vbi/fld.f/lin.l videoindex 7.2.0/7.2.0 181
cfg slot.s/dec.m/vid aspect 5.7.0/7.2.0 182
cfg slot.s/dec.m/vid noInput 2.0.0/2.0.0 182
cfg slot.s/dec.m/vid offset 2.0.0/7.0.0 183
cfg slot.s/dec.m/vid osd 2.0.0/2.0.0 183
cfg slot.s/dec.m/vid osdname 2.0.0/2.0.0 183
cfg slot.s/dec.m/vid osdpattern 2.0.0/5.2.0 183
cfg slot.s/dec.m/vid osdStat 2.0.0/2.0.0 183
cfg slot.s/dec.m/vid osdtext 2.0.0/2.0.0 183
cfg slot.s/dec.m/vid standard 2.0.0/5.0.0 184
cfg slot.s/dec.1/vid/rtr in 2.2.0/3.3.0 185
cfg slot.s/dec.1/vid/rtr lvl 2.2.0/3.3.0 185
cfg slot.s/dec.1/vid/rtr out 2.2.0/3.3.0 185
cfg slot.s/enc.m/aud.n auddeg 2.0.0/2.0.0 186
cfg slot.s/enc.m/aud.n audflt 2.0.0/2.0.0 186
cfg slot.s/enc.m/aud.n channel 6.5.0/6.5.1 186
cfg slot.s/enc.m/aud.n delay 2.0.0/7.2.0 187
cfg slot.s/enc.m/aud.n embedchan 2.2.0/3.3.0 187
cfg slot.s/enc.m/aud.n embedgroup 2.2.0/3.3.0 187
cfg slot.s/enc.m/aud.n gain 2.0.0/4.1.0 187
cfg slot.s/enc.m/aud.n inlvl 2.0.0/5.5.0 187
cfg slot.s/enc.m/aud.n input 2.0.0/7.0.0 188
cfg slot.s/enc.m/aud.n mode 2.0.0/7.3.0 188
cfg slot.s/enc.m/aud.n standard 2.0.0/7.8.0 189
cfg slot.s/enc.m/aud.n state 2.0.0/4.0.0 195
cfg slot.s/enc.m/aud.n/adv aacpssignalling 8.1.0/8.1.0 195
cfg slot.s/enc.m/aud.n/adv aactransport 7.3.0/7.3.0 196
cfg slot.s/enc.m/aud.n/adv aacversion 7.3.0/7.3.0 196
cfg slot.s/enc.m/aud.n/adv aacsbrsignaling 7.3.0/7.3.0 196
cfg slot.s/enc.m/aud.n/adv audprodie 2.2.0/5.2.0 197
cfg slot.s/enc.m/aud.n/adv copyright 2.2.0/2.2.0 197
cfg slot.s/enc.m/aud.n/adv deemph 2.2.0/5.0.0 197
cfg slot.s/enc.m/aud.n/adv dialnorm 2.2.0/5.2.0 197
cfg slot.s/enc.m/aud.n/adv langcode 2.2.0/3.3.0 197
cfg slot.s/enc.m/aud.n/adv langcode2 ..... 2.2.0/3.3.0 197
cfg slot.s/enc.m/aud.n/adv mixlvl 2.2.0/5.2.0 198
cfg slot.s/enc.m/aud.n/adv original 2.2.0/5.2.0 198
cfg slot.s/enc.m/aud.n/adv roomtype 2.2.0/5.2.0 198

cfg slot.s/enc.m/aud.n/adv service 2.2.0/5.2.0 198
cfg slot.s/enc.m/aud.n/rtr in 2.2.0/3.3.0 199
cfg slot.s/enc.m/aud.n/rtr lvl 2.2.0/3.3.0 199
cfg slot.s/enc.m/aud.n/rtr out 2.2.0/3.3.0 199
cfg slot.s/enc.m/event/new action 7.5.0/7.5.0 200
cfg slot.s/enc.m/event/new desc, cfg slot.s/enc.m/event/row.n desc 7.5.0/7.5.0 200
cfg slot.s/enc.m/event/new genre, cfg slot.s/enc.m/event/row.n genre 7.5.0/7.5.0 200
cfg slot.s/enc.m/event/new name, cfg slot.s/enc.m/event/row.n name 7.5.0/7.5.0 200
cfg slot.s/enc.m/event/new rating, cfg slot.s/enc.m/event/row.n rating 7.5.0/7.5.0 201
cfg slot.s/enc.m/event/new startdate, cfg slot.s/enc.m/event/row.n startdate 7.5.0/7.5.0 201
cfg slot.s/enc.m/event/new starttime, cfg slot.s/enc.m/event/row.n starttime 7.5.0/7.5.0 201
cfg slot.s/enc.m/event/new usergenre, cfg slot.s/enc.m/event/row.n usergenre 7.5.0/7.5.0 201
cfg slot.s/enc.m/pgm bisssw 5.7.0/5.7.0 202
cfg slot.s/enc.m/pgm ccsource 6.5.2/7.2.0 202
cfg slot.s/enc.m/pgm country 7.5.0/7.5.0 203
cfg slot.s/enc.m/pgm cctran 7.6.0/7.6.0 203
cfg slot.s/enc.m/pgm datasource 7.5.0/7.5.0 203
cfg slot.s/enc.m/pgm datarate 7.5.0/7.5.0 203
cfg slot.s/enc.m/pgm encryptmode 5.7.0/5.7.0 204
cfg slot.s/enc.m/pgm esdsource 8.5.1/8.6 204
cfg slot.s/enc.m/pgm eventsched 8.0.0/8.0.0 204
cfg slot.s/enc.m/pgm name 4.0.0/5.0.0 204
cfg slot.s/enc.m/pgm networkid 5.5.0/5.5.0 205
cfg slot.s/enc.m/pgm noinput 5.6.0/6.0.0 205
cfg slot.s/enc.m/pgm pcrloc 4.0.0/7.7.1 205
cfg slot.s/enc.m/pgm pip 7.0.0/7.2.0 206
cfg slot.s/enc.m/pgm simode 2.0.0/8.1.0 209
cfg slot.s/enc.m/pgm tag 2.0.0/2.0.0 209
cfg slot.s/enc.m/pgm spliceevent 7.7.1/7.7.1 209
cfg slot.s/enc.m/pgm splicegpimode 7.6.0/7.6.0 210
cfg slot.s/enc.m/pgm splicepreroll 7.0.0/7.2.0 210
cfg slot.s/enc.m/pgm splicetrigger 7.0.0/7.6.0 211
cfg slot.s/enc.m/pgm tsrate 2.0.0/8.4.0 212
cfg slot.s/enc.m/vanc didfilter 6.6.0/6.6.0 213
cfg slot.s/enc.m/vanc klvrate 7.5.0/7.5.0 214
cfg slot.s/enc.m/vanc op47lines 7.7.0/7.7.0 215
cfg slot.s/enc.m/vanc rate 2.0.0/6.0.0 215
cfg slot.s/enc.m/vanc smpte2038 ..... 8.5.1/8.6 215
cfg slot.s/enc.m/vanc vancdeg 2.0.0/5.0.0 216
cfg slot.s/enc.m/vanc/srv.n did 2.0.0/6.6.0 217
cfg slot.s/enc.m/vanc/srv.n sdid 2.0.0/7.2.0 217
cfg slot.s/enc.m/vbi vbittx 6.0.0/6.5.0 220
cfg slot.s/enc.m/vbi vbideg 3.1.0/4/0.0 220
cfg slot.s/enc.m/vbi/fld.f/lin.l function 4.0.0/5.7.0 222
cfg slot.s/enc.m/vbi/fld.f/lin.l testpattern 4.0.0/5.2.0 222
cfg slot.s/enc.m/vbi vbittx 6.0.0/6.5.0 223
cfg slot.s/enc.m/vbi/ttxdesc.d langcode 6.5.0/6.5.0 224
cfg slot.s/enc.m/vbi/ttxdesc.d magazinenum 6.5.0/6.5.0 224
cfg slot.s/enc.m/vbi/ttxdesc.d pagenum 6.5.0/6.5.0 224
cfg slot.s/enc.m/vbi/ttxdesc.d type 6.5.0/6.5.0 225
cfg slot.s/enc.m/vid afd 7.5.0/8.1.1 226
cfg slot.s/enc.m/vid aspect 2.0.0/7.5.0 227
cfg slot.s/enc.m/vid dyngop 8.5.1/8.5.1 227
cfg slot.s/enc.m/vid filmdet 2.0.0/2.0.0 227

cfg slot.s/enc.m/vid framerate 7.3.0/7.8.0 228
cfg slot.s/enc.m/vid gop 2.0.0/7.0.0 230
cfg slot.s/enc.m/vid gopsize 5.6.0/8.1.0 230
cfg slot.s/enc.m/vid input 2.0.0/7.0.0 232
cfg slot.s/enc.m/vid minquant 2.0.0/7.6.0 232
cfg slot.s/enc.m/vid offset 2.0.0/6.5.1 232
cfg slot.s/enc.m/vid preproc 6.6.0/7.8.0 233
cfg slot.s/enc.m/vid progrefresh 8.4.0/8.4.0 233
cfg slot.s/enc.m/vid res 2.0.0/7.4.0 236
cfg slot.s/enc.m/vid state 2.0.0/2.0.0 236
cfg slot.s/enc.m/vid vbrselect 8.5.1/8.5.1 236
cfg slot.s/enc.m/vid viddeg 2.0.0/2.0.0 236
cfg slot.s/enc.m/vid vidflt 2.0.0/2.0.0 236
cfg slot.s/enc.m/vid/rtr in 2.2.0/3.3.0 237
cfg slot.s/enc.m/vid/rtr lvl 2.2.0/3.3.0 237
cfg slot.s/enc.m/vid/rtr out 2.2.0/3.3.0 237
cfg slot.s/gen atmVcResMax, cfg slot.s/gen atmVcResMin 8.0.0/8.0.0 238
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cfg slot.s/gen ipVcResMax, cfg slot.s/gen ipVcResMin 8.0.0/8.0.0 238
cfg slot.s/gen muxDxVcResMax, cfg slot.s/gen muxDxVcResMin 8.0.0/8.0.0 239
cfg slot.s/gen muxMxVcResMax, cfg slot.s/gen muxMxVcResMin 8.0.0/8.0.0 239
cfg slot.s/gen protMode 2.2.0/5.0.0 239
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cfg slot.s/gen state 2.0.0/2.0.0 239
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cfg slot.s/ctl.m assocSlot 6.5.1/6.5.1 241
cfg slot.s/ctl.m function 6.5.1/6.5.1 242
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cfg slot.s/ip/dhcp.m ipmask 4.0.0/4.0.0 242
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cfg slot.s/ip/ifc.m ipmask 2.1.0/3.0.0 243
cfg slot.s/ip/ifc.m link 5.2.0/7.4.0 244
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cfg slot.s/ip/ifc.m netdeg 2.1.0/3.0.0 245
cfg slot.s/ip/ifc.m netflt 2.1.0/3.0.0 246
cfg slot.s/ip/ifc.m protnetflt 6.6.0/6.6.0 246
cfg slot.s/ip/ifc.m ripstate 4.0.0/5.2.0 246
cfg slot.s/ip/ifc.m tag 2.1.0/3.0.0 246
cfg slot.s/ip/ifc.m txarptim 8.60 246
cfg slot.s/ip/ifc.m vidgate 5.7.0/5.7.0 247
cfg slot.s/ip/rte.m destaddr 2.1.0/3.0.0 248
cfg slot.s/ip/rte.m destmask 2.1.0/3.0.0 248
cfg slot.s/ip/rte.m hopaddr 2.1.0/3.0.0 248
cfg slot.s/ip/rte.m rowstate 2.1.0/3.0.0 248
cfg slot.s/ip/rte.m tag 2.1.0/3.0.0 249
cfg slot.s/ip/vc_aux.m mcastsrc 7.8.0/7.8.0 249
cfg slot.s/ip/vc_aux.m vcindex 7.8.0/7.8.0 250
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cfg slot.s/ip/vlan.m ipMask 8.5.1/8.5.1 250
cfg slot.s/ip/vlan.m mpegTtl 8.5.1/8.5.1 250

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cfg slot.s/ip/vlan.m vidgate 8.5.1/8.5.1 251
cfg slot.s/ip/vlan.m vlid 8.5.1/8.5.1 251
cfg slot.s/ip/vc.m fec 4.0.0/6.5.1 253
cfg slot.s/ip/vc.m fecorder 5.2.0/5.6.0 253
cfg slot.s/ip/vc.m fecperiod 5.2.0/5.6.0 253
cfg slot.s/ip/vc.m function 2.1.0/7.8.0 254
cfg slot.s/ip/vc.m ipaddr 4.0.0/5.6.0 255
cfg slot.s/ip/vc.m mcastsrc 6.6.0/6.6.0 256
cfg slot.s/ip/vc.m mpegproc 4.0.0/5.2.0 256
cfg slot.s/ip/vc.m port 4.0.0/5.2.0 256
cfg slot.s/ip/vc.m priority 8.5.1/8.5.1 257
cfg slot.s/ip/vc.m rowstate 2.1.0/3.0.0 257
cfg slot.s/ip/vc.m rxnulldis 5.2.0/5.2.0 257
cfg slot.s/ip/vc.m rxrate 5.2.0/7.0.0 257
cfg slot.s/ip/vc.m tag 2.1.0/3.0.0 257
cfg slot.s/ip/vc.m txtos 5.2.0/5.6.1 257
cfg slot.s/ip/vc.m tsperip 5.2.0/5.6.0 258
cfg slot.s/ip/vc.m txrate 4.0.0/5.6.1 258
cfg slot.s/ip/vc.m vcdeg 2.1.0/3.0.0 258
cfg slot.s/ip/vc.m vcflt 6.5.0/6.5.0 258
cfg slot.s/ip/vc.m vlid 5.6.0/8.5.1 258
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cfg slot.s/mux/dxifc.m netflt 3.1.0/4/0.0 259
cfg slot.s/mux/dxifc.m simode 4.0.0/5.6.0 259
cfg slot.s/mux/dxifc.m tag 3.1.0/4/0.0 259
cfg slot.s/mux/dxvc.m audfilter 6.6.0/6.6.0 261
cfg slot.s/mux/dxvc.m datafilter 6.6.0/6.6.0 262
cfg slot.s/mux/dxvc.m dropca 6.0.0/6.0.0 263
cfg slot.s/mux/dxvc.m function 5.7.0/5.8.0 264
cfg slot.s/mux/dxvc.m ifc 3.1.0/4/0.0 264
cfg slot.s/mux/dxvc.m pid 5.7.0/5.7.0 265
cfg slot.s/mux/dxvc.m prognum 3.1.0/4/0.0 265
cfg slot.s/mux/dxvc.m rate 3.1.0/5.8.0 265
cfg slot.s/mux/dxvc.m rowstate 3.1.0/4/0.0 265
cfg slot.s/mux/dxvc.m tag 3.1.0/3.1.0 266
cfg slot.s/mux/dxvc.m vcdeg 3.1.0/3.1.0 266
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Chapter 25: NetVX™ Trap Descriptions 25

25.1 Overview of NetVX™ Traps and Alarms

This chapter provides a description of each alarm and trap message that the NetVX™ may issue. The NetVX™ provides the following classes of alarm notification.

