Shinko
Measurement and Control Solutions Company

Modular Controllers

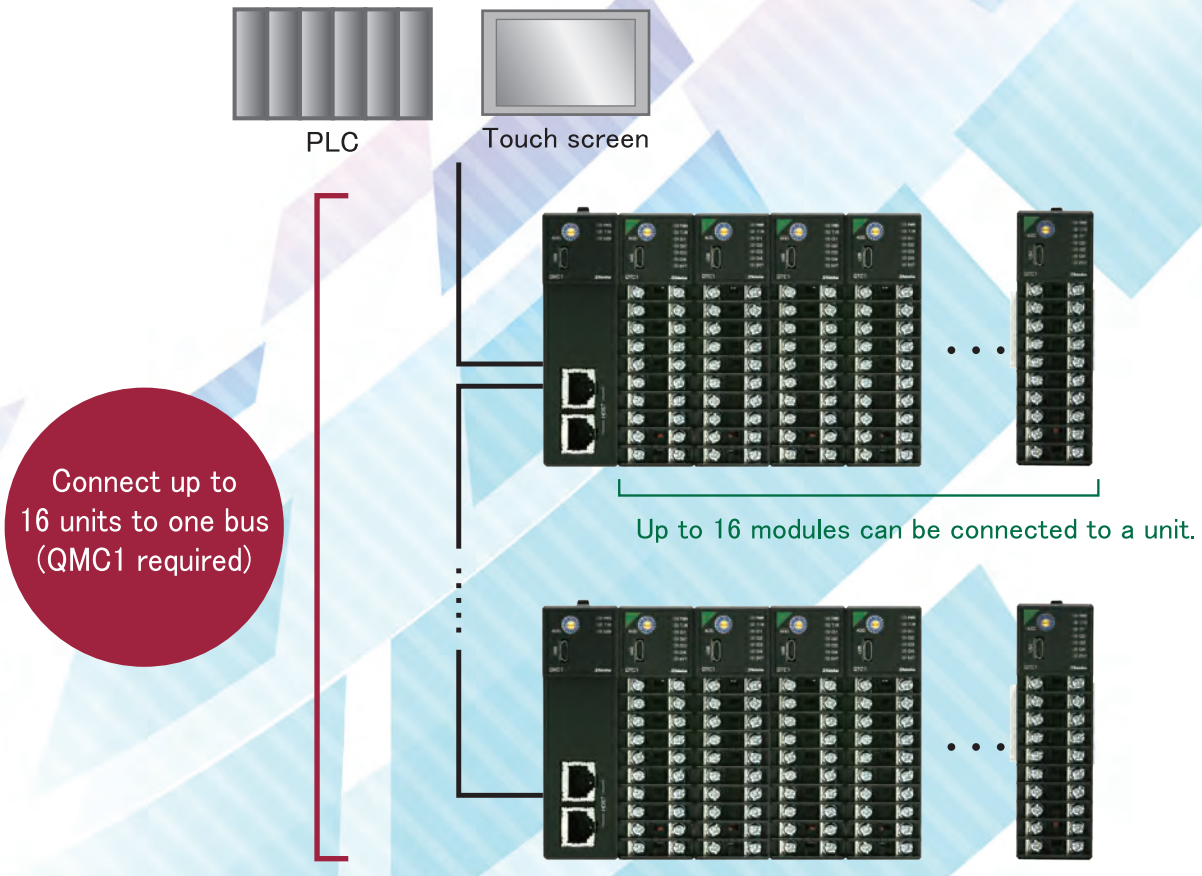
QX1 series

Expands your possibilities for measuring, controlling, and monitoring multiple points

