CQM1

THE FLEXIBLE, HIGH SPEED CONTROL SOLUTION

OMRON®

Giving you every advantage.

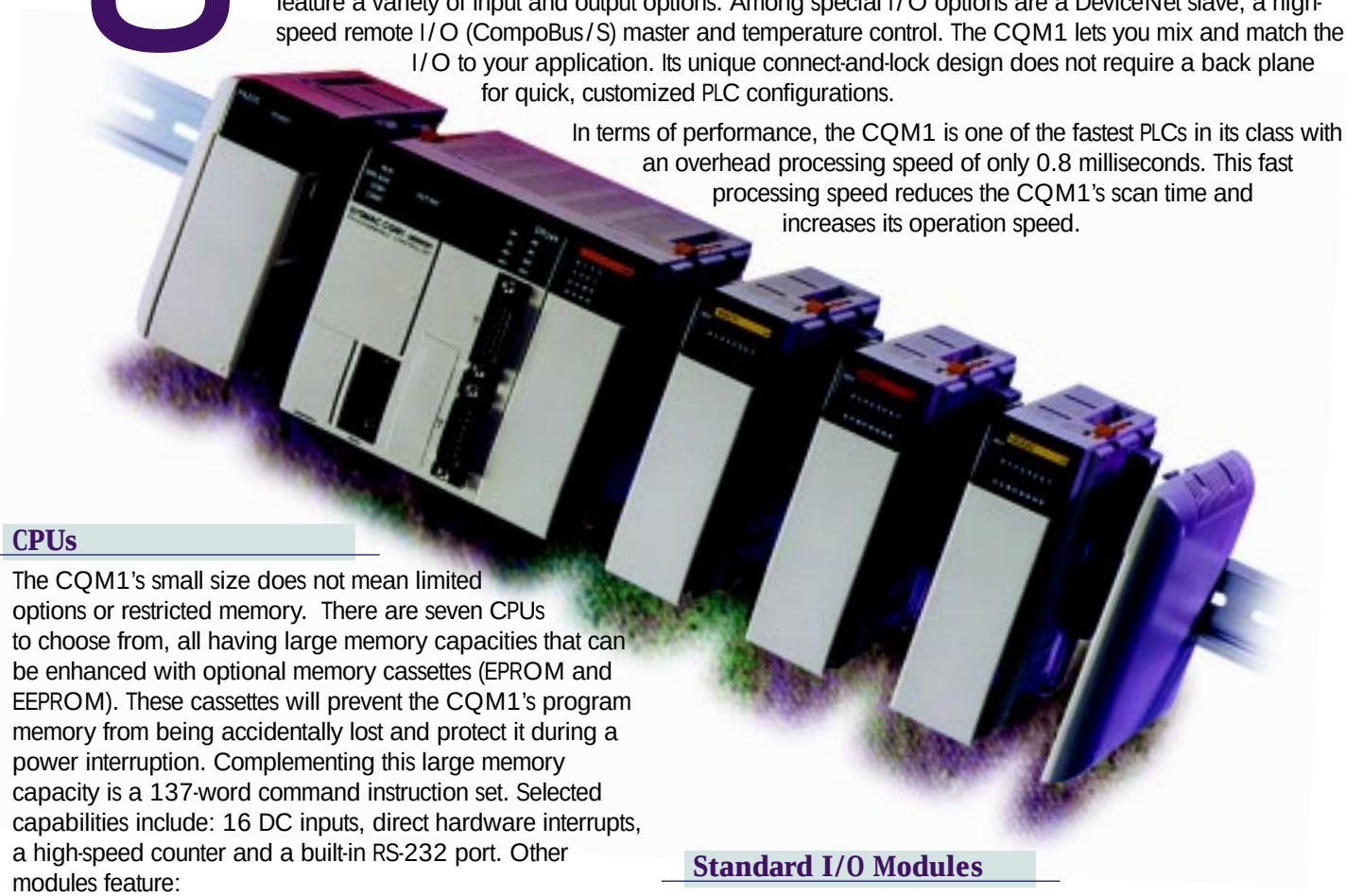
CQM1

Controlling Quality with this Exceptional Machine

Take control of your small machine applications with Omron's CQM1 PLC. It offers many hardware options, including multiple CPUs, power supplies and I/O modules with varying capabilities that make it an easy-to-customize fit for your control applications. In addition, its physical and performance features make it an attractive and practical solution for multiple small and medium sized control applications.