25.1.1 Coding Alarms

- "Audio Degrade Alarms" on page 426
- "Audio Fault Alarm" on page 427
- "Decoder Degrade Alarms" on page 428
- "VANC Degrade Alarm" on page 445
- "VBI Degrade Alarm" on page 446
- "Video Degrade Alarms" on page 451
- "Video Fault Alarm" on page 452

25.1.2 General Alarms

- "Module Degrade Alarms" on page 431
- "Module Fault Alarms" on page 434
- "Network Degrade Alarm" on page 435
- "Network Fault Alarms" on page 437
- "Service Degrade Alarms" on page 438
- "Service Fault Alarm" on page 439
- "System Degrade Alarm" on page 440
- "System Fault Alarms" on page 444
- "VC Degrade Alarms" on page 446
- "VC Fault Alarm" on page 451
- "Start Up Traps" on page 452

25.2 Trap and Alarm Types

25.2.1 Audio Degrade Alarms

Trap Name: **Audio Degrade - Channel Not Present**
MIB Numbers: 01, 02
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Audio Channel Number: [Value 4]
Description: An encoder is configured to code an embedded audio channel but the specified audio channel is not present in the video input.
Additional Information: [Value 6]
CorrectiveAction(s): 1 Verify that the correct embedded audio group and channel are specified.
2 Verify that the source equipment is embedding audio in the desired group and channel.

Trap Name: **Audio Degrade - CRC Error**
MIB Numbers: 03, 04
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Audio Channel Number: [Value 4]
Description: The encoder is receiving CRC errors on its digital audio input or on its embedded audio channel.
Additional Information: [Value 6]
CorrectiveAction(s): Check the audio connection feeding the specified encoder.

Trap Name: **Audio Degrade - Format Not Supported**
MIB Numbers: 05, 06
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Audio Channel Number: [Value 4]
Description: There is a mismatch between the expected audio format and the audio format received. This mismatch may be due to one of the following:

- The encoder may be configured to receive and pass through compressed audio, but it is receiving uncompressed audio.
- There may be a mismatch between the configured and the received embedded audio input format.
- There may be a mismatch between the configured and the received embedded audio input rate.

Additional Information: [Value 6]
CorrectiveAction(s): 1 Verify that the source equipment is providing the desired audio format.
2 Verify that the encoder is configured to accept the desired audio format.

Trap Name:	**Audio Degrade - Configuration Error**
MIB Numbers:	112, 113
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Slot Number: [Value 2] Encoder Number: [Value 3]
Description:	Indicates an audio configuration error. Additional Information: [Value 6]
CorrectiveAction(s):	Verify that the audio encoder configuration matches that of the module itself. For example, if the module is keyed to provide Dolby audio only, check that the configuration does not specify MPEG audio.

Trap Name:	**Audio Degrade - A/V Sync Raise**
MIB Numbers:	124, 125
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Slot Number: [Value 2] Encoder Number: [Value 3]
Description:	This trap indicates that the system has made an audio/video synchronization adjustment. Additional Information: [Value 6]
CorrectiveAction(s):	This trap is informational. No action is required.

25.2.2 Audio Fault Alarm

Trap Name:	**Audio Fault - Loss of Audio**
MIB Numbers:	07, 08
Message:	[Message]
Variables:	Trap Count Number: [Value 1] Slot Number: [Value 2] Encoder Number: [Value 3] Audio Channel Number: [Value 4]
Description:	The encoder is no longer receiving an audio signal. Additional Information: [Value 6]
CorrectiveAction(s):	1 Verify that the source equipment is providing audio. 2 Check the audio connection feeding the specified encoder.

25.2.3 Decoder Degrade Alarms

Trap Name: **MPEG Decoder Degrade - Audio Decode Errors**
MIB Numbers: 09, 10
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Decoder Number: [Value 3]
Audio Channel Number: [Value 4]
Description: The audio decoder is experiencing errors.
Additional Information: [Value 6]
CorrectiveAction(s):
1 Verify that the source equipment is providing audio.
2 If possible, check the audio connection feeding the source encoder.
3 Check that the decoder configuration is specifying the correct source.

Trap Name: **MPEG Decoder Degrade - Errors In Transport Stream**
MIB Numbers: 11, 12
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Decoder Number: [Value 3]
Description: The decoder is receiving a transport stream containing errors.
Additional Information: [Value 6]
CorrectiveAction(s):
1 Verify that the source equipment is providing a transport stream.
2 If possible, check feeds to the encoder.
3 Check that the decoder configuration is specifying the correct source.

Trap Name: **MPEG Decoder Degrade - No Audio**
MIB Numbers: 13, 14
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Decoder Number: [Value 3]
Audio Channel Number: [Value 4]
Description: A decoder is configured to decode audio, but audio is not available in the specified program.
Additional Information: [Value 6]
CorrectiveAction(s):
1 Verify that the source equipment is providing audio.
2 If possible, check the audio connection feeding the source encoder.
3 Check that the decoder configuration is specifying the correct source.

Trap Name: **MPEG Decoder Degrade - No Program**
MIB Numbers: 15, 16
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Decoder Number: [Value 3]
Description: A decoder is configured to decode a program, the transport stream indicates that there should be a program to decode yet there is none.
Additional Information: [Value 6]
CorrectiveAction(s):
1 Verify that the source equipment is providing a program.
2 If possible, check the connection feeding the source encoder.
3 Check that the decoder configuration is specifying the correct program.

Trap Name: **MPEG Decoder Degrade - No Stream**
MIB Numbers: 17, 18
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Decoder Number: [Value 3]
Description: A decoder is configured to decode a program but it is not receiving a transport stream.
Additional Information: [Value 6]
CorrectiveAction(s): Verify connections between the source equipment and the NetVX™.

Trap Name: **MPEG Decoder Degrade - No Video**
MIB Numbers: 19, 20
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Decoder Number: [Value 3]
Description: A decoder is configured to decode video, but video is not available in the specified program.
Additional Information: [Value 6]
CorrectiveAction(s):
1 Verify that the source equipment is providing video.
2 If possible, check the video connection feeding the source encoder.
3 Check that the decoder configuration is specifying the correct source.

Trap Name: **MPEG Decoder Degrade - Video Decode Errors**
MIB Numbers: 21, 22
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Decoder Number: [Value 3]
Description: The video decoder is experiencing errors.
Additional Information: [Value 6]
CorrectiveAction(s):
1 Verify that the source equipment is providing video.
2 If possible, check the video connection feeding the source encoder.
3 Check that the decoder configuration is specifying the correct source.
4 Check that the reference signal provided by the SYS-A22 is configured as the same type as the video being decoded by the decoder. Both settings should be either NTSC or PAL.

Trap Name: **MPEG Decoder Degrade - Decryption Error**
MIB Numbers: 106, 107
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Decoder Number: [Value 3]
Description: This trap indicates the decoder is experiencing a decryption error.
Additional Information: [Value 6]
CorrectiveAction(s): Verify and re-enter the decoder decryption key.

25.2.4 Module Degrade Alarms

Trap Name: **Module Degrade - Configuration Error**
MIB Numbers: 91
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates an error in the configuration received by the system. This type of error is typically the result of a mis-configuration originating at one of the manual configuration interfaces such as the craft port, telnet, or front panel interface.

Encoder: BISS Configuration

- Cause: If an encoder issued this alarm, it may be because BISS encryption is enabled but a Session Word has not been specified.
- Solution: Verify whether or not BISS encryption has been enabled. If BISS is enabled, then verify that the Session Word has been specified.

Encoder: Stat Mux Configuration

- Cause: This trap is issued when one encoder is used as the source of more than one cross connection that is enabled to operate stat mux mode.
- Solution: Identify all of the cross connections that use the encoder referenced above. Check each cross connection destination to see if more than one of them has statmux enabled. Ensure only one destination has statmux enabled.

Encoder: Module Type and Feature Conflict

- Cause: This trap is issued if a module is not keyed with the ATSC feature bit but UDP is configured as the closed caption source.
- Solution: Change the “Closed Caption Source” to a value other than “UDP”.

Additional Information: [Value 6]

Other Possibilities...

If a module located in a SYS-1700 is reporting this error, then it is possible that the module is programmed for operation only in a SYS-200 or SYS-300 chassis. The module will not operate as desired under such conditions. Modules programmed for operation in SYS-200 and SYS-300 chassis must remain installed in these model chassis.

CorrectiveAction(s): Use the descriptive text (above) in this trap to identify the error’s cause and possible solution.
Message: The Vidiem Management System identifies most configuration errors and discrepancies. Use Vidiem to upload the configuration from the system reporting this error. Note any error messages, then use Vidiem to make corrections, and download the corrected configuration back to the unit.

Trap Name: **Module Degrade - General Degrade**
MIB Numbers: 81, 82
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: This condition may be caused by either of the following:

All Modules

- The module in the specified slot is experiencing a degrade condition such as intermittent errors.
- A mismatch between the firmware on the active system controller and the firmware on the application module.

ATM-X11 Modules

- An optical transmitter is in use, but its performance is degraded.

Additional Information: [Value 6]

CorrectiveAction(s): Reset the module. The module upgrades during reset to the same version of firmware running on the system controller.

Verify that the module is configured as desired.

Trap Name: **Module Degrade - Module Inserted**
MIB Numbers: 79
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates that a module was inserted into the NetVX™ at the specified slot location.
Additional Information: [Value 6]
CorrectiveAction(s): None

Trap Name: **Module Degrade - Module Removed**
MIB Numbers: 80
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates that a module was removed from the NetVX™ at the specified slot location.
Additional Information: [Value 6]
CorrectiveAction(s): None Required

Trap Name: **Module Degrade - Module Wrong Type**
MIB Numbers: 23, 24
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: There is a mismatch between the module type that the slot is configured to receive and the installed module type.
Additional Information: [Value 6]
CorrectiveAction(s):

- Change the module type for this slot. - OR -
- Use the module type for which this slot is configured.

Trap Name: **Module Degrade - Protection Failback Event**
MIB Numbers: 89
Message: [Message]
Variables: Trap Count Number: [Value 1]
From: Slot Number: [Value 2]
To: Slot Number: [Value 3]
Description: Service has been restored to the module in slot [Value 2] from slot [Value 3].
Additional Information: [Value 6]
CorrectiveAction(s): None Required

Trap Name: **Module Degrade - Protection Failover Event**
MIB Numbers: 90
Message: [Message]
Variables: Trap Count Number: [Value 1]
From: Slot Number: [Value 2]
To: Slot Number: [Value 3]
Description: This trap was deprecated in the NetVX™'s 5.6.0 firmware release. This description remains here for backward-compatibility.
The module in slot [Value 2] is experiencing a loss of signal or has failed and the module in slot [Value 3] has picked up its service.
Additional Information: [Value 6]
CorrectiveAction(s): 1 Check, wiring, signals, and configuration for the module in slot [Value 2].
2 Contact technical support if you cannot determine the source of the module failover.

Trap Name: **Module Degrade - Protection Failover Raise/Clear**
MIB Numbers: 122, 123
Message: [Message]
Variables: Trap Count Number: [Value 1]
From: Slot Number: [Value 2]
To: Slot Number: [Value 3]
Description: Some event has triggered a failover from [Value 2] to slot [Value 3].
Additional Information: [Value 6]
CorrectiveAction(s): 1 Check, wiring, signals, and configuration for the module in slot [Value 2].
2 Contact technical support if you cannot determine the source of the module failover.

Trap Name: **Module Degrade - Status Change**
MIB Numbers: 127
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates a change in the module's operating status. This trap is sent whenever the slot state changes between any of the following states. Each of these states are maintained by 'cfg slot.n gen/state'.

- Booting
- Fault
- In Service
- None
- Not Present
- Offline
- Wrong Type

Additional Information: [Value 6]
CorrectiveAction(s): If the change in module state was unexpected, then locate the root cause.

- Reset the module, if necessary, to ensure it boots properly.
- Check that a module is actually present in the slot.
- Check that the model type of the actual module matches that for which the slot is configured.

25.2.5 Module Fault Alarms

Trap Name: **Module Fault - General Fault**
MIB Numbers: 25, 26
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: The module in the specified slot is experiencing a general fault.
Additional Information: [Value 6]

ATM-X11 Modules

- The module is configured to have an optical transmitter, but that transmitter is not present.
- An optical transmitter is in use, but its performance is outside acceptable bounds.

CorrectiveAction(s):

- Reset the module.
- Verify that the module is configured as desired.

Trap Name: **Module Fault - Module Not Present**
MIB Numbers: 27, 28
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: The system expects a module to be present, but the module is not present.
Additional Information: [Value 6]
CorrectiveAction(s):

1. Configure the slot to not expect a module.
2. Add the expected module.
3. Add or replace the expected module.

SYS-A12 System Controllers

The NetVX™ may also issue this fault when a backup system controller in slot 2 has taken over service from a failed system controller in slot 1. At such a point, the backup controller ceases communication with the failed controller and as a result it can no longer verify the presence of the failed controller located in slot 1. This condition may be the result of a manual failover to slot 2, a failure of the secondary Ethernet connection linking the two controller modules, or a failure of the controller in slot 1. This alarm is an expected behavior under any of these conditions.

Trap Name: **Module Fault - Software Fault**
MIB Numbers: 77, 78
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates the module is experiencing a serious software fault. This fault condition is very rare and may be the result of an incomplete software upgrade.
Additional Information: [Value 6]
CorrectiveAction(s):

1. Use the “util firmware” command to move the system back to a previous firmware release.
2. If the previous release fixes the problem, try upgrading the system firmware again.
3. An intermittent IP connection could possibly undermine the NetVX™’s ability to receive a complete firmware download. Troubleshoot IP connectivity between the PC providing firmware (running the “Upgrade.exe” utility) and the NetVX™.

Trap Name: **Module Fault - Booting**
MIB Numbers: 128, 129
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates the module is booting due to any of the following reasons.

- Internal Request: Indicates the module encountered an internal error and reset. This action triggers failover to a backup module if one is available.
- Internal Time-out: Indicates the module's watchdog timer caused a reset. This action triggers failover to a backup module if one is available.
- User (or External) Request: Indicates a user-initiated reset through one of the user interfaces. This action triggers failover to a backup module if one is available.

Additional Information: [Value 6]
CorrectiveAction(s): This trap is informative. No corrective action is necessary.

25.2.6 Network Degrade Alarm

Trap Name: **Network Degrade - Configuration Error**
MIB Numbers: 99, 100
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Interface Number: [Value 3]
Description: Indicates a configuration error causing a degrade in the network. This error is most likely caused when the TMX-100 attempts to incorporate a mis-configured carousel data file into a multiplexed output. See below for possible causes.
Additional Information: [Value 6]
CorrectiveAction(s): **Format Corrupt**

- The carousel file has an internal error that violates the specified format. This can apply to the current, next, or update file.
- Verify that the source that creating the carousel file is configured as desired and that all settings are consistent with one another.

Insufficient Bandwidth

- The carousel's configured bitrate is too low to carry the data from the current file. Depending on the cycle times of the data being multiplexed into the transport stream, this condition may be temporary (a packet was sent later than its scheduled time) or permanent (the file has too much data for the allocated bandwidth).
- If you are attempting to stream several carousel files simultaneously, the collective bandwidth may exceed the rate configured (cfg/slot.s/mux/mxifc.m crslrate) for carousel streaming.