QX1 series

Multi-point controller for infinite possibilities

Max. 1024-point measurement and control



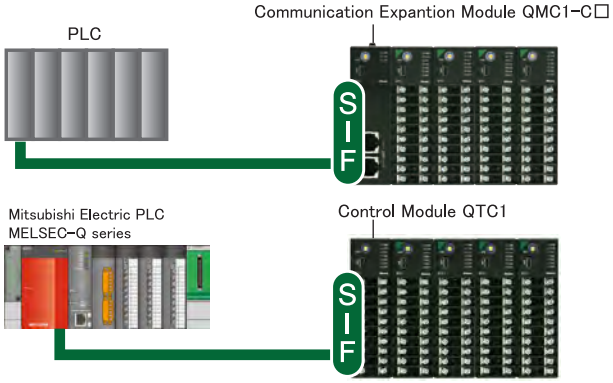
1 Program-less connections to PLCs for reduced work (SIF function)

The Smart InterFace (SIF) function (program-less PLC communication function) enables direct connectivity to PLCs from various manufacturers.
(Connect up to 1 unit to one bus)

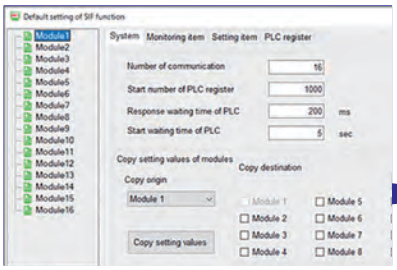
Supported PLC

Manufacturer	Resister	Communication command	
Mitsubishi Electric	D resister	QR/QW	(*)
Mitsubishi Electric	R resister	QR/QW	
Mitsubishi Electric	D resister	WR/WW	
Mitsubishi Electric	R resister	WR/WW	
OMRON	DM resister	FINS command	
KEYENCE	DM resister	RDS/WRS	

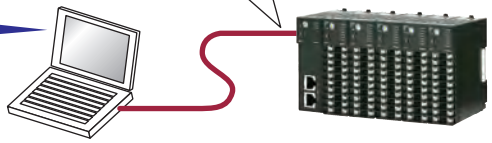
(*) The SIF function of the control module QTC1 is exclusively for Mitsubishi Electric Corporation PLC D register QR/QW.



Settings can be easily changed using the console software, making it possible to manage multiple modules at once.
OS: Windows 10 Windows 11 (Japanese/English)



Commercially available cables (Micro USB Type-B) can be used as connecting cables.



