PRODUCT OVERVIEW

CQM1H Programmable Controller

Features

The CQM1H series programmable controller offers advanced flexibility, powerful communication options, and has features traditionally found only in full rack PLC systems. The CQM1H's rack-less modular design allows the user to customize the control system to their own system requirements. Advanced inner-boards, specialized I/O, and communication modules allow flexibility that no other PLC system in this class can offer.



- **4 different base CPUs to choose from with up to 512 points of I/O**
- **Modular design requires no back plane**
- **Inner Boards allow a "customized" configuration of CPU**
- **Serial Communications inner-board supports protocol macros allowing communication with 3rd party devices**
- **Supports all existing and new CQM1 I/O and specialized I/O modules**
- **Optional memory cassettes allow backup of sensitive data and provides real time clock**
- **ControllerLink Module transmits data along Controller Link network at up to 2Mbps (8K word packets) for up to 32 nodes**
- **Advanced instruction set includes PID, Floating point math, Protocol macro instructions and more**
- **Compobus/S and AS-interface master modules support remote I/O**
- **Supported by CX-Programmer V1.2**
- **Up to 15.2 K words of program memory**
- **16 DC inputs built into CPU**
- **UL/CSA/CE**

System Configuration

ControllerLink module allows connection of a CQM1H to a ControllerLink network. Large amounts of data can be transferred easily and flexibly with personal computers as well with other Omron PLCs that support Controller Link.

Inner boards (CPU51 and CPU61 only) allow custom configuration of CPU. Options such as Analog I/O, Pulse I/O, Absolute encoder interface, Serial communications, and Analog setting boards give the user complete control flexibility.