PID Conflict

- A data segment in the carousel file specified a PID that conflicts with another PID in the transport stream.
- Check the PID setting of the carousel streamer.

No File

- If the carousel is configured to be active, a file should exist to be streamed. If no file has been provided in the appropriate directory, a fault will be asserted.
- Verify that FTP and any other network settings and connections are properly configured. Verify that the NetVX™'s FTP interface (cfg sys/ctl ftp) is enabled.

Trap Name: **Network Degrade - Errors in Input Signal**

MIB Numbers: 29, 30

Message: [Message]

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Interface Number: [Value 3]

Description: Indicates errors in the signal on the specified network interface input.

ATM-X11

- (A) Indicates that the BITS signal is either not present or present with errors.
- (B) Indicates that the expected Path Trace value, set using the (cfg slot.s/atm/ifc.m rxpathtraceexp), does not match the received path trace status value (stat slot.s/atm/ifc.1/ss rxPathTraceRcv).

Additional Information: [Value 6]

CorrectiveAction(s):

- (A) Check the optical link budget.
- (A) Check cables feeding the network signal to the NetVX™.
- (A) Check that rates on the NetVX™ and the ATM switch correlate.
- (A) ATM Remote Defect Indicator (RDI) errors may also trigger this trap when the interface is operating bidirectional mode.
- (B) Coordinate with the user on the far-end sending device to ensure the correct line on this point-to-point connection is being used on each end.

GBE-C11

- Indicates the input signal either is not present, or is present with errors.

CorrectiveAction(s):

- Check the cable(s) feeding the network signal to the GBE module.
- Check that the modules IP settings are correct.

Trap Name: **Network Degrade - Receive Buffer Overflow**

MIB Numbers: 118, 119

Message: [Message]

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]

Description: Indicates the demultiplexer's PSI data receive buffer has exceeded its 1.0 Mbps rate limit. This rate limit controls the amount of PSI data that can be processed on a single demux interface.

Additional Information: [Value 6]

CorrectiveAction(s):

- Try to reduce the amount of optional PSI data, such as EITs or ETT's, which describe programs "too" far into the future (e.g. one week or more). The amount of data may be reduced by increasing the period of time (cycle time) between which PSI data is transmitted.
- Verify that the multiplexer is not putting program data, such as video or audio, on any PIDs on which the demultiplexer is expecting to find PSI data.

Trap Name: **Network Degrade - Transmit Buffer Overflow**
MIB Numbers: 85, 86
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates that the rate at which data on this VC is received by the TMX-M12 VC transmit buffer is higher than the provisioned transmit bit rate. This situation causes the TMX-M12 output's policing function to discard cells.
Additional Information: [Value 6]
CorrectiveAction(s): Reconcile the rate at which data is sent to this VC with the VC's provisioned transmit bit rate.

25.2.7 Network Fault Alarms

Trap Name: **Network Fault - Loss of Input Signal**
MIB Numbers: 31, 32
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Interface Number: [Value 3]
Description: Indicates a loss of signal on the specified ATM interface's input.
This trap will cause a failover on primary ATM modules that have redundant backups.
ATM-X11
Indicates that the ATM optical interface is configured to receive data but and SFP module is not present to do so.
Additional Information: [Value 6]
CorrectiveAction(s):
1 Check cables providing the network signal to the NetVX™.
2 An ATM Alarm Indication Signal (AIS) is one possible cause of this trap. Check the equipment in the transmission chain feeding this module.
3 Check that the source device is providing a signal.
4 Check that only the receive interfaces that need to be on are on. For example, the TMX module provides the ability to turn off an input interface. If an input the interface is set to on, and it is not in use, it may issue this warning.

Trap Name: **Network Fault - Transport Stream Errors**
MIB Numbers: 95, 96
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Interface Number: [Value 3]
Description: Indicates the system could not locate the Program Allocation Table (PAT) in an incoming transport stream. The transport stream may be entering the TMX module through an internal demux (DMX) interface, or through a physical, external receive interface.
Additional Information: [Value 6]
CorrectiveAction(s): **Receive Interface**

- Check the cable providing the signal to the TMX receive interface.
- Check that the source device is providing a transport stream.
- Check that only the receive interfaces that need to be on are on. For example, the TMX module provides the ability to turn off an input interface. If an input the interface is set to on, and it is not in use, it may issue this warning.

Demux Interface

- Check that the cross connection providing the signal to the demux interface is configured with the desired source and destination.
- Check that the cross connection's source VC is providing a signal.

25.2.8 Service Degrade Alarms

Trap Name: **Service Degrade - Errors in Service**
MIB Numbers: 33,34
Message: [Message]
Variables: Trap Count Number: [Value 1]
Main Cross Connection Number: [Value 3]
Backup Cross Connection Number: [Value 4]
Description: Indicates that the specified cross connection is experiencing a degrade in service. This service degrade is the result of one or more degrade alarm conditions affecting the cross connection's source or destination module(s).
Additional Information: [Value 6]
CorrectiveAction(s): Resolve any degrade conditions in the source or destination modules for this cross connection:

1 Look in the trap log for a degrade trap issued at or around the same time as this one.
2 If such a trap exists, check if the associated module is a source or a destination for the cross connection identified by this trap.

Trap Name: **Service Degrade - Protection Failover Event**
MIB Numbers: 103
Message: [Message]
Variables: Trap Count Number: [Value 1]
From Cross Connection Number: [Value 2]
To Cross Connection Number: [Value 3]
Description: Indicates a switch has taken place between two primary cross connection's. One connection may have served as a backup for the other.
Additional Information: [Value 6]
CorrectiveAction(s): Resolve any degrade conditions in source or destination modules for this cross connection.

Trap Name: **Service Degrade - Protection Failover**
MIB Numbers: 130, 131
Message: [Message]
Variables: Trap Count Number: [Value 1]
From Cross Connection Number: [Value 2]
To Cross Connection Number: [Value 3]
Description: Indicates a cross connection's source has failed and that it's backup cross connection has taken over the service.
Additional Information: [Value 6]
CorrectiveAction(s): Resolve any degrade conditions in the source or destination modules for this cross connection:
1 Look in the trap log for any related degrade traps issued at or around the same time as this one.
2 If such a trap exists, check if the associated module is a source or a destination for the cross connection identified by this trap.

25.2.9 Service Fault Alarm

Trap Name: **Service Fault - Loss of Service**
MIB Numbers: 35, 36
Message: [Message]
Variables: Trap Count Number: [Value 1]
Cross Connection Number: [Value 3]
Description: Indicates that the specified cross connection is experiencing a loss of service (LOS). This LOS is associated with one or more fault alarm conditions affecting the cross connection's source or destination module(s).
Additional Information: [Value 6]
CorrectiveAction(s): Resolve any fault conditions in the source or destination modules for this cross connection:
1 Look in the trap log for a degrade trap issued at or around the same time as this one.
2 If such a trap exists, check if the associated module is a source or a destination for the cross connection identified by this trap.

25.2.10 System Degrade Alarm

Trap Name: **System Degrade - Configuration Error**

MIB Numbers: 97, 98

Message: [Message]

Variables: Trap Count Number: [Value 1]
[Value 2]
[Value 3]
[Value 4]

Description: Indicates a configuration error has occurred. The system checks its configuration to avoid errors. This trap indicates a condition that could not be reconciled according to the system's constraints. Causes for this error may include, but are not limited to the following.

GPI-Triggered Configuration Load Missing

- Cause: A specified configuration is programmed to load when a GPI is closed, but that configuration does not exist.
- Solution: Either add the missing configuration, or change the name of an existing configuration to match that of the targeted configuration.

Keyed Feature Mismatch

- Cause: An attempt was made to activate a keyed feature that the current software key does not allow.
- Solution: Modify the configuration to not activate the keyed feature.

Non-Unique Program Base PIDs

- Cause: The system-level program base PIDs are not unique. These PIDs are configured through the craft port's "cfg sys/pgm" branch and include: AudPid, DataPid, EcmPid, PcrPid, PmtPid, VidPid. Vidiem provides configuration access to these PIDs through: System > (right-click) + Properties > Fundamentals > Program
- Solution: Change one of the base PID (and any of it's dependent PIDs) as needed to make the base PIDS unique.

Daylight Saving Time

- Cause: This trap may be issued if a transition into or out of Daylight Saving Time passed more than two months prior and the system has not been re-configured for the next Daylight Saving time transition.
- Solution: Configure the system for the upcoming Daylight Saving Time transition.

Application Module: Protection chain is not terminated at slot.x

- Cause: The module at the end of the protection chain (the first one used in the event of a failover) is not designated as a backup module.
- Solution: Note the slot number specified in the trap message and designate the module in that slot as a backup.

Application Module: Cyclic protection chain detected at slot.x

- Cause: The combination of backup modules form a circular path. For example: 'A' is protected by 'B', 'B' is protected by 'C', and 'C' is protected by 'A'.
- Solution: Note the slot number specified in the trap message and designate the module in that slot as a backup.

Additional Information: [Value 6]

CorrectiveAction(s): Change the model type in the system configuration to match that of the actual system.

Trap Name: **System Degrade - Fan Failure**
MIB Numbers: 37, 38
Message: [Message]
Variables: Trap Count Number: [Value 1]
Fan Number: [Value 3]
Description: Indicates that one of the system's fans has failed.
Additional Information: [Value 6]
CorrectiveAction(s):
1 Verify that the fan is not working.
2 Replace the broken fan.

Trap Name: **System Degrade - Front Panel Failure**
MIB Numbers: 39, 40
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: Indicates the front panel controller has experienced a serious error.
Additional Information: [Value 6]
CorrectiveAction(s): Contact technical support to arrange to return your system for servicing.

Trap Name: **System Degrade - General Purpose Input Raise**
MIB Numbers: 101
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: Indicates that the specified GPI has changed state.
CorrectiveAction(s): GPIs are triggered by external equipment and/or controls. Conditions responsible for triggering the GPI may or may not require corrective action depending on the application.

Trap Name: **System Degrade - Over Temperature**
MIB Numbers: 41, 42
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: Indicates that the system's internal temperature has risen above 70 degrees Celsius. The system is not designed to operate at these temperatures and may provide inconsistent service, or may fail to operate.
Additional Information: [Value 6]
CorrectiveAction(s):
1 Check that the system's front air intake and rear air exhaust ports are not obstructed.
2 Ensure that both fans are operational.
3 Power down the system.
4 Move the system to a cooler environment where such overheating is not a possibility.

Trap Name: **System Degrade - Power Supply Failure**
MIB Numbers: 43, 43
Message: [Message]
Variables: Trap Count Number: [Value 1]
Power Supply: [Value 3]
Description: Indicates that one of the system's modular power supplies has failed.
Additional Information: [Value 6]
CorrectiveAction(s): Replace the failed power supply.

Trap Name: **System Degrade - Relay Failure**
MIB Numbers: 45, 46
Message: [Message]
Variables: Trap Count Number: [Value 1]
GPO Number: [Value 3]
Description: Indicates that the system has detected that a GPO relay is not in the state expected based on software configuration.
Additional Information: [Value 6]
CorrectiveAction(s): Disconnect any equipment that uses the broken GPI or GPO as a trigger.

Trap Name: **System Degrade - Serial Port Error**
MIB Numbers: 104, 105
Message: [Message]
Variables: Trap Count Number: [Value 1]
Serial Port Number: [Value 3]
Description: Indicates that the system has experienced a problem with router control such as no echo, or no prompt returned by the router. This trap is only issued when the serial port is configured to operate with a router.
Additional Information: [Value 6]
CorrectiveAction(s):
1 Check the external serial port connections between the NetVX™'s system controller and the NetVX™ connector board.
2 Check the serial port connection between the NetVX™ and the external equipment.
3 Verify that the serial port baud rate is the same on both the NetVX™ and on the external equipment.

Trap Name: **System Degrade - Firmware Bind Successful**
MIB Numbers: 108
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: Indicates that the system has successfully bound the firmware release.
Additional Information: [Value 6]
CorrectiveAction(s): None required.

Trap Name: **System Degrade - Firmware Bind Unsuccessful**
MIB Numbers: 109
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: Indicates that the system could not successfully bind the targeted firmware release. This error may be caused by a corrupt, or incomplete firmware load.
Additional Information: [Value 6]
CorrectiveAction(s):
1 Make a second attempt to bind to the desired firmware load. If the second bind attempt also fails, then try the following step(s).
2 Use the Upgrade.exe utility (included on the release CD) to reload the firmware, then attempt to bind and reset the system again.
3 If the above steps fail, then contact technical support.

Trap Name: **System Degrade - Reference Error**
MIB Numbers: 110, 111
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Indicates the system controller has lost its reference signal input.
Additional Information: [Value 6]
CorrectiveAction(s):
1 Verify that the cable and connections to the system controller do not have any breaks.
2 Verify that the reference source is operating properly.

Trap Name: **System Degrade - User-Initiated Event**
MIB Numbers: 126
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates the system has experienced any one of the following user-initiated events.
- Manual module failover (this does not include failover initiated by the system). Note that module failback has its own trap event, whether initiated by the system or the operator.
- Manual cross-connect failover (this does not include failover initiated by the system).
- Module or system reset.
- Module or system keying.
- Configuration load, save or delete from file.
- Profile load, save or delete from file.
- System date or time change.
- SNMP community name change.
- Password change.
- System startup.

Additional Information: [Value 6]
CorrectiveAction(s): This trap is informative. No corrective action is necessary.

25.2.11 System Fault Alarms

Trap Name: **System Fault - Loss of 3.3V Supply**
MIB Numbers: 47, 48
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: Indicates a loss of 3.3 volt power. This fault may be due to a partial or intermittent power supply failure.
Additional Information: [Value 6]
CorrectiveAction(s): Replace the power supply as soon as possible.

Trap Name: **System Fault - Loss of 5V Supply**
MIB Numbers: 49, 50
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: Indicates a loss of 5 volt power. This fault may be due to a partial or intermittent power supply failure.
Additional Information: [Value 6]
CorrectiveAction(s): Replace the power supply as soon as possible.

Trap Name: **System Fault - Loss of +12V Supply**
MIB Numbers: 51, 52
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: Indicates a loss of +12 volt power. This fault may be due to a partial or intermittent power supply failure.
Additional Information: [Value 6]
CorrectiveAction(s): Replace the power supply as soon as possible.

Trap Name: **System Fault - Loss of -12V Supply**
MIB Numbers: 53, 54
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: Indicates a loss of -12 volt power. This fault may be due to a partial or intermittent power supply failure.
Additional Information: [Value 6]
CorrectiveAction(s): Replace the power supply as soon as possible.

Trap Name: **System Fault - Fan Failure**
MIB Numbers: 114, 115
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Description: Indicates both fans in a VR-1700 have failed.
Additional Information: [Value 6]
CorrectiveAction(s): 1 Immediately replace the fans in the affected system.
2 Power down the system immediately if replacement fans are not available.

Trap Name: **System Fault - Power Supply Failure**
MIB Numbers: 116, 117
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Description: Indicates that both of the VR-1700's power supplies have failed, or if only a single power supply is present then only that one power supply has failed.
Additional Information: [Value 6]
CorrectiveAction(s): Immediately replace the failed power supply.