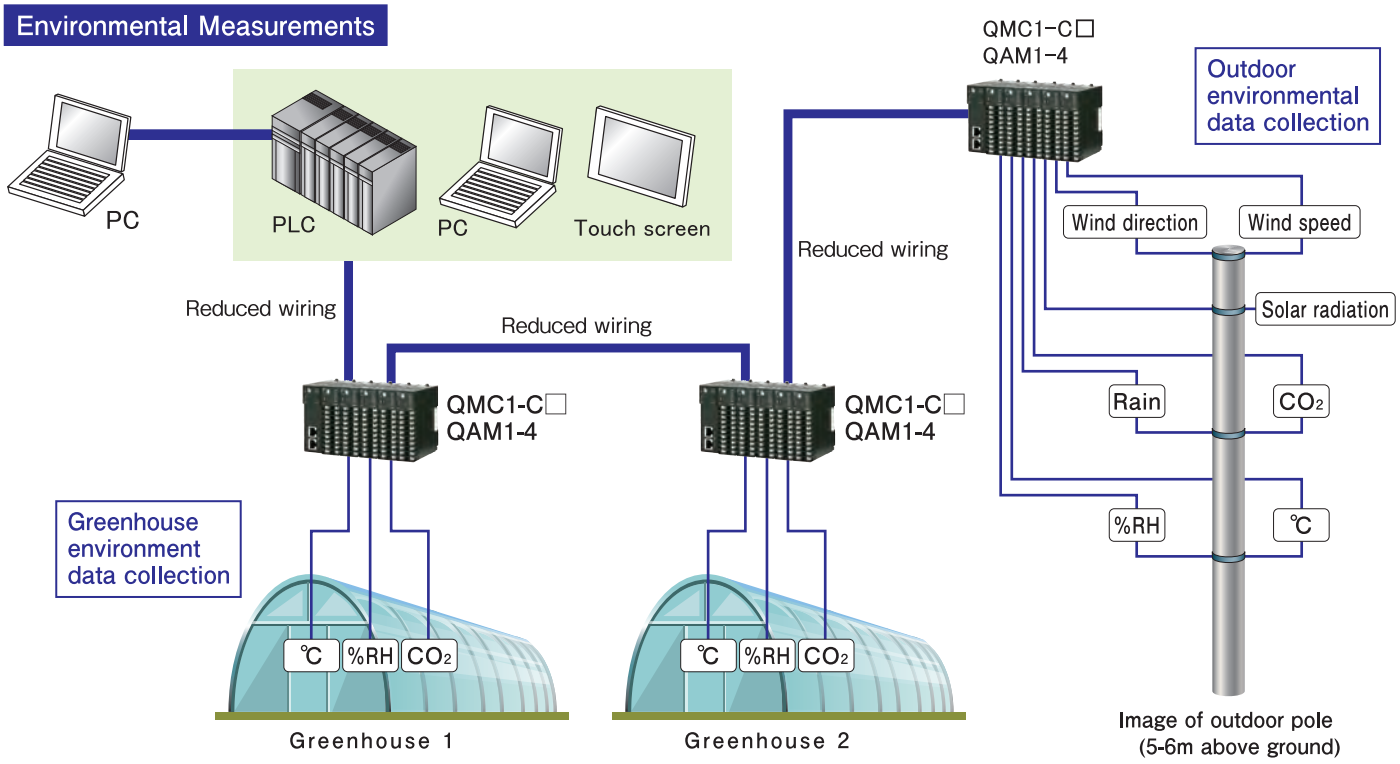
Please use Communication Expansion Module QMC1-C□ when replacing Shinko C series devices.

Some communication commands are different.
When replacing the C series with the QX1 series, please contact us.

2 Usable as an analog module for reducing initial costs and wiring

Using the QMC1-C□+QAM1-4 series as an analog module helps reduce initial costs and wiring work.

Environmental Measurements



Administrative support

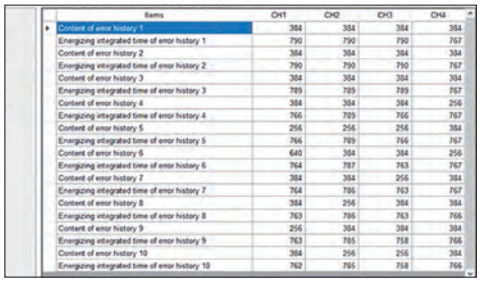
1 Failure prediction maintenance

Failure prediction maintenance

Check usage statuses using the following measurement functions.

1. Cumulative heater energization time (QTC1)
2. Cumulative module energization time (QMC1, QTC1)
3. Cumulative relay contact open/close count (QTC1)

In the event of an error, the error number and energization time are saved. The 10 most recent errors are saved. (Error history: Can be checked with console software) (QTC1)



The input difference detection function makes it possible to monitor for input differences between channels.

Risk avoidance in case of emergency

The output selection function can be used to switch between outputs. For example, in the event of a CH1 output failure, it switches to CH2 output.

A signal can be output if heater burnout is detected. (QTC1)
[Heater burnout alarm options: Single-phase, 3-phase (3-phase: QTC1-2 only)]

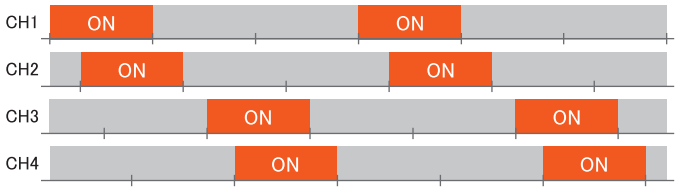
Alarm output signal can be output or control can be started or stopped.
[Event input/output (optional)]

2 Peak power suppression function for lower power equipment costs

Peak power suppression function

The total current can be set for the module, and power suppression control can be performed when the sum of the current values set for each channel is less than or equal to the total current. This can help minimize investments in power equipment.