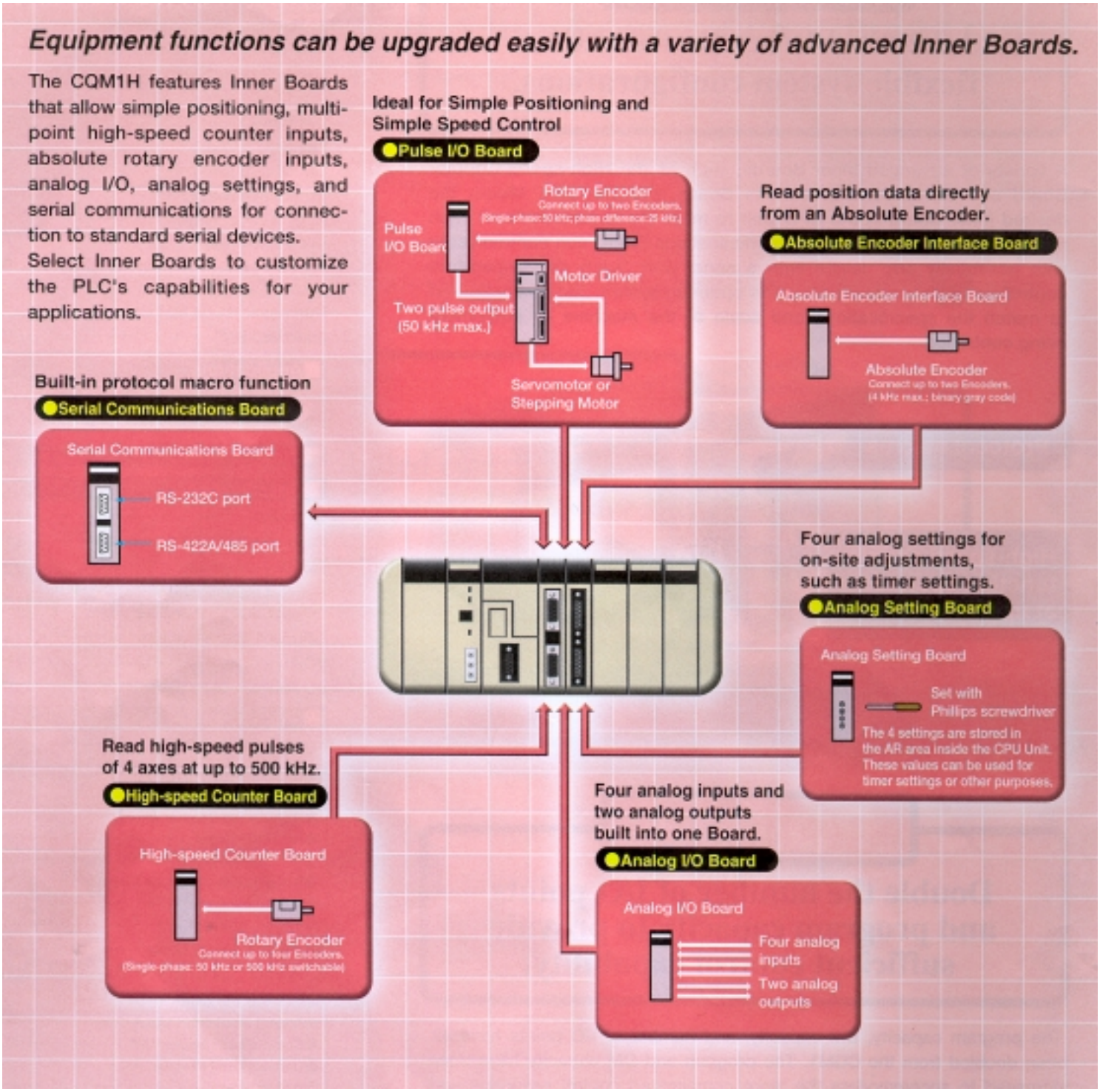


Power supply options are available in 18W or 30W output with input ranges of 100 to 40VAC

4 different base CPUs to choose from. Built in serial port and 16 DC inputs standard on most models

Customize I/O with 8,16, or 32 point I/O modules. Dedicated I/O modules provide analog control, temperature sensor control, and interfacing capability.

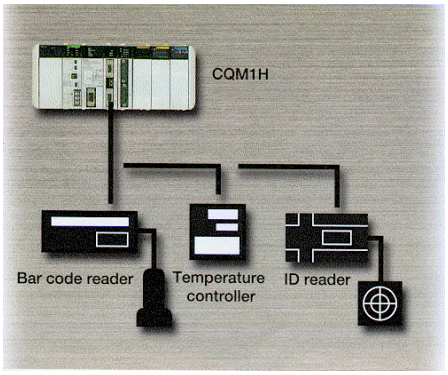
Inner Boards



Communication

Serial and Peripheral Communication

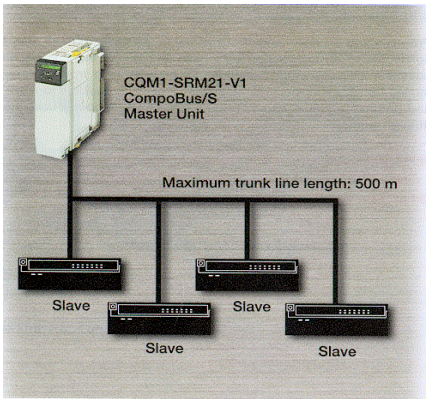
- Built in RS232C and peripheral port (excludes CPU11)
- Connect directly to Omron programming devices and operator interface terminals
- 1:1 connection to other Omron PLCs allows CPUs to seamlessly share data
- Protocol macro function allows user to create macros for protocols to match communication specifications of an external device allowing data transfers between CPU and devices to be executed with a single PMCR instruction
- Serial communication inner-board supports RS232C, RS422/485, and protocol macro function



Protocol macro function supported by Serial Communications inner-board

Device Level Communication

- Compobus/S master unit enables long distance remote I/O connection with Compobus/S slaves
- DeviceNet slave enables the CQM1H to act as a slave on a DeviceNet network
- AS-Interface master module enables remote I/O connection with ASi slaves



Compobus/S Master allows connection to remote slaves via Compobus/S network

ControllerLink Module

- ControllerLink module can be connected to CQM1H allowing connection to a controller link network via twisted pair wiring
- Data can be exchanged efficiently between PLCs in the network using data links and message communications
- Data and messaging can be transferred between personal computers, CS1, C200H Alpha, CVM1, and CV series controllers
- High speed connection at up to 2 Mbps link
- High capacity data link of up to 32K words per network and 8K words per node
- Connect up to 32 nodes per network
- Supports FINS protocol on ControllerLink as a node in a multi-layer network architecture