25.2.12 VANC Degrade Alarm

Trap Name: **VANC Degrade - VANC Error**
MIB Numbers: 55, 56
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Description: Indicates that encoder dropped VANC packets. This can occur for several reasons, such as errors in the received signal, or receiving VANC data at a rate higher than the provisioned transmit bit rate. This situation results in loss of VANC data before encoding.
Additional Information: [Value 6]
CorrectiveAction(s): Use the "cfg slot.s/enc.m/vanc rate" command to increase the amount of bandwidth dedicated to VANC data. If the input signal has errors, provide a clean signal.

Trap Name: **VANC Degrade - VANC Splice**
MIB Numbers: 132
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Description: Indicates the time at which a splice point event occurred.
Additional Information: [Value 6]
CorrectiveAction(s): None required.

25.2.13 VBI Degrade Alarm

Trap Name: **VBI Degrade - Excessive VBI Errors**
MIB Numbers: 57, 58
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Description: Indicates excessive parity errors on the VBI signal.
Additional Information: [Value 6]
CorrectiveAction(s):
1 Use the “stat slot.s/enc.m/vbi/fld.f/lin.l err” and “stat slot.s/dec.m/vbi/fld.f/lin.l err” commands to check error counts on each line. If errors increment on all the VBI lines, then check the VBI source equipment.
2 If encoder errors increment on a single VBI line, then check the encoder’s configuration for insertion on that line.
3 If decoder errors increment, then begin by checking that the source equipment or encoder are providing VBI data on the specified line. Next check the decoder’s VBI settings for a configuration error.

25.2.14 VC Degrade Alarms

Trap Name: **VC Degrade - AAL-1 Un-correctable Errors**
MIB Numbers: 59, 60
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Virtual Channel Number: [Value 3]
Virtual Channel Type: [Value 5]
Description: Indicates that more AAL-1 errors were received than could be corrected. This error may be due to any of the following causes.
- An ATM switch throwing away cells because of network congestion.
- An over-subscribed connection.
- A mis-configuration.
- A bad physical link can also cause bit errors which could trigger this alarm condition.

Additional Information: [Value 6]
CorrectiveAction(s):
1 Check bit rate settings on both the transmitting and the receive side of this VC. Verify that both of these settings are set properly with respect to one another (make sure that both rate correspond).
2 On the transmit side, check cables between source equipment and the ATM switch or network interface.
3 On the receive side, check cables between the ATM switch or network interface and the NetVX™.

Trap Name: **VC Degrade - AAL-5 CRC Errors**
MIB Numbers: 61, 62
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Virtual Channel Number: [Value 3]
Virtual Channel Type: [Value 5]
Description: These errors may be due to any of the following causes.

- An ATM switch throwing away cells because of network congestion.
- An over-subscribed connection.
- A mis-configuration.
- A bad physical link can also cause bit errors which could trigger this alarm condition.

Additional Information: [Value 6]

CorrectiveAction(s):
1 Check bit rate settings on both the transmitting and the receive side of this VC. Verify that both of these settings are set properly with respect to one another. e.g. Transmit does not exceed receive, or vice versa.
2 On the transmit side, check cables between source equipment and the ATM switch or network interface.
3 On the receive side, check cables between the ATM switch or network interface and the NetVX™.

Trap Name: **VC Degrade - Alarm Indication Signal (AIS) Received**
MIB Numbers: 63, 64
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Virtual Channel Number: [Value 3]
Virtual Channel Type: [Value 5]
Description: Indicates a failure affecting this VC has been detected by “upstream” piece of equipment in the ATM network.
Additional Information: [Value 6]

CorrectiveAction(s):
1 Verify this error condition with your network operations center or service provider.
2 If possible, re-configure the signal on each end to use a non-affected virtual channel.

Trap Name: **VC Degrade - Configuration Error**

MIB Numbers: 93

Message: [Message]

Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Virtual Channel Type: [Value 5]

Description: Indicates a VC configuration error. Generally this trap indicates either an inconsistency or information missing from a VC's configuration.

General Solution: The Vidiem Management System identifies most configuration errors and discrepancies. Use Vidiem to upload the configuration from the system reporting this error. Note any error messages, then use Vidiem to rapidly make corrections, and download the corrected configuration back to the unit.

This trap may be caused by any of the following.

GBE-C11-Specific Issues

- Cause: This trap may be caused by an insufficient number of FEC receive buffers available for the number of VCs trying to transmit to the module.
- Solution: When this trap is raised for the GBE-C11, there is no corrective action that may be taken on the local NetVX™ system. Generally, the remote NetVX™ must be configured to send fewer FEC-enabled VCs to the local GBE-C11 module. Any of the following possibilities may be used.
  (a) Have the transmitter use {none, low, medium} FEC for this channel.
  (b) Have the transmitters for other channels use {none, low, medium} instead of high FEC.

ATM-M11 and ATM-S11-Specific Issues

- Cause: VPI Conflict – This error is raised when more than one VC on the same interface are configured to use the "ATM-VP" function and are configured with the same VPI value.
- Solution: When this trap is raised for an ATM module, change either the function or the VPI of one of the offending ATM VCs.

TMX-M12 Interface-Level PID Conflict: Over-Subscribed PID

- Cause: More than one VC on the interface is attempting to operate on a given PID, thereby causing a PID conflict.
- Solution: On each interface, check the list of Demux VCs for two or more VCs with (a) Their "Function" set to "PID" and, (b) Identical PID values; do the same for the Mux VCs. If any such match is identified, change either the "PID" value to make the PIDs unique, or (if possible) change the VCs function – which will cause the system to disregard the PID value.

TMX-M12 Interface-Level PID Conflict: PID Value Out of Range

- Cause: One of the manually-mapped PID values on this VC is under "16"; values under "16" are reserved. Manually-mapped PID values are specified in the "System" branch under "Program".
- Solution: Verify that none of the manually-specified PID values on this VC are under "16".

TMX-M12 Interface: Attempting to Statmux Data from a Remote Encoder

- Cause: StatMux was enabled on a VC receiving data from a source other than a local encoder.
- Solution: Disable StatMux on the VC causing this alarm.

TMX-M12 Interface: Mis-Configured VC Program Number

- Cause: The VC's function is set to PID, but a program number, other than zero, is specified for the VC.
- Solution: Either change the VC's function from "PID" to "Program", or change the VC's program number to zero.

Additional Information: [Value 6]

Trap Name: **VC Degrade - Loss of Receive Continuity**
MIB Numbers: 65, 66
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Virtual Channel Number: [Value 3]
Virtual Channel Type: [Value 5]
Description: Indicates a loss of continuity count cells. Typically this implies that there has been a loss of connection between the transmission source and this device.
Additional Information: [Value 6]
CorrectiveAction(s):
1 Verify this error condition with your network operations center or service provider.
2 If possible, reconfigure the signal on each end to use a non-affected virtual channel.

Trap Name: **VC Degrade - No Destination**
MIB Numbers: 83, 84
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates one of the following:
- A lack of a route to a destination.
- In the case of an IP VC using UDP, transmission to a UDP port that is not configured.

Additional Information: [Value 6]
CorrectiveAction(s):
1 Verify that the necessary virtual channels and cross connections are present to accommodate reaching the desired destination.
2 Verify that the target IP address and UDP port are configured.

Trap Name: **VC Degrade - Receive Buffer Overflow**
MIB Numbers: 67, 68
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Virtual Channel Number: [Value 3]
Virtual Channel Type: [Value 5]
Description: Indicates that the rate at which data on this VC is received from the network is higher than the provisioned (expected) receive bit rate. This situation causes the ATM input's policing function to discard cells.
Additional Information: [Value 6]
CorrectiveAction(s): Reconcile the rate at the (remote) source and the VC's provisioned receive bit rate by changing the one to match the other.

Trap Name: **VC Degrade - Transmit Buffer Overflow**
MIB Numbers: 69, 70
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Virtual Channel Number: [Value 3]
Virtual Channel Type: [Value 5]
Description: Indicates that the rate at which data on this VC is received by the ATM transmit buffer is higher than the provisioned transmit bit rate. This situation causes the ATM output's policing function to discard cells.
Additional Information: [Value 6]
CorrectiveAction(s): Reconcile the rate at the (local) source and the VC's provisioned transmit bit rate by changing the one to match the other.

Trap Name: **VC Degrade - Transport Stream Error**
MIB Numbers: 87, 88
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Description: Indicates errors in a transport stream processed by the TMX-M12. Errors causing this alarm may include any of the following:

- The VC responsible for carrying this transport stream experiences a degrade condition.
- A program is not present.
- System information tables have continuity count errors.
- System information tables have CRC errors.
- The PAT is missing form the transport stream.

Additional Information: [Value 6]
CorrectiveAction(s):

- Check the configuration of any cross connection responsible for carrying a signal to the TMX-M11.
- Check the TMX-M11's physical input connections.
- Check the configuration of any VCs responsible for carrying this transport stream's signal.
- If the signal originates on an encoder, check the encoder's provisioning and its input wiring.

25.2.15 VC Fault Alarm

Trap Name: **VC Fault - Transport Stream Error**
MIB Numbers: 120, 121
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Virtual Channel Number: [Value 3]
Virtual Channel Type: [Value 5]
Description: Indicates a fault on the specified IP or ATM VC. This fault can result from any of the following causes.
- The received transport stream rate is not constant or goes to zero.
- No PCR values can be found to estimate the transport stream rate.

Additional Information: [Value 6]
CorrectiveAction(s):
- Verify that the source is providing a constant bit rate (CBR) stream.
- Verify that the source is providing a transport stream. Verify the that the transport stream is present on any intermediate links.

25.2.16 Video Degrade Alarms

Trap Name: **Video Degrade - EDH Error**
MIB Numbers: 71, 72
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Description: Indicates EDH line or path errors in incoming video.
Additional Information: [Value 6]
CorrectiveAction(s): Check the cabling feeding the encoder.

Trap Name: **Video Degrade - Sync Error**
MIB Numbers: 73, 74
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Description: Indicates sync errors in incoming video.
Additional Information: [Value 6]
CorrectiveAction(s): Check the cabling feeding the encoder.

25.2.17 Video Fault Alarm

Trap Name: **Video Fault - Loss of Video**
MIB Numbers: 75, 76
Message: [Message]
Variables: Trap Count Number: [Value 1]
Slot Number: [Value 2]
Encoder Number: [Value 3]
Description: Indicates a loss of the encoder's video signal.
Additional Information: [Value 6]
CorrectiveAction(s): 1 Check the cabling feeding the encoder.
2 Check the video source.

25.2.18 Start Up Traps

Trap Name: **Cold Start Trap**
MIB Numbers: None
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: This trap indicates the time at which the system was started or power-cycled.
Additional Information: [Value 6]

Trap Name: **Warm Start Trap**
MIB Numbers: None
Message: [Message]
Variables: Trap Count Number: [Value 1]
Description: This trap indicates the time at which the system was reset.
Additional Information: [Value 6]

25.3 NetVX™ Trap Variable Definitions

This section describes the variables displayed in each NetVX™ trap message.

25.3.1 Trap Count Number

This variable provides a counter that is maintained by the system controller and is increased by “1” whenever a new trap is sent. This counter is set to “0” whenever the system controller is reset, powered up, or service switched.

This count is maintained by each system controller. Therefore, if you monitor more than one system, you may receive identical trap count numbers.

System Controller Modules: 1 = IP VC

25.3.2 Slot Number

This variable indicates any slot numbers associated with a trap. Most traps reference a single module.

25.3.3 From: Slot Number

This variable is applicable only to traps indicating failover and failback operations. In a trap message, this variable represents the number of the slot “from which” active operation or service is transferred.

25.3.4 To: Slot Number

This variable is applicable only to traps indicating failover and failback operations. In a trap message, this variable represents the number of the slot “to which” active operation, or service, is transferred.

25.3.5 From Slot State:

This variable indicates the state that the slot was originally in.

25.3.6 To Slot State:

This variable indicates the state that the slot was moved to.

25.3.7 Reset Description

Indicates the reason for the module reset.

25.3.8 Encoder Number

Identifies the number of the encoder causing a trap. This value is always one for the ENC-S11 because this module has only one encoder.

25.3.9 Decoder Number

Identifies the number of the decoder causing a trap. This value is always one for the DEC-S11 because this module has only one decoder.

25.3.10 Audio Channel Number

This variable helps report a condition specific to an audio channel. Used with the slot number, it uniquely identifies the affected audio channel.

1 = Primary Audio Channel

2 = Secondary Audio Channel

25.3.11 Virtual Channel Number

Identifies the VC causing a trap.

25.3.12 Virtual Channel Type

Identifies the type of VC causing a trap. Note the type of module emitting the trap and refer to the table below.

ATM-x11 Modules: 1 = ATM VC

TMX-M11 Modules: 1 = Demux VC, 2 = Mux VC

25.3.13 Cross Connection Number

Identifies the NetVX™ cross connection causing a trap. Indicates he number of a cross connection involved in the cause of a trap condition. Typically the cross connection number is presented in the case of a signal having failed over from one cross connection to another due to some sort of failure. In the this trap two cross connection numbers are presented, one for the original connection and another for the backup.

25.3.14 Fan Number

Identifies a fan that has failed

1 = The fan located on the right when looking at the system from the rear

2 = The fan located on the left when looking at the system from the rear.

25.3.15 Interface Number

The system's ATM modules each have two interfaces. This variable identifies the ATM interface causing the trap.

1 = SONET (OC3/SDH) Interface

2 = PDH (DS3/E3) Interface

25.3.16 Serial Port Number

Identifies the serial port causing a trap.

1 = Serial Port 1

2 = Serial Port 2

25.3.17 GPO Number

Identifies the GPO causing a trap.

The indicated number (1-4) is the number of the GPO as labelled on the rear of the system.

25.3.18 Power Supply

Identifies the power supply causing a trap. Labels on the rear of the system indicate the respective power supply locations.

1 = Primary Power Supply

2 = Secondary Power Supply

Chapter 26: NetVX™ Bandwidth

Overview and Management

26

26.1 NetVX™ Backplane Bandwidth Considerations

The NetVX™'s maximum backplane bandwidth is 450 Mbps, however significantly higher rates are possible by planning module locations within the system. Please contact technical support if your application requires a higher rate.

If your application may be nearing the backplane limit, then use the following steps to determine the amount of backplane bandwidth that your system is using.

1. Identify the source of all the cross connections in the system.
2. Identify the rate at which each cross connection's source is providing data. Table 26-1 lists each type of VC that can operate as a cross connection source and it also identifies the configuration parameter used to set the rate. These same rates are listed in the Vidiem™ Element Management System's VC configuration tables and dialogs.
3. Sum the rates identified in Step 2. Include the rate for each cross connection on the system even if more than one cross connection share the same source. This is necessary because (generally) each cross connection consumes some amount of backplane bandwidth.