The versatile CQM1 offers seven CPUs with different performance levels and memory capacities. Standard features include high-speed counters and the ability to accept quadrature inputs at 2.5 kHz. Combine standard and special I/O for a customized solution to your application. Standard I/O modules feature a variety of input and output options. Among special I/O options are a DeviceNet slave, a high-speed remote I/O (CompoBus/S) master and temperature control. The CQM1 lets you mix and match the I/O to your application. Its unique connect-and-lock design does not require a back plane for quick, customized PLC configurations.

In terms of performance, the CQM1 is one of the fastest PLCs in its class with an overhead processing speed of only 0.8 milliseconds. This fast processing speed reduces the CQM1's scan time and increases its operation speed.



CPUs

The CQM1's small size does not mean limited options or restricted memory. There are seven CPUs to choose from, all having large memory capacities that can be enhanced with optional memory cassettes (EPROM and EEPROM). These cassettes will prevent the CQM1's program memory from being accidentally lost and protect it during a power interruption. Complementing this large memory capacity is a 137-word command instruction set. Selected capabilities include: 16 DC inputs, direct hardware interrupts, a high-speed counter and a built-in RS-232 port. Other modules feature:

- Built-in analog timers
- 2 axis position control capabilities
- Built-in analog I/O
- Dual high speed (50 KHz) encoder interfaces or dual absolute encoder interfaces

Special I/O Modules

Address your particular needs with a combination of our special I/O modules. In addition to our B7A interface module that reduces I/O wiring, our remote I/O link module for distributed control applications and our high-speed CompoBus/S communications I/O, you have a choice of other modules that include:

- Four-point analog input
- Two-point analog input
- DeviceNet
- Dual loop temperature control
- Direct sensor input

Standard I/O Modules

The input modules include AC or DC models with capacities ranging from eight to 32 points. The output models also have capacities ranging from eight to 32 points and the following outputs:

- Triac
- Transistor
- Relay

Power Supply Modules

Power your CQM1 with one of three power supply units: two AC modules – one with and one without a service power supply and DC module.

Standard Models

Customize the CQM1 to your application by using the wide selection of units.

Power Supply Units

There are three available power supply units – one using 24 VDC and the rest using 100 to 240 VAC. The AC units come with or without a built-in 24 VDC service power supply.

Supply Voltage	24 VDC Service Power Supply	Supplied to Units (5V)	Model
100 to 240 VAC 50/60 Hz	None	3.6 A, 18 W	CQM1-PA203
	0.5 A	6.0 A, 30 W (includes service supply)	CQM1-PA206
24 VDC	—	6.0 A, 30 W	CQM1-PD026

CPU Units

The CQM1 CPU units have 16 built-in DC inputs. Four of these inputs can be used as interrupt inputs and one can be used as a high-speed counter input.

Max. I/O Points	Program Capacity	DM Capacity	RS-232C Port	Analog Setting	Pulse I/O	ABS Interface	Built-in Analog I/O	Current Consumption	Model
128	3.2K words	1K words	—	—	—	—	—	800 mA, 5 VDC	CQM1-CPU11-E
			Yes	—	—	—	—	820 mA, 5 VDC	CQM1-CPU21-E
256	7.2K words	6K words	Yes	—	—	—	—		CQM1-CPU41-EV1
				Yes	—	—	—	820 mA, 5 VDC	CQM1-CPU42-EV1
				—	Yes	—	—	980 mA, 5 VDC	CQM1-CPU43-EV1
				—	—	Yes	—		CQM1-CPU44-EV1
				—	—	—	Yes		CQM1-CPU45-EV1

Note: The End Plate that covers the right side of the CQM1 is included with the CPU unit.

Memory Cassettes (optional)

Choose either the EEPROM or the EPROM Memory Cassette to enhance the CQM1's memory. They will prevent the CQM1's Program Memory and DM from being lost during power interruption. The program and data in DM can be transferred between the CPU unit's RAM and the Memory Cassette. Data cannot be written to EPROM from the CPU unit.

Memory	Capacity	Clock	Model
EEPROM	4K words	—	CQM1-ME04K
		Yes	CQM1-ME04R
	8K words	—	CQM1-ME08K
		Yes	CQM1-ME08R
EPROM (IC socket only)	—	—	CQM1-MP08K
		Yes	CQM1-MP04R

Clock Function

Clock and calendar data can be used in the program when a Memory Cassette with the clock function is installed.