ControllerLink Module allows large amounts of high speed data to be exchanged between multiple Omron PLCs or a personal computer via the ControllerLink Network

I/O

Input Modules



- 8, 16, or 32 point modules
- AC or DC inputs
- Independent or shared commons
- Screw terminal or I/O connector versions

Output Modules



- 8, 16, or 32 point modules
- Relay contact, transistor, or triac outputs
- Independent or shared commons
- Screw terminal or I/O connector versions

Specialized I/O

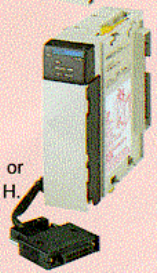
CQM1-SRM21-V1
CompoBus/S Master Unit
A high-speed ON/OFF Remote I/O Master Unit that controls up to 128 I/O points. Also supports a long-distance communications mode.



CQM1-DRT21
CompoBus/D I/O Link Unit
Operates as a DeviceNet slave to establish an I/O link of 32 I/O points with a CompoBus/D Master.



CQM1-AD041
Analog Input Unit
Receives 4 analog voltage or current inputs into the CQM1H.



CQM1-DA021
Analog Output Unit
Performs digital-to-analog conversion for two outputs.



CQM1-IPS01/02
Analog Power Supply Units
Required to supply power when using an Analog Input Unit or Analog Output Unit.



CQM1-B7A□□
B7A Interface Units
Five Units are available that can connect with B7A Link Terminals.



CQM1-SEN01
Sensor Unit
Three models of Sensor Modules can be mounted to the Sensor Unit and optical fiber sensors can be connected directly to the CQM1H.



CQM1-TC00□ and CQM1-TC10□
Temperature Control Units
One Unit can receive data from two temperature control devices and is ideal for ON/OFF control.



CQM1-LSE01/02
Linear Sensor Interface Units
Make high-speed and high-precision measurements of voltage or current inputs from linear sensors and convert the measurements to numeric data for comparative decision processing.



For ordering information and other models, see Ordering Guide section at the rear of this document

SPECIFICATIONS

Item		Specification
Power Supply Capacity	CQM1-PA203 CQM1-PA206 CQM1-PD206	Supply Voltage: 100-240VAC Aux. Output: N/A Capacity: 18W Supply Voltage: 100-240VAC Aux. Output: 5, 24VDC Capacity: 30W Supply Voltage: 24VDC Aux. Output: 5 VDC (30W)
Control method		Stored program method
I.O control method		Cyclic scan with direct output; Immediate refresh processing
Programming language		Ladder diagram
Program Capacity		CQM1H-CPU11/21: 3.2K words CQM1H-CPU51: 7.2K words CQM1H-CPU61: 15.2K words
Data Memory Capacity		CQM1H-CPU11/21: 3K words CQM1H-CPU51: 6K words CQM1H-CPU61: 12K words (DM: 6K words; EM 6K words
Instruction length		1 step per instruction, 1 to 4 words per instruction
Types of instructions		Basic instructions: 14 Special instructions: 148
Execution time		Basic instructions: .375 to 1.125 µsec Special instructions: 17.7 µsec
Mounting Structure		No Backplane (Units are joined horizontally using connectors)
Mounting		Din Track mounting
Maximum number of modules		11 I/O and Special I/O (12 with CLK module)
Inner board support		CQM1H-CPU11/21: Not supported CQM1H-CPU51/61: 2 Boards maximum (See CQM1H manual for configuration details)
Controller Link Unit Support		CQM1H-CPU11/21: None CQM1H-CPU51/61: 1 unit
Certification		UL/CSA/CE

Dimensions

	PA203	PA206/PD026	CPU11/21/51/61	Modules (all)
Width	53.5 mm (2.11 in)	85.5 mm (3.36 in)	120 mm (4.72 in)	32 mm (1.26 in)
Depth	107 mm (4.21 in)	107 mm (4.21 in)	107 mm (4.21 in)	107 mm (4.21 in)
Height	110 mm (4.33 in)	110 mm (4.33 in)	110 mm (4.33 in)	110 mm (4.33 in)

Calculating Overall PLC width with “n” I/O modules

Power Supply	W (mm)
CQM1-PA203	(32 x n) + 187
CQM1-PA206	(32 x n) + 219
CQM1-PD026	