Table 26-1 Parameters Controlling the Rate of Source VC Bandwidth Contribution to the Backplane

Module Type	Craft Port Rate Parameter	Parameter Control in the Vidiem™ Element Management System
SYS-G10 SYS-A12 SYS-A22	cfg slot.s/ip/vc.m rxrate	Modules > IP Modules > (Double-Click) SYS-###; VC Control > VC Rates; IP TxRate (entry box)
GBE-C11	cfg slot.s/ip/vc.m rxrate	Modules > IP Modules > (Double-Click) GBE-###; VC Control > VC Rates; IP TxRate (entry box)
ENC-S11 ENC-S21 ENC-H11	cfg slot.s/enc.m/pgm tsrate	Modules > Encoders > (Double-Click) ENC-###; Program; TS Rate (box)
ATM-M11 ATM-S11	cfg slot.s/atm/vc.m rxrate	Modules > ATM Interfaces > (Interface) > (Double-Click) VC; VC Control > VC Rates; ATM Rx Rate (entry box)
TMX-M12	cfg slot.s/mux/dxvc.m rate	Modules > TS Demultiplexers > (DX Interface) > (Double-Click) VC > VC Control; Policing Rate (entry box)

Related Topics

- Section 26.2, "NetVX™ Module Bandwidth Usage" on page 456.
- Section 26.3, "Range of NetVX™ Encoder Rates" on page 457.
- Section 26.4, "Overview of the Program Transport Stream Rate" on page 458.
- Section 26.5, "ATM Standards and Rate Calculations" on page 461.

26.2 NetVX™ Module Bandwidth Usage

Each NetVX™ module has its own maximum input and maximum output limits. Table 26-2 characterizes these limits.

Table 26-2 Module Ingress and Egress Bandwidth

Module Type		Maximum Input: (A) From Module to Backplane (Mbps)	Maximum Output: From Backplane to Module (Mbps)
SYS-G10		20.00	20.00
SYS-A12, SYS-A22		12.00	12.00
GBE-C11		450.00	450.00
ENC-S11		400.00 = (50 Mbps x 8 Cross Connections)	Not Applicable
ENC-H11		108.00	Not Applicable
DEC-S11		Not Applicable	66.00
ATM-M11, ATM-S11 (B)	ATM	280.00	160.00
	AAL-1	450.00	193.00
	AAL-5	450.00	193.00
TMX-M12		428.00	428.00

Note: (A) Maximum Input to Backplane: This column includes multicasting. Multicasting on the NetVX™ allows a signal originating on one module to be sent to up to eight other modules.
(B) ATM Modules: Maximum ATM module rates indicate the sum of bandwidth used by both the OC-3 and the DS-3 interfaces.

Related Topics

- Section 26.1, "NetVX™ Backplane Bandwidth Considerations" on page 455.
- Section 26.3, "Range of NetVX™ Encoder Rates" on page 457.
- Section 26.4, "Overview of the Program Transport Stream Rate" on page 458.
- Section 26.5, "ATM Standards and Rate Calculations" on page 461.

26.3 Range of NetVX™ Encoder Rates

The following table describes the range of rates for the NetVX™'s various encoder modules.

Table 26-3 Encoder Transport Stream and Video Rate Ranges

Module Type	Minimum TS Rate	Minimum TS Rate (I-Frame Only)	(A) Maximum Video Rate	Maximum TS Rate
ENC-H11	8.0 Mbps (12.0 Mbps recommended)	25.0 Mbps	(B)	108.0 Mbps
ENC-S11	0.1 Mbps	10.0 Mbps	(C) 50.0 Mbps	70.0 Mbps
ENC-S21	0.1 Mbps	10.0 Mbps	(C) 15.0 Mbps	18.0 Mbps
AUD-D14	0.1 Mbps	N/A	N/A	18.0 Mbps

Note A

- The Video Rate is not explicitly configured on NetVX™ encoders. The Video Rate is determined by the Maximum TS Rate less the various other elements in the stream – as described in Section 26.4, "Overview of the Program Transport Stream Rate" on page 458.
- On all NetVX™ encoders, care should be taken to ensure that at least half of the program bandwidth is allocated to video.

Note B

- The ENC-H11 does not have a hardware-constrained Maximum Video Rate. The ENC-H11's video rate is constrained by the items described in Note (A) above.
- The ENC-H11 can support up to two channels of SMTE-302 audio. However care should be taken to ensure that at least half of the program bandwidth is allocated to video. A large amount of ancillary data or high-bandwidth SMPTE-302 audio can alter this ratio and make it impossible to carry two SMPTE-302 streams. If this is the case, then either remove the second SMPTE-302 audio or increase the overall bandwidth of the program stream.
- The ENC-H11 supports a compressed transport stream of up to 60 Mbps when operating with BISS encryption.

Note C

The ENC-S11 and ENC-S21 both have hardware-constrained Maximum Video Rates.

Related Topics

- Section 26.1, "NetVX™ Backplane Bandwidth Considerations" on page 455.
- Section 26.2, "NetVX™ Module Bandwidth Usage" on page 456.
- Section 26.4, "Overview of the Program Transport Stream Rate" on page 458.
- Section 26.5, "ATM Standards and Rate Calculations" on page 461.

26.4 Overview of the Program Transport Stream Rate

The transport stream bitrate specifies the rate for the entire program. When specifying this rate, the total should be large enough to carry control information and the program components: audio, video, VBI lines, and VANC data. With the exception of video, each of these components has a configuration parameter that either specifies or affects their rate. The encoder subtracts those explicit or implied rate values from this total transport stream rate and assigns the remaining bandwidth to video.

Rates of the following items are subtracted from the Transport Stream rate in order to determine the Video Rate. Each of the items are described in the sections that follow.

- Section 26.4.1, "Program and System Information" on page 458
- Section 26.4.2, "Separate PID" on page 459
- Section 26.4.3, "Frame Completion" on page 459
- Section 26.4.4, "4:2:2 Coding" on page 459
- Section 26.4.5, "Audio Rate" on page 459
- Section 26.4.6, "VBI lines" on page 459
- Section 26.4.7, "Vertical Ancillary Data" on page 459
- Section 26.4.8, "Safety Factor" on page 459
- Section 26.4.9, "Transport Stream Overhead" on page 460
- After all of the above are subtracted from the TS Rate, only the Video Rate is left. See Section 26.4.10, "Video Rate" on page 460 for more detail.

26.4.1 Program and System Information

Program information includes the PAT (program association table) and PMT (program map table). With the exception of PMTs, each program table occupies 1 transport stream packet. Program tables are repeated at an interval that depends on the SI-PSI mode. ATSC requires additional descriptors for the PMT, making it two packets long instead of one. The system information (SI) tables have a variable schedule, so the table below reports the aggregate SI bandwidth.

Table 26-4 Program and System Information Table Rates (SI Bandwidth)

SI Mode	Table	Interval (ms)	Bandwidth (bps)	
ATSC	PAT	95	15,832 bps =	1 * 188 * 8 * 1000 / 95
	PMT	395	7,616 bps =	2 * 188 * 8 * 1000 / 395
	SI	Varied	28,092 bps	Includes tables: STT, MGT, TVCT, EIT-0, EIT-1, EIT-2, and EIT-3.
DVB	PAT	395	3,808 bps =	1 * 188 * 8 * 1000 / 395
	PMT	395	3,808 bps =	1 * 188 * 8 * 1000 / 395
	SI	Varied	6,032 bps	Includes tables: TSDT, TDT, NIT, SDT, and EIT present/following.
MPEG	PAT	95	15,832 bps =	1 * 188 * 8 * 1000 / 95
	PMT	395	3,808 bps =	1 * 188 * 8 * 1000 / 395
	SI	1000	1,504 bps =	1 * 188 * 8 * 1000 / 1000, includes the SDT table.

26.4.2 Separate PID

If the program uses a separate PID for PCRs, that PID carries 1 transport stream packet every 30 milliseconds.

```
50133 bps = 1 * 188 * 8 * 1000 / 30
```

26.4.3 Frame Completion

Frame completion ensures every frame uses full transport stream packets. Combined with picture headers, this uses one and one half packets per frame.

```
67680 bps = 188 * 8 * 1.5 * 30 fps
```

Note: The rate of 30 frames per second is used in this calculation regardless of the actual frame rate.

This amount includes EIA 708 closed captions for VBI line 21 (captions on other lines are counted in the VBI value, given below), or for closed captions received over UDP, depending on the program's closed caption source. The transport stream carries this data, regardless of whether closed captions are received or not. The data occupy 9600 bps, using 3 bytes for every 2 bytes of payload. Prior to version f.g.a, the frame completion and line 21 closed captions were counted separately, contributing (45120 + 37440) bps.

26.4.4 4:2:2 Coding

If the resolution indicates 4:2:2 coding, and pre-processing is enabled, the stream needs one packet per GOP (group of pictures) for chroma quantizer matrixes. See the "cfg slot.s/enc.m/vid res" control on page 234.

```
matrix_rate = 188 * 8 * (29 + gop_size) / gop_size
```

Note: The rate of 30 frames per second is used for rounding regardless of the actual frame rate.

26.4.5 Audio Rate

The Audio Rate is based on the selected audio coding “Standard” (See the "cfg slot.s/enc.m/aud.n standard" control on page 189) and whether the audio channel is enabled (See the "cfg slot.s/enc.m/aud.n state" control on page 195).

The audio rate contributes to the use of the programs overall transport stream bandwidth. Additionally, when one or more AUD-D14 audio channels are associated with an encoder, the additional bandwidth required to support these channels is drawn from the video bit rate.

26.4.6 VBI lines

The amount of data reserved for VBI is based on each line’s function. See the "cfg slot.s/enc.m/vbi/fld.f/lin.l function" control on page 221.

26.4.7 Vertical Ancillary Data

The VANC data rate is a configured parameter. The rates associated with these services must reduce the overall transport stream rate. See the "ENC Vertical Ancillary Data Service Configuration Parameters" control on page 217.

26.4.8 Safety Factor

A safety factor of 1 transport stream packet per picture adds to the TS Rate.

```
45120 bps = 188 * 8 * 30 fps
```

Note: The rate of 30 frames per second is used for rounding regardless of the actual frame rate.

26.4.9 Transport Stream Overhead

Transport Stream overhead (ts_overhead) is one 4-byte transport stream header added for each 188-byte packet of the remaining rate.

```
ts_overhead = ((remaining_ts_rate + 187) / 188) * 4
```

26.4.10 Video Rate

The final video rate should lie between 100,000 and 50,000,000 bps (inclusive).

26.4.11 StatMux and the Transport Stream Rate

When the encoder participates in a statistical multiplexing group, its transport stream rate can vary dynamically. Without statmux, the configured transport stream rate is the maximum stream rate. In a statmux group, however, configured value is taken to be the average stream rate. The statmux controller allocates the group's bandwidth as needed, and the dynamic rate for any encoder can exceed its configured transport stream rate.

Normally, one would not connect a statistically multiplexed encoder to multiple destinations, because of the relaxed constraints on the encoder's output rate. It can be done, but the receivers should be prepared for a rate that varies more widely than a non-multiplexed stream. When multiple connections exist, no more than one can activate dynamic rate control in a statmux group. If multiple connections attempt to enable statmux, the encoder will assert an alarm (modDeg, configuration error).

Related Topics

- Section 26.1, "NetVX™ Backplane Bandwidth Considerations" on page 455.
- Section 26.2, "NetVX™ Module Bandwidth Usage" on page 456.
- Section 26.3, "Range of NetVX™ Encoder Rates" on page 457.
- Section 26.5, "ATM Standards and Rate Calculations" on page 461.

26.5 ATM Standards and Rate Calculations

The following table provides a listing of each of the NetVX™'s ATM interface standards, maximum rate, and supporting rate calculations. The "Standard" column lists each selection available under the "cfg slot.s/atm/ifc.m standard" command.

Table 26-5 Maximum ATM Transmits Rates Based on Standard

Standard	Maximum ATM Rate (Mbps)	Notes and Calculations
ds3-cbit-adm	44.209694	The raw DS3 interface carries 44.736 Mbps. C-bit ATM-Direct-Map carries 680-bit frames with 672 payload bits/ frame. `44.209694 = 44.736 * 672 / 680`
ds3-cbit-plcp	40.704	The raw DS3 interface carries 44.736 Mbps. C-bit PLCP carries 8000 frames per second, each with 12 ATM cells. `40.704 = 8000 * 12 * 53 * 8`
ds3-m23-adm	44.209694	The raw DS3 interface carries 44.736 Mbps. M23 ATM-Direct-Map carries 680-bit frames with 672 payload bits/frame. `44.209694 = 44.736 * 672 / 680`
ds3-m23-plcp	40.704	The raw DS3 interface carries 44.736 Mbps. M23 PLCP carries 8000 frames per second, each with 12 ATM cells. `40.704 = 8000 * 12 * 53 * 8`
e3-751-adm	33.792	G.751 ATM-Direct-Map carries four 8.448 Mbps tributaries. `33.792 = 4 * 8.448`
e3-751-plcp	30.528	G.751 PLCP carries 8000 frames per second; each frame has 9 ATM cells. `30.528 Mbps = 8000 * 9 * 53 * 8`
e3-832-adm	33.920	G.852 ATM-Direct-Map carries 8000 frames per second, each with 10 ATM cells. `33.920 = 8000 * 10 * 53 * 8`
SDH, SONET	149.760	The raw OC-3 interface carries 155.520 Mbps. SONET and SDH use 270-byte lines carrying 260 bytes of payload. `149.760 = 155.520 * 260 / 270`

Related Topics

- Section 26.1, "NetVX™ Backplane Bandwidth Considerations" on page 455.
- Section 26.2, "NetVX™ Module Bandwidth Usage" on page 456.
- Section 26.3, "Range of NetVX™ Encoder Rates" on page 457.
- Section 26.4, "Overview of the Program Transport Stream Rate" on page 458.

Appendix A: Laser Safety Guidelines

For NetVX™ Video Networking System ATM & GBE Modules

A

A.1 General Laser Information

Optical fiber telecommunication systems, their associated test sets, and similar operating systems use semiconductor laser transmitters that emit infrared (IR) light at wavelengths between approximately 800 nanometers and 1600 nanometers. The emitted light is above the red end of the visible spectrum, which is normally not visible to the human eye. Although radiant energy at near-IR wavelengths is officially designated invisible, some people can see the shorter wavelength energy even at power levels several orders of magnitude below any that have been shown to cause injury to the eye.

Conventional lasers can produce an intense beam of monochromatic light. The term monochromaticity means a single wavelength output of pure color that may be visible or invisible to the eye. A conventional laser produces a small-size beam of light, and because the beam size is small the power density (also called irradiance) is very high. Consequently, lasers and laser products are subject to federal and applicable state regulations as well as international standards for their safe operation.

A conventional laser beam expands very little over distance, or is said to be very well collimated. Thus, conventional laser irradiance remains relatively constant over distance. However, lasers used in lightwave systems have a large beam divergence, typically 10 to 20 degrees. Here, irradiance obeys the inverse square law (doubling the distance reduces the irradiance by a factor of 4 and rapidly decreases over distance.

A.2 Lasers and Eye Damage

The optical energy emitted by laser and high-radiance LEDs in the 400-1400 nm range may cause eye damage if absorbed by the retina. When a beam of light enters the eye, the eye magnifies and focuses the energy on the retina magnifying the irradiance. The irradiance of the energy that reaches the retina is approximately 10^5 or 100,000 times more than at the cornea and, if sufficiently intense, may cause a retinal burn.