Input Modules

Inputs	Input Points	Input Voltage	Configuration	Model
DC	8	12 to 24 VDC	Independent contacts	CQM1-ID211
	16	12 VDC	16 points/ common	CQM1-ID111
		24 VDC		CQM1-ID212
	32	12 VDC	32 points/ common	CQM1-ID112
		24 VDC		CQM1-ID213
AC	8	100 to 240 VAC	8 points/ common	CQM1-IA121
		200 to 240 VAC		CQM1-IA221

Output Modules

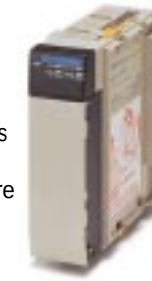
Outputs	Output Points	Max. Switching Voltage	Configuration	Model
Contact	8	250 VAC/ 24 VDC	Independent contacts	CQM1-OC221
	16		16 pts/ common	CQM1-OC222
	8		Independent	CQM1-OC224
Transistor	8	24 VDC 24 VDC PNP	8pts/common	CQM1-OD211
	16		16pts/common	CQM1-OD212
	32		32pts/common	CQM1-OD213
	16		16pts/common	CQM1-OD214
	8		8pts/common	CQM1-OD215
AC	8	100 to 240 VAC	4pts/common 2 circuits	CQM1-OA221
	6		4pts/common 2pts/common	CQM1-OA222

Special I/O Modules

CQM1-SRM21 (CompoBus/S) Master Module
Module acts as the Master of a high-speed ON/OFF remote I/O unit, controlling a maximum of 128 I/O points.

CQM1-DA021 Analog Output Module
This module allows two-point digital-to-analog conversion. Requires CQM1-IPS01/02 power supply unit.

CQM1-TC00□/10□ Temperature Control Module
Module provides two temperature control loops and is ideal for simple ON and OFF temperature control.



CQM1-DRT21 DeviceNet Slave
DeviceNet Slave constructs an I/O link of 32 I/O points with the DeviceNet Master.

CQM1-IPS01/02 Power Supply Module
Required power supply for analog input and output modules.

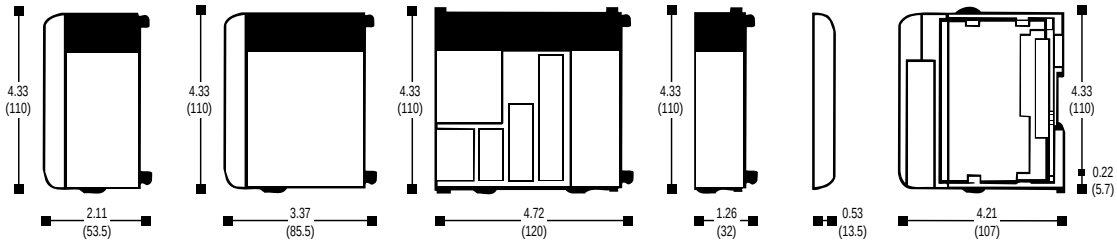
CQM1-LSE0□ Linear Sensor Interface Module
The module converts voltage or current inputs from linear sensors to numeric data for comparative decision processing.

CQM1-AD041 Analog Input Module
Use this module to input 4 analog voltage or current signals into the CQM1. Requires CQM1-IPS01/02 power supply module.

CQM1-B7A□□ B7A Interface Module
Allows direct link to Omron's B7A Remote I/O series via twisted-pair wire.

CQM1-SEN01 Sensor Module
Space saving module reduces wiring and allows direct connection of selected sensors to the CQM1.

Dimensions: Inches (Millimeters)



General Specifications (Power Supply Unit)

ITEM	CQM1-PA203	CQM1-PA206	CQM1-PD026
Supply Voltage	100 to 240 VAC at 50/60 Hz	100 to 240 VAC at 50/60 Hz	24 VDC
Operating Voltage Range	85 to 264 VAC	85 to 264 VAC	20 to 28 VDC
Power Consumption	60 VA max.	120 VA max.	50 W max.
Output Capacity	5 VDC @ 3.6 A (18 W)	5 VDC @ 6 A (30 W)	5 VDC @ 6 A (30 W)
24 VDC (Service power supply)	——	24 VDC @ 0.5 A	——
Ambient Operating Temperature	0° to 55° C	0° to 55° C	0° to 55° C
Ambient Operating Humidity	10% to 90%	10% to 90%	10% to 90%

Performance Specifications (CPU)