■Example of peak power suppression function output timing

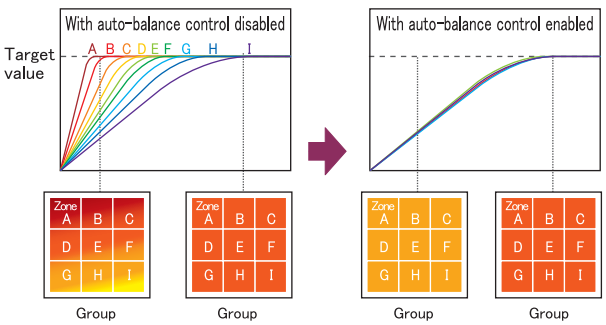


3 Improved product quality

Multi-zone connection (Auto-balance control)

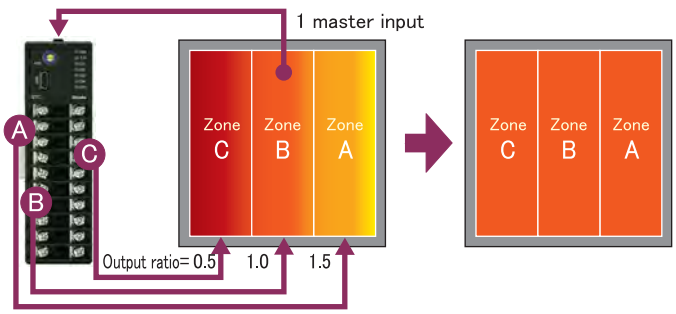
Take advantage of uniform control of multiple control locations (zones) of a control target (group) through linking. This helps prevent partial burning and mechanical distortion while also reducing adverse effects on product quality.

Auto-balance control works with multiple connected modules.



Individual output amount settings (output gain, bias control)

If required distributions of output amount are known in advance, such as when controlling heaters in multiple locations (zones) for a single input point, uniform control of multiple zones is possible. Combining output selection functions reduces the number of input terminals needed, initial costs can also be reduced.



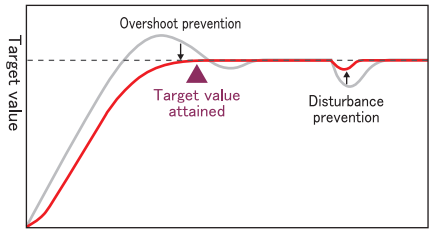
Rich functions

1 Five included control methods for reduced manual labor

Control characteristics vary depending on the control target.
The QX1 series includes five control methods to meet a variety of control characteristics.

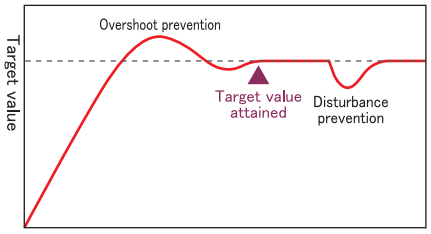
2DOF PID control

In addition to target value tracking and disturbance responsiveness, this well-balanced system reduces overshooting.
(When using default control action.)



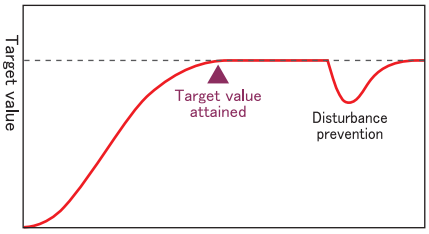
Fast-PID control

This control method emphasizes target value tracking.
This control method works best when replacing the controller with a Shinko product.
(Doing so provides better performance.)