Note: The total number of I/O modules and specialized modules (n) is limited to 11 Units (12 including the ControllerLink module)

Power Supplies

Description	Rated Voltage	Output Capacity	Auxiliary Supply	Part Number
AC Power Supply	100 to 240VAC	18W	N/A	CQM1-PA203
		30W	24VDC; .5A	CQM1-PA206
DC Power Supply	24VDC	30W	N/A	CQM1-PD026

CPUs

Memory Capacity	I/O Capacity	Built In Inputs	Built In RS232C port	Supports Inner Boards	Supports Controller Link	Part Number
Program: 3.2K words DM area: 3K words	256 points	16 DC Inputs	No	No	No	CQM1H-CPU11
			Yes			CQM1H-CPU21
Program: 7.2K words DM area: 6K words	512 Points			Yes	Yes	CQM1H-CPU51
Program: 15.2K words DM area: 6K words EM area: 6K words						CQM1H-CPU61

Inner Boards

Item	Description	Part Number
High-speed counter board	4 pulse inputs (high speed counter) at 500kHz max 4 external outputs	CQM1H-CTB41
Pulse I/O board	2 Pulse inputs, Single phase 50Khz, Differential phase: 25kHz	CQM1H-PLB21
Absolute encoder Interface board	2 absolute encoder (gray code binary) inputs (4kHz)	CQM1H-ABB21
Analog setting board	4 analog settings	CQM1H-AVB41
Analog I/O board	4 analog inputs: 0 to 5v, 0 to20mA, -10 to +10V 2 analog outputs: 0 to 20mA, -10 to +10V	CQM1H-MAB42
Serial communications board	One RS-232C port and one RS-422A/485 port	CQM1H-SCB41

Communications Modules

Item	Description	Part Number
ControllerLink Module	Data Link (Maximum number of words per node: 8K) Message communications (SEND/RECV/CMND instructions)	CQM1H-CLK21

Memory Cassettes

Memory	Memory Capacity	Clock Function	Part Number
Flash memory	16K words	No	CQM1H-ME16K
		Yes	CQM1H-ME16R
EEPROM	8K words	No	CQM1-ME08K
		Yes	CQM1-ME08R
	4K words	No	CQM1-ME04K
		Yes	CQM1-ME04R
EPROM memory cassette (Memory chip not included)	Cassette with IC socket Only (EPROM chip sold separately)	No	CQM1-MP08K
		Yes	CQM1-MP08R
EPROM Chip	128 KB (8K words)	N/A	ROM-ID-B
	256 KB (16K words)	N/A	ROM-JD-B
	512 KB (32K words)	N/A	ROM-KD-B

Input Modules

Input Type	Number of inputs	Input Voltage	Input Current	Common Type	Connector Type	Part Number
DC	8	12 to 24Vdc	10mA	Independent	Terminal Block	CQM1-ID212
	16	12Vdc	6mA	Shared		CQM1-ID111
		24Vdc				CQM1-ID212
	32	12Vdc	4mA		Connector	CQM1-ID112
		24Vdc	4mA			CQM1-ID213
		24Vdc	6mA			CQM1-ID214
AC	8	100 to 120VAC	5mA		Terminal Block	CQM1-IA121
		200 to 240VAC	6mA			CQM1-IA221

Output Modules

Output Type	Number of outputs	Max Switching Voltage	Max Switching Current	Common Type	Connector Type	Part Number
Contact	8	250VAC 24VDC	2 Amps	Independent	Terminal Block	CQM1-OC221
	16			Shared		CQM1-OC222
	16			Independent		CQM1-OC224
Transistor	8	24VDC	2 Amps (NPN)	Shared (Fused)		CQM1-OD211
	16		.3 Amps (NPN)			CQM1-OD212
	32		.1 Amps (NPN)		Connector	CQM1-OD213
	8		1 Amp (PNP)		Terminal Block	CQM1-OD215
	16		.3 Amps (PNP)			CQM1-OD214
	32		.5 Amps (PNP)		Connector	CQM1-OD216
Triac	8	240VAC	.4 Amps	Shared (Short circuit protected)	Terminal Block	CQM1-OA221
	6					CQM1-OA222