ITEM	CQM1-CPU11, CPU21	CQM1-CPU41-EV1, CPU42-EV1,CPU43-EV1, CPU44-EV1, CPU45-EV1
CONTROL METHOD	Stored program method	Stored program method
I/O CONTROL METHOD	Cyclic scan with direct output; immediate interrupt processing	Cyclic scan with direct output; immediate interrupt processing
PROGRAMMING LANGUAGE	Ladder diagram	Ladder diagram
INSTRUCTION LENGTH	1 step per instruction, 1 to 4 words per instruction	1 step per instruction, 1 to 4 words per instruction
NUMBER OF INSTRUCTIONS	117 instructions	137 instructions
INSTRUCTION EXECUTION TIME	Basic instructions: 0.5 µs to 1.5 µs (e.g., LD=0.5 µs, TIM=1.5 µs) Special instructions: (e.g., MOV (21)=23.5 µs)	Basic instructions: 0.5 µs to 1.5 µs (e.g., LD=0.5 µs, TIM=1.5 µs) Special instructions: (e.g., MOV (21)=23.5 µs)
PROGRAM CAPACITY	Program memory: 3.2K words	Program memory: 7.2K words
MAX. NUMBER OF I/O MODULES	7 modules	11 modules
DATA AREAS		
I/O Points	128 points max.	256 points max.
Work Area (IR)	2,720 bits	2,720 bits
SR Area (SR)	192 bits	192 bits
Temporary Memory Area (TR)	8 bits (TR0 to TR7)	8 bits (TR0 to TR7)
Holding Area (HR)	1,600 bits (HR00 to HR99)	1,600 bits (HR00 to HR99)
Auxiliary Area (AR)	448 bits (AR00 to AR27)	448 bits (AR00 to AR27)
Link Area (LR)	1,024 bits (LR00 to LR63)	1,024 bits (LR00 to LR63)
Timer/Counter Area (TIM/CNT)	512 timers/counters; high-speed timer: 16 (0.01 s increments)	512 timers/counters; high-speed timer: 16 (0.01 s increments)
Data Memory (DM)	1K words	6K words
BUILT-IN FEATURES		
Interrupt Processing	Hardware interrupts: 4 points; Scheduled interrupts: 3 points with minimum setting 0.5 mS	Hardware interrupts: 4 points; Scheduled interrupts: 3 points with minimum setting 0.5 mS
High-Speed Counter	2 phases: 2.5 kHz x 1 point; additional phases: 5 kHz x 1 point	2 phases: 2.5 kHz x 1 point; additional phases: 5 kHz x 1 point
Pulse Output	1 kHz x 1 point	1 kHz x 1 point

Ordering Information

PRODUCT NAME	MAIN SPECIFICATION	MODEL
POWER SUPPLY	100 to 240 VAC at 50/60 Hz	CQM1-PA203
	100 to 240 VAC at 50/60 Hz, with service power supply: 0.5 A at 24 VDC	CQM1-PA206
	24 VDC	CQM1-PD026

CPU User memory	Data memory	RS-232C	BUILT-IN FEATURES: Analog Timer	Pulse I/O	ABS I/F	Analog I/O	
3.2K words	1K words	—	—	—	—	—	CQM1-CPU11-EVI
		•	—	—	—	—	CQM1-CPU21-EVI
7.2K words	6K words	•	—	—	—	—	CQM1-CPU41-EVI
		•	•	—	—	—	CQM1-CPU42-EVI
		•	—	•	—	—	CQM1-CPU43-EVI
		•	—	—	•	—	CQM1-CPU44-EVI
		•	—	—	—	•	CQM1-CPU45-EVI