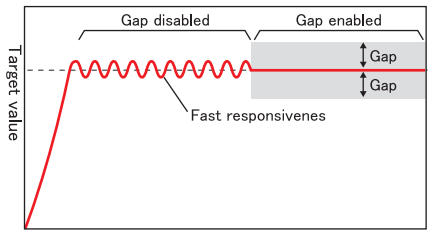
Slow-PID control

This control method prioritizes preventing overshooting rather than time of attaining a target value.



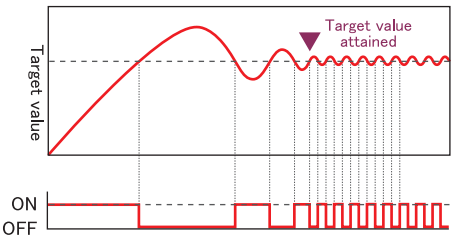
Gap-PID control

This control method is effective with fast responses such as for flow rates and valves. (Deviation characteristics are provided within the gap.)



ON-OFF control

This control method is selected for operating devices that turn heaters and other equipment on or off.



2 Maintenance improvements

The numerous LEDs allow users to visually check statuses and errors on-site.
The plug is removable, making wiring easy. (connector type)

Settings can be easily changed using the console software, making it possible to manage multiple modules at once.
OS: Windows 10 Windows 11 (Japanese/English)

Commercially available cables (Micro USB Type-B) can be used as connecting cables.

3 Heating/cooling control

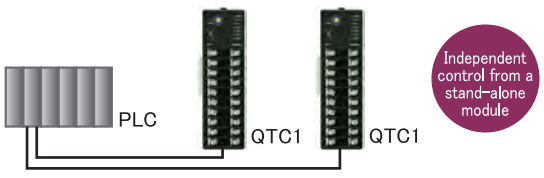
Heating/Cooling control is pefromed with CH1 used as the heating-side input and CH2 as the cooling-side input.
(Up to 2 loops are possible with the QTC1-4.)

4 Cascade control

MV is calculated from SV and PV of CH1, and is used as SV of CH2, with which CH2 control computation is carried out, then outputs from CH2 control output.
(Up to 2 loops are possible with the QTC1-4.)

5 Hight functionality even when used independently

When used independently, the QTC1 can be used for control or to communicate with a host, and adding monitoring targets is easy.



Model

Control Module (2ch)
QTC1-2

Control Module (4ch)
QTC1-4

Model name

QTC1-2	□	□	-□	□			□	□			-□	□	
QTC1-4	□	□	-□	□	□	□	□	□	□	□	-□	□	
Power supply / communication options	0												No options
	P												With power supply / host communication function
	C												With power supply / CUnet communication function
Wiring method		T											Terminal block type
		C											Connector type
CH1 control output			□										See output code table
CH2 control output				□									
CH3 control output (*1)					□								
CH4 control output (*1)						□							
CH1 input							□						See input code table
CH2 input								□					
CH3 input (*1)									□				
CH4 input (*1)										□			
Heater burnout alarm options(*2)											0		No options
											2		4 points CT, 20 A (*3) (*4)
											A		4 points CT, 100 A (*3) (*4)
Event input/output options												0	No options
												1	Event input (4 points)(*5) (*6)
												2	Event output (4 points) (*5) (*6)

(*1) For the QTC1-2, CH3 and CH4 are not available.
(*2) Cannot be added to Direct current output type or DC voltage output type.
(*3) CT and connector harness are sold separately.
(*4) Single-phase or 3-phase is available for the QTC1-2.
(*5) Connector harness is sold separately.
(*6) For the QTC1-2, Event input/output (2 points)