The damage mechanism at the wavelengths used in an optical fiber telecommunications is thermal in origin i.e., damage caused by heating. Therefore, a specific amount of energy is required for a definite time to heat an area of retinal tissue. Damage to the retina occurs only when one looks at the light sufficiently long that the product of the retinal irradiance and the viewing time exceeds the damage threshold. Optical energies above 1400 nm cause corneal and skin burns but do not affect the retina. The thresholds for injury at wavelengths greater than 1400 nm are significantly higher than for wavelengths in the retinal hazard region

A.3 Classification of Lasers

Manufacturers of lasers and laser products in the U.S. are regulated by the Food and Drug Administration's Center for Devices and Radiological Health (FDA/CDRH) under 21 CFR 1040. These regulations require manufacturers to certify each laser or laser product as belonging to one of four major Classes I, II, lla, IIIa, lllb, or IV. The International Electro-technical Commission is an international standards body that writes laser safety standards under IEC-60825. Classification schemes are similar with Classes divided into Classes 1, 2, 3A, 3B, and 4. Lasers are classified according to the accessible emission limits and their potential for causing injury. Optical fiber telecommunication systems are generally classified as Class I/1, because, under normal operating conditions, all energized laser transmitting circuit packs are terminated on optical fibers which enclose the laser energy with the fiber sheath forming a protective housing. Also, a protective housing / access panel is typically installed in front of the laser circuit pack shelves. The circuit packs themselves, however, may be FDA/CDRH Class I or IIIb or IEC Class 1, 3A, or 3B.

A.4 Laser Safety Precautions for Optical Fiber Telecommunication Systems

In its normal operating mode, an optical fiber telecommunication system is totally enclosed and presents no risk of eye injury. It is a Class I/1 system under the FDA and IEC classifications.

The fiber optic cables that interconnect various components of an optical fiber can disconnect or break, and may expose people to laser emissions. Also, certain measures and maintenance procedures may expose the technician to emission from the semiconductor laser during installation and servicing. Unlike more familiar laser devices, such as solid-state and gas lasers, the emission pattern of a semiconductor laser results in a highly divergent beam. In a divergent beam, the irradiance (power density) decreases rapidly with distance. The greater the distance, the less energy will enter the eye, and the less potential risk for eye injury.

Inadvertently viewing an unterminated fiber or damaged fiber with the unaided eye at distances greater than 5 to 6 inches normally will not cause eye injury provided the power in the fiber is less than a few milliwatts at the near IR wavelengths and a few tens of milliwatts at the far IR wavelengths. However, damage may occur if an optical instrument such as a microscope, magnifying glass or eye loupe is used to stare at the energized fiber end.

⚠ CAUTION!

Use of controls, adjustments and procedures other than those specified herein may result in hazardous laser radiation exposure.

A.5 Laser Safety Precautions for Enclosed Systems

Under normal operating conditions, optical fiber telecommunication systems are completely enclosed; nonetheless, the following precautions shall be observed:

1. Because of the potential for eye damage, technicians should not stare into optical connectors or broken fibers.
2. Under no circumstance shall laser/fiber optic operations be performed by a technician before satisfactorily completing an approved training course.
3. Since viewing laser emissions directly in excess of Class I/1 limits with an optical instrument such as an eye loupe greatly increases the risk of eye damage, appropriate labels must appear in plain view, in close proximity to the optical port on the protective housing/access panel of the terminal equipment.

A.6 Laser Safety Precautions for Unenclosed Systems

During service, maintenance, or restoration, an optical fiber telecommunication system is considered unenclosed. Under these conditions, follow these practices:

1. Only authorized, trained personnel shall be permitted to do service, maintenance and restoration. Avoid exposing the eye to emissions from unterminated, energized optical connectors at close distances. Laser modules associated with the optical ports of laser circuit packs are typically recessed, which limits the exposure distance. Optical port shutters, Automatic Power Reduction (APR), and Automatic Power Shut Down (APSD) are engineering controls that are also used to limit the emissions. However, technicians removing or replacing laser circuit packs should not stare or look directly into the optical port with optical instruments or magnifying lenses. (Normal eye-wear or indirect viewing instruments such as Find-R-Scopes are not considered magnifying lenses or optical instruments.
2. Only authorized, trained personnel shall use optical test equipment during installation or servicing since this equipment contains semiconductor lasers. (Some examples of optical test equipment are Optical Time Domain Reflectometers (OTDR's), Hand-Held Loss Test Sets, and Feature Finders.
3. Under no circumstances shall any personnel scan a fiber with an optical test set without verifying that all laser sources on the fiber are turned off.
4. All unauthorized personnel shall be excluded from the immediate area of the optical fiber telecommunication systems during installation and service.

Consult ANSI Z136.2 American National Standard for Safe Use of Lasers in the U.S. or outside the U.S., IEC-60825, Part 2 for guidance on the safe use of optical fiber optic communication systems in the workplace.

A.7 Optical Specifications of the NetVX™ Video Networking System

A.7.1 FDA-Approved NetVX™ ATM-M11/ATM-S11 Modules

The following Harris Corporation NetVX™ modules comply with FDA/CDRH 21 CFR 1040.10 and 1040.11 as Class I and IEC 60825-2 as a Hazard Level 1 Optical Fiber Video/Audio System.

Table A-1 NetVX™ Video Networking System Internal Laser Circuit Packs

Laser Circuit Pack Code	Wavelength (nm)	Output Power (mW)	Fiber Type Core/ Cladding Diameter (μm)	Connector Type	FDA Class/ IEC Hazard Level
ATM-S11	1300	0.158	SM (8.3/125)	SC	I/1
ATM-M11 (LED)*	1300	0.039	MM (62.5/125)	SC	I/1

* FDA/CDRH does not require certification of LED products.

A.7.2 FDA-Approved Third-Party SFP Modules

Harris Corporation has qualified the following SFP modules for use in its GBE-C11 and ATM-X11 modules.

The manufacturers of these SFP modules have assured Harris that their modules comply with FDA/CDRH 21 CFR 1040.10 and 1040.11 as
Class I and IEC 60825-2 as a Hazard Level 1 Optical Fiber Video/Audio System.

Note: The use of the following SFP modules within either the GBE-C11 or the ATM-X11 is pending FDA approval.

Table A-2 NetVX™ Video Networking System Approved Third-Party Laser SFP Modules

OEM Information for SFP Laser Module	Wavelength (nm) Min.–Max. Center	Output Power (dBm)	Fiber Type Core/ Cladding Diameter (μm)	Connector Type	FDA Class/ IEC Hazard Level
Used in Harris Product: GBE-C11 Manufacturer: Stratos Lightwave Model: SPLC-20-4-1-B Laser Type: Multi-Mode	830–860 850	-9.5 to -2.0	MMF/50.0 or 62.5	LC	I/1
Used in Harris Product: GBE-C11 Manufacturer: Stratos Lightwave Model: SPLC-20-4D-2M-B Laser Type: Single-Mode	1285–1335 1310	-9.5 to -3.0	SMF/9.0	LC	I/1
Used in Harris Product: ATM-X11 Manufacturer: Stratos Lightwave Model: SPLC-20-2-4-B-R6 SFP Laser Type: Multi-Mode	1260–1360 1310 (typical)	-20 to -14	MMF/50.0 or 62.5	LC	I/1
Used in Harris Product: ATM-X11 Manufacturer: Stratos Lightwave Model: SPLC-20-2-2M-B-R6 SFP Laser Type: Single-Mode, 15 Kilometer Intermediate-Reach	1266–1360 1310 (typical)	-15.0 to -8.0	SM	LC	I/1
Used in Harris Product: ATM-X11 Manufacturer: Opnext Model: TRF5456AVLB300 SFP Laser Type: Single-Mode, 40 Kilometer Long-Reach	1263–1360	-5 to 0	SM	LC	I/1

Appendix B: NetVX™ Parts List

B

Abstract: *This chapter provides an aggregate list of the part number referenced in the preceding chapters of this book. Some items that support more than one module are listed more than once.*

Use the following list when ordering hardware components described in this manual.

Part	Description
SYS-200-STD	NetVX™ chassis with two factory-configured (non-user serviceable) application module slots, AC power, and an internal TMX-M12-TNL2 module. 36
SYS-200-MUX	NetVX™ chassis with two factory-configured (non-user serviceable) application module slots, AC power, and an internal TMX-M12-MUX module. 36
SYS-VIP-KEY	Software key enabling Video on IP features on the system controller. 36
SYS-IPOA-KEY	Software key enabling IP Over ATM (IPOA) features. 36

Part	Description
SYS-350-AC	See Table 4-3 NetVX™ SYS-350 Chassis Type Definitions on page 41 for details. 46
SYS-350-AC-STD	See Table 4-3 NetVX™ SYS-350 Chassis Type Definitions on page 41 for details. 46
SYS-350-AC-IA	See Table 4-3 NetVX™ SYS-350 Chassis Type Definitions on page 41 for details. 46
SYS-350-AC-IA-VI	See Table 4-3 NetVX™ SYS-350 Chassis Type Definitions on page 41 for details. 46
SYS-350-AC-VI	See Table 4-3 NetVX™ SYS-350 Chassis Type Definitions on page 41 for details. 46
SYS-350-AC-MHE	See Table 4-3 NetVX™ SYS-350 Chassis Type Definitions on page 41 for details. 46
SYS-350-AC-MHES	See Table 4-3 NetVX™ SYS-350 Chassis Type Definitions on page 41 for details. 46
PWR-CRD-120	120V AC Power Cord (NEMA 5-15P/IEC320 C-13). 46
PWR-CRD-220	220V AC Power Cord with wire ends. 46
	Reference Input Cable. Adapts SMB to BNC. 46

SYS-1700 Part	Description
SYS-1700-AC-STD-IA	See Table 5-3 SYS-1700 Chassis Types and Features on page 52 for details. 59
SYS-1700-AC-STD-VIP	See Table 5-3 SYS-1700 Chassis Types and Features on page 52 for details. 59
SYS-1700-AC-MHE	See Table 5-3 SYS-1700 Chassis Types and Features on page 52 for details. 59
SYS-1700-AC-MHES	See Table 5-3 SYS-1700 Chassis Types and Features on page 52 for details. 59
SYS-1700-DC-STD-IA	See Table 5-3 SYS-1700 Chassis Types and Features on page 52 for details. 59
SYS-1700-DC-STD-VIP	See Table 5-3 SYS-1700 Chassis Types and Features on page 52 for details. 59
SYS-1700-DC-MHE	See Table 5-3 SYS-1700 Chassis Types and Features on page 52 for details. 59
SYS-1700-DC-MHES	See Table 5-3 SYS-1700 Chassis Types and Features on page 52 for details. 59

SYS-1700 Parts	Description	
FAN-S10	Replaceable Fan Unit (2 per system)	59
FLT-001	Air Filter Assembly	59
CIB-S10	Front Panel Controller Assembly	59
RCB-S10	Rear Connector Board Assembly	59
EAR-TYS	Universal Rack-mount ears	59
FLT-001	Air Filter	59
PAN-B04	4HP Blank Filler Panel (1 module width)	59
PAN-B08	8HP Blank Filler Panel (1 power supply width)	59
PAN-B16	16HP Blank Filler Panel (4 module widths)	59
PWR-AC1	AC Power Supply 90–264V, 3.2A (max) 47–63Hz	59
PWR-CRD-120	120V AC Power Cord (NEMA 5-15P/IEC320 C-13)	59
PWR-CRD-220	220V AC Power Cord with wire ends	59
PWR-FUS-AC	Extra fuses for the SYS-1700-AC	59
PWR-DC1	DC Power Supply 36–72V, 7.9A	59
PWR-CRD-48	48V DC Power Cord	59
PWR-FUS-DC	Extra fuses for the SYS-1700-DC	59

Part	Description	
SYS-A12-CTL	System Controller Module	78
CBA-HD25M-2DB9M	DB-25 Breakout Cable	78

Part	Description	
SYS-A22-CTL	System Controller Module	81
CBAHD15M-2DB9M	HD-15 breakout cable	81

Part	Description	
ATM-M11	Base Multi-Mode ATM Network Interface Module	86
ATM-S11	Base Single-Mode ATM Network Interface Module	86
ATM-M11-1	Multi-Mode ATM Network Interface Module Feature Key	86
ATM-S11-1	Single-Mode ATM Network Interface Module Feature Key	86
ATM-M11-1A1	Multi-Mode ATM Network Interface Module Feature Key	86
ATM-S11-1A1	Single-Mode ATM Network Interface Module Feature Key	86
ATM-M11-2	Multi-Mode ATM Network Interface Module Feature Key	86
ATM-S11-2	Single-Mode ATM Network Interface Module Feature Key	86
ATM-M11-2A1	Multi-Mode ATM Network Interface Module Feature Key	86
ATM-S11-2A1	Single-Mode ATM Network Interface Module Feature Key	86

Harris Part Number	SFP Description	SFP Manufacturer	SFP Manufacturer

Part #			
ATM-X11	Base ATM Network Interface Module—	—	94
ATM-X11-1	This model does not include an SFP module.—	—	94
ATM-X11-1A1	This model does not include an SFP module.—	—	94
ATM-X11-M1	SFP w/Multi-Mode Laser	Stratos Lightwave	SPLC-20-2-4-B-R6	94
ATM-X11-M1A1	SFP w/Multi-Mode Laser	Stratos Lightwave	SPLC-20-2-4-B-R6	94
ATM-X11-M2	SFP w/Multi-Mode Laser	Stratos Lightwave	SPLC-20-2-4-B-R6	94
ATM-X11-M2A1	SFP w/Multi-Mode Laser	Stratos Lightwave	SPLC-20-2-4-B-R6	94
ATM-X11-S1	SFP w/15 Kilometer Intermediate-Reach Laser	Stratos Lightwave	SPLC-20-2-2M-B-R6	94
ATM-X11-S1A1	SFP w/15 Kilometer Intermediate-Reach Laser	Stratos Lightwave	SPLC-20-2-2M-B-R6	94
ATM-X11-S2	SFP w/15 Kilometer Intermediate-Reach Laser	Stratos Lightwave	SPLC-20-2-2M-B-R6	94
ATM-X11-S2A1	SFP w/15 Kilometer Intermediate-Reach Laser	Stratos Lightwave	SPLC-20-2-2M-B-R6	94
ATM-X11-L1	SFP w/40 Kilometer Long-Reach Laser	Opnext	TRF5456AVLB300	94
ATM-X11-L1A1	SFP w/40 Kilometer Long-Reach Laser	Opnext	TRF5456AVLB300	94
ATM-X11-L2	SFP w/40 Kilometer Long-Reach Laser	Opnext	TRF5456AVLB300	94
ATM-X11-L2A1	SFP w/40 Kilometer Long-Reach Laser	Opnext	TRF5456AVLB300	94
ATM-X11-E1	STM-1e(ES1) SFP	Teridian	SFP-6500-08	94
ATM-X11-E1A1	STM-1e(ES1) SFP	Teridian	SFP-6500-08	94
ATM-X11-E2	STM-1e(ES1) SFP	Teridian	SFP-6500-08	94
ATM-X11-E2A1	STM-1e(ES1) SFP	Teridian	SFP-6500-08	94

Part	Description		
ATM-X11-STMCBL	DIN 1.0/2.3 (75 Ohm) Type D to BNC Coax Cable	Response Microwave	RMCA39.BNC.1.0	94
ATM-X11-STM1E	STM-1e(ES1) SFP	Teridian	SFP-6500-08	94
			94

Part	Description	
GBE-C11-LAN	Gigabit Ethernet Network Interface Module Feature Key	100
GBE-C11-LANTS	Gigabit Ethernet Network Interface Module Feature Key	100
GBE-C11-VIPA	Gigabit Ethernet Network Interface Module Feature Key	100
GBE-C11-STD	Gigabit Ethernet Network Interface Module	100