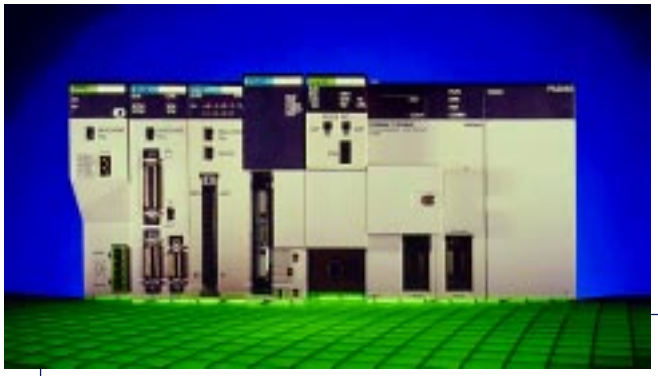
INPUT MODULES		
DC Input	8 points, 12 to 24 VDC	CQM1-ID211
	16 points, 24 VDC	CQM1-ID212
	32 points, 24 VDC	CQM1-ID213
AC Input	8 points, 100 to 120 VAC	CQM1-IA121
	8 points, 200 to 240 VAC	CQM1-IA221
OUTPUT MODULES		
Relay Outputs	8 points, 2 A at 24 VDC or 250 VAC (16 A per Unit) independent commons	CQM1-OC221
	16 points, 2 A at 24 VDC or 250 VAC (8 A per Unit)	CQM1-OC222
Transistor Outputs	8 points, 2 A at 24 VDC (5 A per Unit)	CQM1-OD211
	16 points, 50 mA at 4.5 VDC to 300 mA at 26.4 VDC	CQM1-OD212
	32 points, 100 mA at 24 VDC	CQM1-OD213
	16 points, 50 mA at 4.5 VDC to 300 mA at 26.4 VDC, PNP outputs	CQM1-OD214
	8 points, 1.0 A at 24 VDC (4 A per Unit), PNP outputs with short-circuit protection, alarm output	CQM1-OD215
Triac Outputs	8 points, 0.4 A at 100 to 240 VAC	CQM1-OA221
	6 points, 0.4 A at 100 to 240 VAC	CQM1-OA222
SPECIAL I/O MODULES		
Analog Input	Analog inputs: 4 points 4 to 20 mA/–10 to 10 V/1 to 5 V/0 to 10 V	CQM1-AD041
Analog Output	Analog outputs: 2 points, 0 to 20 mA/–10 to 10 V	CQM1-DA021
Power Supply Module	The analog input and output modules require a power supply, available in two modules. Note: Two CQM1-DA021 cannot be used with CQM1-IPS02. — For one module	CQM1-IPS01
	For two modules	CQM1-IPS02
Temperature Control Module*	Two temperature controllers in a single-slot module	CQM1-TC000
Sensor Module*	Up to four amplifier units mount directly to a single slot	CQM1-SEN01
CompoBus Module	CompoBus/S master module	CQM1-SRM1
	DeviceNet I/O link terminal	CQM1-DRT21
B7A Interface Module	16 inputs and 16 outputs	CQM1-B7A01
	16 outputs	CQM1-B7A02
	32 outputs	CQM1-B7A03
I/O Link Module	Used as a Slave Unit in a Sysmac BUS Wired Remote I/O System. 2 input words (32 bits), 2 output words (32 bits).	CQM1-LK501
MEMORY CASSETTE (OPTIONAL)	EEPROM, 4K words	CQM1-ME04K
	EEPROM, 4K words, with real-time clock built-in	CQM1-ME04R
	EEPROM, 8K words	CQM1-ME08K
	EEPROM, 8K words, with real-time clock built-in	CQM1-ME08R
	EPROM, IC socket only	CQM1-MP08K
	EPROM, IC socket only, with real-time clock built-in	CQM1-MP08R
PROGRAMMING CONSOLE	Provided with a 1.5 m connection cable (compatible with C-series PLCs)	CQM1-PRO01-E or C200H-PRO27-E
PROGRAMMING SOFTWARE	SYS-WIN (Windows based)	SYSWIN-HL-V3.2A
	Connecting Cable (Peripheral Port to Computer)	CQM1-C1F02
	Connecting Cables (RS232 to Computer 9 pin),	C200HS-CN220-EU
	(RS232 to Computer 25 pin)	C200HS-CN229-EU

** For more details, please contact Omron and refer to catalog number.*

Omron Control Solutions

The revolutionary SRM1 micro network controller combines the compact power of block style micro PLCs with the remote I/O flexibility of larger PLC systems and an innovative design that reduces wiring. Its superior performance is based on a 4K word-program capacity, extensive 137-word command instruction set, an instruction execution speed of 0.8 microseconds or faster, and a constant 750 kbps baud rate for superior operating speeds. Use the SRM1 to control up to 256 I/O points and place them directly where you want them.

The CPM1A family of micro-programmable controllers is the best way to maximize dollars and space while meeting your control needs for small-scale control systems. These versatile units feature new transistor output CPUs that have a pulse output capability to control a stepper motor, a built-in 5kHz high speed counter and a peripheral port that can be converted to an RS-232 port for easy communications. The CPM1As can be expanded to 100 I/O and feature the new MAD-01 (Mixed Analog Digital I/O) used integrate analog signals into your control systems.



Get the advantages of large PLC performance and I/O versatility with the C200H Alpha. Choose from 13 CPU models that can support more than 1,000 I/O, including 16 special I/O modules per CPU for customized control. Use the built-in Protocol Macro function to support most common serial devices or customize one of your own for RS-232C, RS-422 and RS-485 communications. The C200H Alpha smoothly fits into either DeviceNet or Ethernet networks.

OMRON®

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