Intput code table

Code	Input Type	Range
M	Thermocouple K	-200 to 1370℃
	Thermocouple K	-200.0 to 400.0℃
	Thermocouple J	-200 to 1000℃
	Thermocouple R	0 to 1760℃
	Thermocouple S	0 to 1760℃
	Thermocouple B	0 to 1820℃
	Thermocouple E	-200 to 800℃
	Thermocouple T	-200.0 to 400.0℃
	Thermocouple N	-200 to 1300℃
	Thermocouple PL-Ⅱ	0 to 1390℃
	Thermocouple C	0 to 2315℃
	Thermocouple K	-328 to 2498℉
	Thermocouple K	-328.0 to 752.0℉
	Thermocouple J	-328 to 1832℉
	Thermocouple R	32 to 3200℉
	Thermocouple S	32 to 3200℉
	Thermocouple B	32 to 3308℉
	Thermocouple E	-328 to 1472℉
	Thermocouple T	-328.0 to 752.0℉
	Thermocouple N	-328 to 2372℉
	Thermocouple PL-Ⅱ	32 to 2534℉
	Thermocouple C	32 to 4199℉
	RTD Pt100	-200.0 to 850.0℃

M	RTD Pt100	-328.0 to 1562.0℉
	DC voltage input 0 to 1 V DC	-32768 to 32767
	Direct current input 4 to 20 mA DC (Externally mounted shunt resistor)	-32768 to 32767
	Direct current input 0 to 20 mA DC (Externally mounted shunt resistor)	-32768 to 32767
A	Direct current input 4 to 20 mA DC (Built-in shunt resistor)	-32768 to 32767
	Direct current input 0 to 20 mA DC (Built-in shunt resistor)	-32768 to 32767
V	DC voltage input 0 to 5 V DC	-32768 to 32767
	DC voltage input 1 to 5 V DC	-32768 to 32767
	DC voltage input 0 to 10 V DC	-32768 to 32767

Output Codes table

Code	Output Type
R	Relay contact output
S	Non-contact voltage output (for driving SSR)
A	Direct current output, 4 to 20 mA DC
0	Direct current output, 0 to 20 mA DC
V	DC voltage output, 0 to 1 V DC
1	DC voltage output, 0 to 5 V DC
2	DC voltage output, 1 to 5 V DC
3	DC voltage output, 0 to 10 V DC
C	Open collector output

Specifications

Rated Scale

Input (TC)	Scale Range		Resolution	Input (RTD)	Scale Range		Resolution
K	-200 to 1370℃	-328 to 2498℉	1℃(℉)	Pt100	-200.0 to 850.0℃	-328.0 to 1562.0℉	0.1 ℃(℉)
	-200.0 to 400.0℃	-328.0 to 752.0℉	0.1 ℃(℉)				
J	-200 to 1000℃	-328 to 1832℉	1℃(℉)				
R	0 to 1760℃	32 to 3200℉	1℃(℉)				
S	0 to 1760℃	32 to 3200℉	1℃(℉)	Input (DC)	Scale Range		Resolution
B	0 to 1820℃	32 to 3308℉	1℃(℉)	4 to 20 mA	-32768 to 32767(*)		1
E	-200 to 800℃	-328 to 1472℉	1℃(℉)	0 to 20 mA			
T	-200.0 to 400.0℃	-328.0 to 752.0℉	0.1℃(℉)	0 to 1 V			
N	-200 to 1300℃	-328 to 2372℉	1℃(℉)	0 to 5 V			
PL-Ⅱ	0 to 1390℃	32 to 2534℉	1℃(℉)	1 to 5 V			
C	0 to 2315℃	32 to 4199℉	1℃(℉)	0 to 10 V			