Harris Part Number	Description	Manufacturer	Part Number	
GBE-OPT-SM	Single-Mode SFP Module	Stratos Lightwave	SPLC-20-4D-2M-B	100
GBE-OPT-MM	Multi-Mode SFP Module.	Stratos Lightwave	SPLC-20-4-1-B	100

Part	Description	
ENC-S11	Base MPEG-2 Encoder Module	108
ENC-S11-UTIL-M	MPEG-2 Standard-Definition Encoder Module Feature Key	108
ENC-S11-STD-M	MPEG-2 Standard-Definition Encoder Module Feature Key	

108
ENC-S11-STD-MC .....MPEG-2 Standard-Definition Encoder Module Feature Key..... .....
108
ENC-S11-STD-D .....MPEG-2 Standard-Definition Encoder Module Feature Key..... .....
108
ENC-S11-STD-DC .....MPEG-2 Standard-Definition Encoder Module Feature Key..... .....
108
ENC-S11-PRO-M .....MPEG-2 Standard-Definition Encoder Module Feature Key..... .....
108
ENC-S11-PRO-D .....MPEG-2 Standard-Definition Encoder Module Feature Key..... .....
108
ENC-S11-PRO-DM .....MPEG-2 Standard-Definition Encoder Module Feature Key..... .....
108
ENC-S11-PRO-MC .....MPEG-2 Standard-Definition Encoder Module Feature Key..... .....
108
ENC-S11-PRO-DC.....MPEG-2 Standard-Definition Encoder Module Feature Key..... .....
108
ENC-S11-PRO-DMC.....MPEG-2 Standard-Definition Encoder Module Feature Key..... .....
108

Part **Description**

AAC-1MF .....Audio cable with 15-pin D-subminiature connector and four female XLR connectors. .....
108
AAC-3ML.....Audio cable with 15-pin D-subminiature connector and wire leads.....
108

Part **Description**

ENC-S21 .....Base MPEG-2 Standard-Definition Encoder Module..... .....
117
ENC-S21-STD-M .....MPEG-2 Standard-Definition Encoder Module Feature Key..... .....
117
ENC-S21-STD-D.....MPEG-2 Standard-Definition Encoder Module Feature Key..... .....
117
ENC-S21-STD-DM.....MPEG-2 Standard-Definition Encoder Module Feature Key..... .....
117

Part **Description**

AAC-1MF .....Audio cable with 15-pin D-subminiature connector and four female XLR connectors. .....
118
AAC-3ML.....Audio cable with 15-pin D-subminiature connector and wire leads.....
118

Part **Description**

ENC-H11 .....Base MPEG-2 High-Definition Encoder Module..... .....
125
ENC-H11-STD-M .....MPEG-2 High-Definition Encoder Module Feature Key..... .....
125
ENC-H11-STD-D.....MPEG-2 High-Definition Encoder Module Feature Key..... .....

125
ENC-H11-DVBT .....MPEG-2 High-Definition Encoder Module Feature Key..... .....
125
ENC-H11-ATSC.....MPEG-2 High-Definition Encoder Module Feature Key..... .....
125
ENC-H11-PRO-M.....MPEG-2 High-Definition Encoder Module Feature Key..... .....
125
ENC-H11-PRO-D .....MPEG-2 High-Definition Encoder Module Feature Key..... .....
125
ENC-H11-PRO-DM .....MPEG-2 High-Definition Encoder Module Feature Key..... .....
125
ENC-H11-PRO-MC .....MPEG-2 High-Definition Encoder Module Feature Key..... .....
125
ENC-H11-PRO-DC.....MPEG-2 High-Definition Encoder Module Feature Key..... .....
125
ENC-H11-PRO-DMC.....MPEG-2 High-Definition Encoder Module Feature Key..... .....
125

Part	Description

ENC-A21 .....Base MPEG-4 Part 10/H.264 HD/SD Encoder Module..... .....
131

MPEG-4 Part 10/H.264 High-Definition Encoders

ENC-A21-HD.....MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key .....
131
ENC-A21-HD-M .....MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key .....
131
ENC-A21-HD-D.....MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key .....
131
ENC-A21-HD-P .....MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key .....
131
ENC-A21-HD-MP .....MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key .....
131
ENC-A21-HD-DP .....MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key .....
131
ENC-A21-HD-MC.....MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key .....
131
ENC-A21-HD-DC .....MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key .....
131
ENC-A21-HD-DM.....MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key .....
131
ENC-A21-HD-DMC .....MPEG-4 Part 10/H.264 High-Definition Encoder Module Feature Key .....
131

MPEG-4 Part 10/H.264 Standard-Definition Encoders

ENC-A21-SD.....MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key .....
131
ENC-A21-SD-M.....MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key .....

131
ENC-A21-SD-D .....MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key .....
131
ENC-A21-SD-P .....MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key .....
131
ENC-A21-SD-MP .....MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key .....
131
ENC-A21-SD-DP.....MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key .....
131
ENC-A21-SD-MBL .....MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key .....
131
ENC-A21-SD-MC .....MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key .....
131
ENC-A21-SD-DC .....MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key .....
131
ENC-A21-SD-DM .....MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key .....
131
ENC-A21-SD-DMC .....MPEG-4 Part 10/H.264 Standard-Definition Encoder Module Feature Key .....
131
....131

Part	Description

AUD-D14.....Base Four-Channel Audio Encoder/Decoder Module..... .....
136
AUD-D14-DEC .....Four-Channel Audio Encoder/Decoder Module Feature Key..... .....
136
AUD-D14-ENC-D .....Four-Channel Audio Encoder/Decoder Module Feature Key..... .....
136
AUD-D14-ENC-M.....Four-Channel Audio Encoder/Decoder Module Feature Key..... .....
136
AUD-D14-ENC-DM .....Four-Channel Audio Encoder/Decoder Module Feature Key..... .....
136

Part	Description

DEC-S11 .....Base MPEG-2 Standard Definition Decoder Module..... .....
142
DEC-S11-STD .....MPEG-2 Standard-Definition Decoder Module Feature Key..... .....
142
DEC-S11-STD-D .....MPEG-2 Standard-Definition Decoder Module Feature Key..... .....
142
DEC-S11-STD-PRO .....MPEG-2 Standard-Definition Decoder Module Feature Key..... .....
142
DEC-S11-STD-PRO-D ....MPEG-2 Standard-Definition Decoder Module Feature Key..... .....
142

Part	Description

AAC-1MM.....Audio cable with 15-pin D-subminiature connector and four male XLR connectors. .....
142
AAC-3ML.....Audio cable with 15-pin D-subminiature connector and wire leads.....

142

Part	Description	
TMX-M12	Base MPEG-2 Transport Stream Multiplexer	150
TMX-M12-TNL1	MPEG-2 Transport Stream Multiplexer Feature Key	150
TMX-M12-TNL2	MPEG-2 Transport Stream Multiplexer Feature Key	150
TMX-M12-MUX	MPEG-2 Transport Stream Multiplexer Feature Key	150

Part	Description	
TMX-M14	Base MPEG-2 Transport Stream Multiplexer	154
TMX-M14-TNL4	MPEG-2 Transport Stream Multiplexer Feature Key	154

Appendix C: Firmware Upgrade Procedure

C

C.1 Purpose

The NetVX™ is shipped from the factory pre-loaded with the latest available firmware. This procedure explains how to upgrade the NetVX™'s firmware to a later version.

- Use the "Upgrade.exe" utility to copy new firmware files on to the NetVX™.
  The "Upgrade.exe" utility is included on the NetVX™ firmware installation CD.
- Use either the Vidiem™ Element Management System or the craft port/telnet interface to cause the NetVX™ to cut over and begin using the new firmware.

Prerequisites

- The NetVX™ targeted for upgrade must be configured with an IP address. See Section , "Step 5: IP Address Configuration" on page 62 for instructions.
- The PC used to run Upgrade.exe must have IP connectivity (usually over Ethernet) to the NetVX™.
- Microsoft Internet Explorer (IE) 5.0 or higher must be installed on the PC used to run the Upgrade.exe utility. IE 5.5 is required for full functionality.
- When upgrading a NetVX™ that uses a redundant SYS-A12 module, the SYS-A12 module in slot 1 must be the active system controller. Additional steps required to perform a non-service affecting upgrade are provided in the following sections.
  - Section C.4, "Step III: Using Vidiem – Final Upgrade Steps for Dual-System Controller Systems" on page 479.
  - Section C.6, "Step III: Using the Craft Port – Final Upgrade Steps for Dual-System Controller Systems" on page 481.

If using the Vidiem™ Element Management System...

- Vidiem™ Element Management System 2.1 or later must be installed on a PC with IP access to the target NetVX™.
- The Vidiem™ Element Management System's device list must contain an entry for the target NetVX™. See the Vidiem™ Element Management System's online help topic "How to Add a Device to the Device List" if you need assistance.

C.2 Step I: Use the Upgrade.exe Utility to Copy New Firmware

The NetVX™ has limited space for firmware loads. Use the next couple steps to ensure the system has sufficient space for the firmware you are about to load.

1. In the Vidiem™ Element Management System, open the target NetVX™ and read its settings. Read the system's settings by either "Device > Read" from the menubar, or by pressing the "Read Device" button in the toolbar.
2. In the navigation tree, select "Utilities + (right click) Properties > Firmware" to open the Firmware dialog.

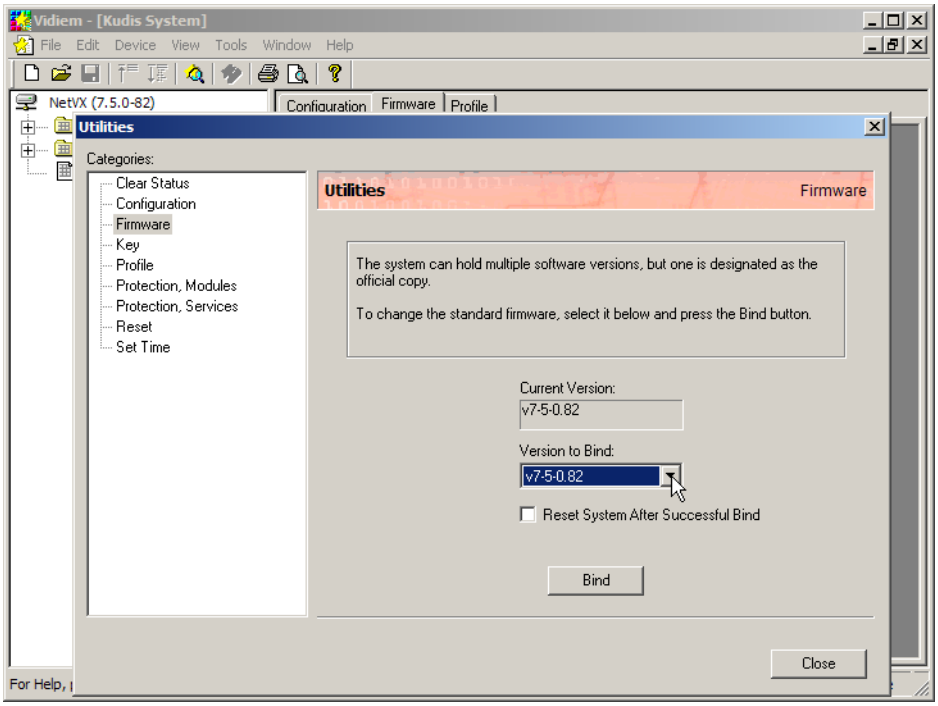

Figure C-1 Utilities Firmware Dialog

3. In the Firmware dialog, note the 'Current Version' and select the exact same version in the 'Version to Bind' drop down.
4. Click the 'Bind' button to bind the system to this version of firmware. This step also causes the system to delete all non-'current' and non- 'previous' versions of firmware thereby ensuring sufficient space to load firmware (as directed in the next steps).

The 'Upgrade.exe' utility copies firmware from the release CD to the NetVX™ system.

5. Put the NetVX™ firmware installation CD in the PC CD ROM drive.

6 Double-click the “Upgrade.exe” program located at the root of the CD directory.

```
D:\Upgrade.exe
```

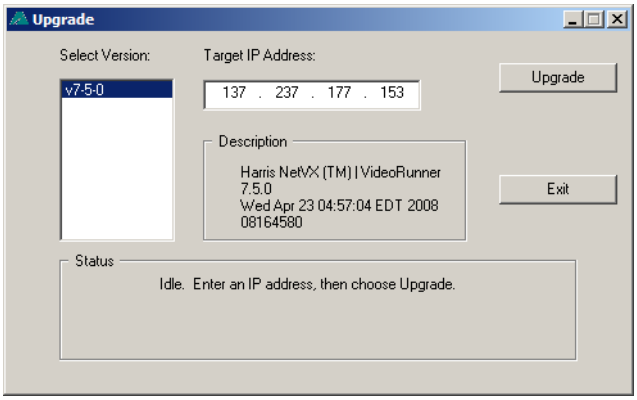

Figure C-2 Upgrade Utility Screen

7 Select the firmware version to load onto the NetVX™ from the ‘Select Version’ list on the left side of the utility.

8 Enter the NetVX™’s IP address in the space provided.

9 Press the “Upgrade” button
A login dialog is presented if either the NetVX™’s default username or password were changed. If this happens, enter the new login and/or password to complete

The upgrade procedure may be completed using either the Vidiem™ Element Management System, or the craft port interface. Instructions for both interfaces are included in the sections listed below.

- Section C.3, "Step II: Using Vidiem – Activate the New Firmware on the System Controller" on page 478.
- Section C.5, "Step II: Using the Craft Port – Activate the New Firmware" on page 481.

C.3 Step II: Using Vidiem – Activate the New Firmware on the System Controller

1 In the Vidiem™ Element Management System, open the target NetVX™ and read its settings. Read the system's settings by either "Device > Read" from the menubar, or by pressing the "Read Device" button in the toolbar.

2 In the navigation tree, select "Utilities + (right click) Properties > Firmware" to open the Firmware dialog.

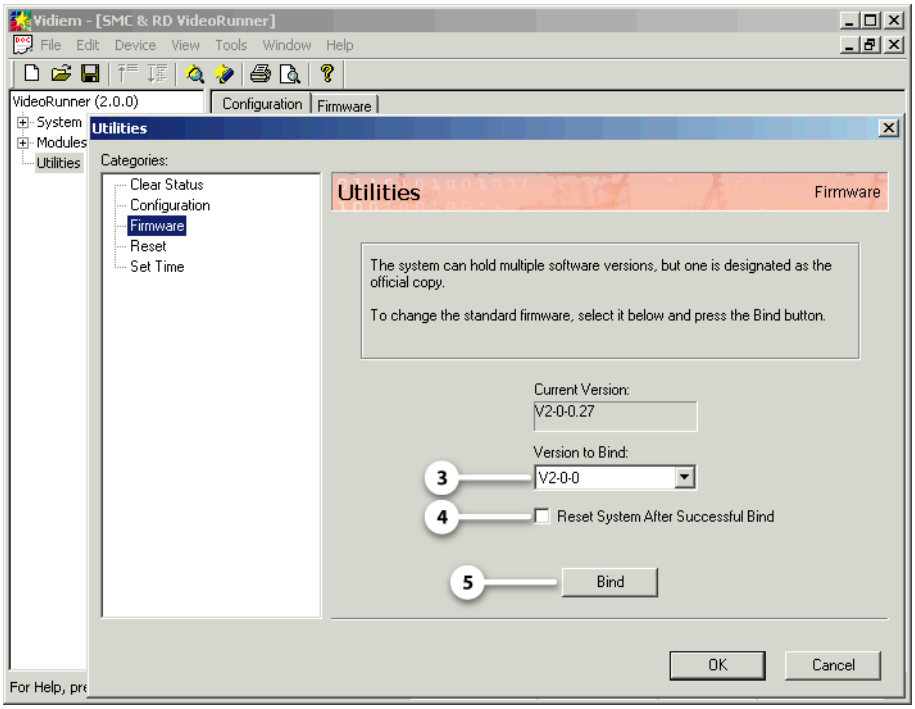

Figure C-3 Utilities Firmware Dialog

3 In the Firmware dialog, select the new firmware release in the "Version to Bind" drop down (item 3 in figure). Use the appropriate step below for your system.