Specialized I/O Modules

Item	Description		Part Number
CompoBus/S Master	Controls up to 128 remote I/O points via twisted pair		CQM1-SRT21-V1
CompoBus/D I/O Link	Operates as a DeviceNet slave		CQM1-DRT21
AS-interface	Operates as a ASi master unit		CQM1-ARM21
Analog Input unit	4 Analog voltage or current inputs		CQM1-AD041
Analog Output	2 Analog voltage or current outputs		CQM1-DA021
Analog Power Supply	Power Supply for Analog modules	One Analog unit supply	CQM1-IPS01
		Two Analog unit supply	CQM1-IPS02
B7A Interface Unit	Connects to B7A link terminals	16 outputs	CQM1-B7A02
		16 inputs	CQM1-B7A12
		32 outputs	CQM1-B7A03
		32 inputs	CQM1-B7A13
		16 inputs/16 outputs	CQM1-B7A21
Sensor unit	Connect up to 4 sensor modules to a single unit		CQM1-SEN01
	Fiber Photoelectric Module	For E32 Series fiber units	E3X-MA11
	Photoelectric Module w/amplifier	For E3C series photoelectric sensors	E3C-MA11
	Proximity module w/amplifier	For E2C series proximity sensors	E2C-MA11
	Dummy module	Spacers for empty modules	E39-MA11
	Remote console	Provides sensitivity adjustment	CQM1-TU001
Temperature control Units	Thermocouple input, transistor (NPN) output, 2 loops		CQM1-TC001
	Thermocouple input, transistor (PNP) output, 2 loops		CQM1-TC002
	Platinum resistance thermometer, transistor (NPN) output, 2 loops		CQM1-TC101
	Platinum resistance thermometer, transistor (PNP) output, 2loops		CQM1-TC102
Linear sensor interface	Standard		CQM1-LSE01
	With monitor output		CQM1-LSE02

Ordering Guide Accessories

Programming Consoles

Item	Description	Part Number
Programming console	2-m connecting cable included (Compatible with C-series PLCS)	CQM1-PRO01-E
Programming console	Requires a separate connecting cable, see below	C200H-PRO27-E
Connecting cable	Cable length: 2m	C200H-CN222
Peripheral port conversion cable	Connects the peripheral port on the CQM1H to a personal computer or Programming console through a CQM1-CIF-CIF01/02 cable	CS1W-CN114

Programming Device Connecting Cables

Item	Description	Part Number
Conversion cable	Converts CQM1H peripheral port to CQM1-CIF01/02 adapter or Programming console	CS1W-CN114
Program download cable	Connects peripheral port to RS232C computer port (Use with CS1W-CN114)	CQM1-CIF02
Connecting cable	Connects peripheral port to D-sub 9pin connector. Must be used with CS1W-CN114 (3.3m)	CQM1-CIF02
Connecting cable	Directly connects Peripheral port to D-sub 9 pin connector (2 m) (No CIF required)	CS1W-CN226
Connecting cable	Directly connects Peripheral port to D-sub 9 pin connector (6 m) (No CIF required)	CS1W-CN626

Peripheral devices

Item	Description	Part Number
Programming console	Handheld programming console with 2m cable attached	CQM1-PRO01-E
Programming console	Handheld programming console with back light (Cable not included)	C200H-PRO27-E
Connecting cable	Connects C200H programming console to peripheral port (2m)	C200H-CN222
Connecting cable	Connects C200H programming console to peripheral port (4m)	C200H-CN422
Conversion cable	Converts CQM1H peripheral port to CQM1-CIF01/02 adapter or Programming console	CS1W-CN114

Software

Item	Description	Part Number
SYSWIN	SYSWIN V3.4 CD ROM	SYSWIN-V3.4
CX Programmer	CX Programmer V1.2	WS02-CXPC1-EV1.2

*CX-programmer, V1.2 available spring 2000, will support New CQM1H functions

Literature

Item	Description	Part Number
Operation Manual	CQM1H CPU and Inner board operation manual	W363-E1-1
Operation Manual	CQM1H Serial Communications Board operation manual	W365-E1-1
Programming Manual	CQM1H programming manual	W364-E1-1