3a Service-Affecting Upgrade
Systems with one or two *System Controllers...
Check the "Reset System After Successful Bind" checkbox (item 4) to cause the System Controller to reset immediately after it has bound itself to the selected version of firmware. This approach results in a one or two minute interruption in service while the system controller(s) and application modules upgrade.

3b Non-Service-Affecting Upgrade – Requires a system with two System Controllers...
DO NOT check the "Reset System After Successful Bind" checkbox.

Note: Although the firmware upgrade to the system controller(s) are non service-affecting, application modules will require a reset to load the new firmware. The application module reset will affect service unless the module has a backup.

---

4 Click the "Bind" button (item 5 in Figure C-3). NetVX™ verifies this new version of firmware and...

- In the unlikely event that the firmware failed verification, an error message is issued.
- If the "Reset System After Successful Bind" checkbox (described in Step 3a above) is checked, the system resets and begins using the new firmware to which it is bound. Use this option if you do not mind a brief interruption in service while the system and its peripheral modules reset.
- If the "Reset System After Successful Bind" checkbox is not checked, the system simply remains bound to the new firmware, **but continues using the existing, loaded, and active firmware until a manual reset or power cycle occurs**. Use this option if you intend to perform a non-service-affecting upgrade on s system with more than one system controller.

The completion of step 4 above concludes the upgrade procedure for any system with a single system controller. Follow the procedures in the next section to complete a non-service-affecting upgrade on systems with redundant system controllers.

C.4 Step III: Using Vidiem – Final Upgrade Steps for Dual-System Controller Systems

Reset the Backup System Controller

1 In the “Utilities” branch of the main navigation tree, click the “Reset” branch to open the “Reset” dialog.

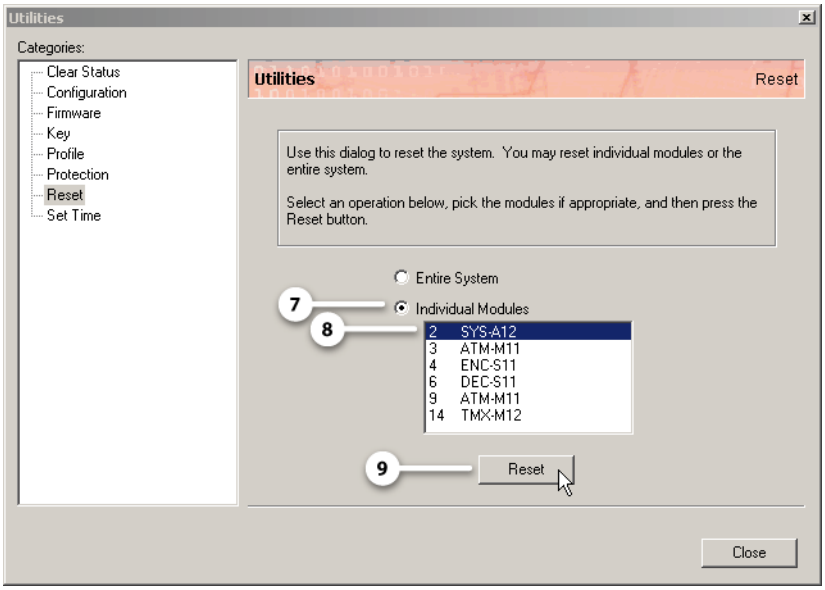

Figure C-4 Utilities Reset Dialog

2 In the “Reset” dialog, select the “Individual Modules” option (item 7 in Figure C-4)

3 Select the entry “2 SYS-A12” for the System Controller in slot 2 (item 8 in Figure C-4).

4 Press the “Reset” button (item 9 in Figure C-4) to immediately reset the secondary System Controller. After the secondary System Controller reboots, it retrieves the new firmware, which was just loaded and bound, from the Primary System Controller in slot 1.

Transfer Control to the Backup System Controller

5 Click the “Protection” branch to open the “Protection” dialog.

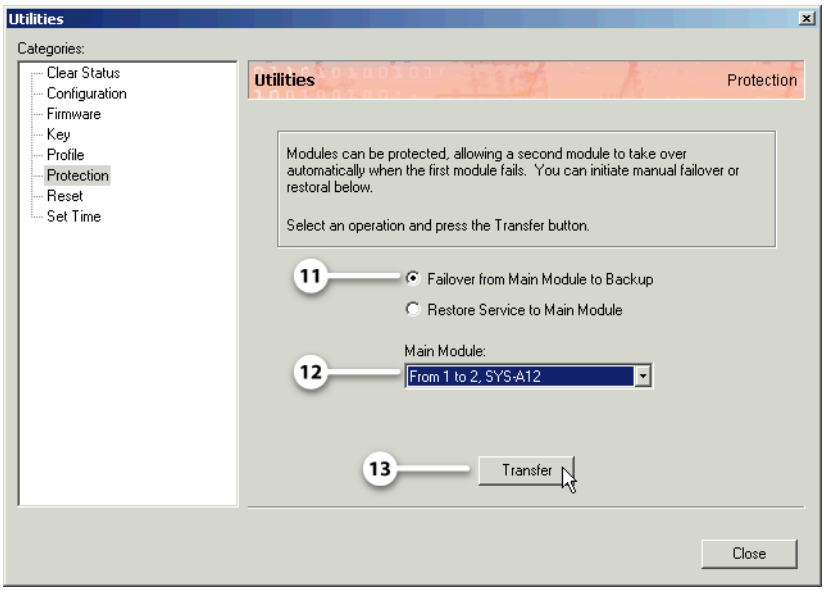

Figure C-5 Utilities Protection Dialog

6 Choose the “Failover from Main Module to Backup” option (item 11 in Figure C-5).

7 Choose “From 1 to 2 SYS-A12” (item 12 in Figure C-5).

8 Click the “Transfer” button to transfer system control from slot 1 to slot 2. The backup SYS-A12 is now in control and running the new firmware.

Reset the Main System Controller to Upgrade Its Firmware

9 Repeat steps 1 through 4 of this procedure, but in step 3, target the System Controller in slot “1 SYS-A12” for reset. The main SYS-A12 module is now running the new firmware but it is not in control of the system.

Transfer Control Back to the Main System Controller

10 Repeat steps 6 through 8, but choose the option to failover “From 2 to 1 SYS-A12” instead.

At this point the System Controller module in slot 1 should be active and running the system using the new firmware loaded at the beginning of this procedure.

Both system controllers are now running the new firmware.

Upgrade the System’s Application Modules

At this point the system’s application modules are still running the previous version of firmware.

In order to complete a wholly non service-affecting upgrade, each application module must have a backup module; if this is the case then proceed to step 11 below to complete the non service-affecting upgrade.

If backup modules are not available for all application modules, then a system reset should be performed during a system maintenance window to load the new firmware on all application modules.

11 Repeat the above steps for each type of the system’s application modules; these modules must be reset before the new firmware is loaded and operates on them.

- Reset the backup module.
- Transfer the service from the main module to the backup module.
- Reset the main module.
- Transfer the service from the backup module back to the main module.

C.5 Step II: Using the Craft Port – Activate the New Firmware

Use the following steps to bind and activate firmware using the craft port interface.

1. Specify the version of firmware the system should use.

```
util firmware #.#.#
```

2. Use the appropriate step below for your system.

2a [Service-Affecting Upgrade]
Systems with one System Controller...
Use the following command to reset the main system controller to upgrade the system to the selected version of firmware. This approach results in a one or two minute interruption in service while the system controller and application modules upgrade. This steps concludes the upgrade procedures for systems with a single system controller.

```
util reset slot.1
```

2b [Non-Service-Affecting Upgrade]
Systems with two System Controllers...
Follow the steps in the next section Section C.6, "Step III: Using the Craft Port – Final Upgrade Steps for Dual-System Controller Systems" on page 481.

C.6 Step III: Using the Craft Port – Final Upgrade Steps for Dual-System Controller Systems

1. Reset the backup system controller.

```
util reset slot.2
```

2. Wait 45–60 seconds for the backup system controller to fully reset. When the reset is completed, the backup system controller begins using the new firmware.
3. Transfer the service from the main system controller to the backup system controller.

```
util failover slot.1
```

4. Reset the main system controller.

```
util reset slot.1
```

5. Wait 45–60 seconds for the main system controller to fully reset. When the reset is completed, the main system controller is then operating using the new firmware.
6. Transfer the service from the backup system controller to the main system controller.

```
util failback slot.2
```

7. Repeat the above steps for each type of the system's application modules; these modules must be reset before the new firmware is loaded and operates on them.
   - Reset the backup module.
   - Transfer the service from the main module to the backup module.
   - Reset the main module.
   - Transfer the service from the backup module back to the main module.

Appendix D: Safe-Mode

D

D.1 Safe-Mode

The NetVX™ provides a safe mode to restore basic IP settings and begin system restoration and recovery following a catastrophic system failure.

D.2 How to Put the NetVX™ into Safe Mode

1. Connect the craft port interface.
2. Restart the system.
3. During boot, type “SM” when prompted to enter safe mode.
4. Use safe mode to restore the following Ethernet IP settings.

```
vr safe-mode> cfg sys/ip/eth ipaddr=#.#.#.#[1]
vr safe-mode> cfg sys/ip/eth ipgate=#.#.#.#
vr safe-mode> cfg sys/ip/eth ipmask=#.#.#.#
vr safe-mode> util sys reset
```

5. Use the upgrade.exe utility to load new firmware. See Chapter C "Appendix C: Firmware Upgrade Procedure" on page 475 for details.

1. Use the system’s IP addresses in place of the #.#.#.# shown in these examples.

Appendix E: Boot ROM Upgrade Procedure

E

E.1 Boot ROM Upgrade

⚠ WARNING!

Read the following points carefully before proceeding!

- Upgrading the system controller master bootrom is potentially dangerous. It is very important that power to the system controller not be interrupted while the programming operation is in progress. If something goes wrong while reprogramming the bootrom, the system controller may be unable to boot. This condition requires returning the system controller to the factory to replace the bootrom.
- You should also lock out remote access, so someone doesn't inadvertently reset the system while it is reprogramming.
- You should only upgrade the bootrom if you are trying to fix a specific problem, and you know that the new bootrom addresses that problem. Do not upgrade the Boot ROM simply to have the “latest and greatest”.

Procedure

1. If you have a redundant-controller system, you must individually upgrade each controller. First, remove the controller in slot 2. This prevents the craft-port from switching controllers during the process, which would be confusing.
2. Place the bootA12.hex file into a directory on a PC that has IP connectivity to the target system.
3. Open a DOS window and cd to the directory that has the bootA12.hex file.
4. Type “ftp xxx.xxx.xxx.xxx” (i.e., the address of the system) and login (admin admin).
5. Type “put bootA12.hex” (this transfers the file from the PC to the system).
6. Type “bye” (this exits from the ftp session).
7. From the craft port, type the command “burnboot bootA12.hex” and follow all directions. When prompted to proceed, type “yes” to continue.
8. To conserve disk space, delete the bootA12.hex file from the system by typing “rm bootA12.hex” at the craft port.
9. If you have a redundant-controller system, replace the controller in slot 2, and wait until the controller has booted and is operational. Remove the controller in slot 1, then repeat steps 3 through 8. When done, replace the controller in slot 1 and failback to slot 1.

Appendix F: Encoder Delay Settings

for External AC-3 Audio Compression

F

F.1 MPEG-2 Encoder Audio Delay Settings for External Audio Compression

Abstract: *This application note provides guidelines for using any of the NetVX™ Video Networking System's MPEG-2 encoding modules in conjunction with an external digital audio encoder such as the Dolby Model DP569.*

The NetVX™ Video Networking System's MPEG-2 encoding modules can be configured to accept externally compressed audio. When using external audio compression, the encoder's 'Audio Delay' setting must be adjusted to achieve proper lip-sync. The NetVX™ Video Networking System's MPEG-2 encoding modules provide an 'Audio Delay' setting to help achieve lip-sync. This setting can have either a positive or a negative value. A negative 'Audio Delay' value is used to synchronize audio and video when using an external audio encoder. The best negative delay value to use is the one that most closely approximates the amount of time required by the external audio encoder to perform its end-to-end processing.

F.1.1 How to Determine the Ideal 'Audio Delay' Value

Table F-1 provides guidance on the best values to use for the 'Audio Delay' setting.

Table F-1 Audio Delay Factors and Settings when Using External Audio Compression

[1] Range of Received Audio Encoding Rates	[2] "Audio Standard" Setting	[3] Dolby DP569 Encoder Delay	[4] Delay Added by The NetVX™ Encoder for IEC-61937 Compliance	[5] Recommended 'Audio Delay' Setting
Min. – 192 kbps.	extComp-192k	187 ms.	5.5 – 8.0 ms.	-195.0 ms.
192 – 256 kbps.	extcomp-256k	187 ms.	8.0 – 8.9 ms.	-195.9 ms
256 – 384 kbps.	extComp-384k	187 ms.	8.9 – 10.6 ms.	-197.6 ms.
384 – 448 kbps.	extcomp-448k	187 ms.	10.6 – 11.6 ms.	-198.6 ms.
448 – 640 kbps.	extComp-640k	187 ms.	11.6 – 14.2 ms.	-201.2 ms.
NA	extComp-2400k	NA	NA	NA

[1] Range of... Rates Use this column to locate the range containing the uncompressed audio bitrate.

[2] Audio Standard This column specifies the correct 'Audio Standard' (cfg slot.s/enc.m/aud.n standard) to specify for the given 'Range of Rates' (column 1).

[3] Dolby... Delay This column indicates the default delay introduced by the Dolby DP 569 Audio Encoder.

[4] Delay... Compliance This column indicates the delay introduced by the NetVX™ encoder in order to achieve IEC-61937 compliance.

[5] Audio Delay This column indicates the recommended 'Audio Delay' setting for each 'Range of Rates'. This "Delay" value is configured in Vidiem™ on the encoder's 'Audio Properties' dialog or at the craft port using the cfg slot.s/enc.m/aud.n delay command.

Note: (1) The values shown in Table F-1do not take into account delays that may be added by audio signal routing, or additional audio pre-processing.
(2) The values shown Table F-1 reflect the use of the Dolby 569 external audio encoder. A different external audio encoder is likely to require a different amount of time to process the audio signal.