(*) Scalable

Input	Thermocouple (TC): K, J, R, S, B, E, T, N, C, PL-Ⅱ External resistance: 100 Ω or less (However, B input: 40 Ω or less) RTD: Pt100, 3-wire type Allowable input lead wire resistance: 10 Ω or less per wire Direct current (mA DC): 0 to 20 mA DC, 4 to 20 mA DC Input impedance: 50 Ω (Shunt resistance) Allowable input current: 50 mA or less DC voltage (V DC): 0 to 1 V DC Input impedance: 1 MΩ or more Allowable input voltage: 5 V DC or less Allowable signal source resistance: 2 kΩ or less 0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC Input impedance: 100 kΩ or more Allowable input voltage: 15 V DC or less Allowable signal source resistance: 100 Ω or less
Base accuracy	At ambient temperature of 23℃ and mounting angle of ±5 degrees Thermocouple: Within ±0.2% of each input span However, below 0℃ (32℉): Within ±0.4% of each input span R, S inputs, 0 to 200℃ (32 to 392℉): Within ±6℃ (12℉) B input, 0 to 300℃ (32 to 572℉): Accuracy is not guaranteed. RTD: Within ±0.1% of each input span Direct current: Within ±0.2% of each input span DC voltage: Within ±0.2% of each input span
Cold junction temperature compensation accuracy	Within ±1℃ at -10 to 55℃
Effect of ambient temperature	Thermocouple input (no decimal point): Within ±100 ppm/℃ of each input span Below 0℃ (32℉): Within ±200 ppm/℃ of each input span Thermocouple input (decimal point): Within ±200 ppm/℃ of each input span Below 0℃ (32℉): Within ±400 ppm/℃ of each input span Others : Within ±100 ppm/℃ of each input span
Effects of electromagnetic interference	Within ±1% of each input span
Input sampling period	20 ms (with only DC voltage input and Direct current input enabled) 50 ms (with only DC voltage input and Direct current input enabled) 125 ms Note: Fixed to 125 ms regardless of settings for thermocouple input and RTD input
Control action	2DOF PID control A control method that offers both tracking characteristics with SV changes, and disturbance suppression. This method offers the same disturbance responsiveness as Fast-PID control as well as control actions with reduced overshooting. Fast-PID control This general PID control method is used for constant value control (SV control at a single value). ・P control: When integral time and derivative time are set to 0. ・PI control: When derivative time is set to 0. ・PD control: When integral time is set to 0. ・Deviation PID control: When the proportional gain 2DOF coefficient (α) is set to 1.00 and the derivative 2DOF coefficient (γ, Cd) is set to 1.00. Slow-PID control This control method is effective for processes where generating overshoot is not desired, and processes where the PV does not easily decrease after having exceeded the SV.

Control action

Gap-PID control

If the PV is noisy or if there is hysteresis in the operation unit, a slight fluctuation may be maintained near the deviation of 0. In such cases, a dead band is usually used, but since control is not performed within dead bands, the PV changes in the event of a disturbance. In this way, this control method ensures deviation characteristics in dead bands and allows for disturbance responses.

Item	Setting Range
Proportional band (P)	1 to Input span°C (°F) or 0.1 to Input span°C (°F) When direct current and DC voltage input 0.10 to 100.00% or 0.1 to 1000.0%
Integral time (I)	0 to 3600 sec or 0.0 to 2000.0 sec 1 to 3600 sec or 0.1 to 2000.0 sec (When Slow-PID control is selected) The setting range varies depending on the selected integral/derivative decimal point position.
Derivative time (D)	0 to 3600 sec or 0.0 to 2000.0 sec The setting range varies depending on the selected integral/derivative decimal point position.
Proportional gain 2DOF coefficient (α)	0.00 to 1.00
Integral 2DOF coefficient (β)	0.00 to 10.00
Derivative 2DOF coefficient (γ , Cd)	0.00 to 1.00
Proportional cycle	0.1 to 100.0 sec
Output high limit, output low limit	0.0 to 100.0% Direct current output: −5.0 to 105.0%
Gap width (*)	0.0 to 10.0% Proportional band × Gap width
Gap coefficient (*)	0.0 to 1.0

(*) With Gap-PID control only

ON-OFF control

Control method that operates with only two values of ON and OFF.

Item	Setting Range
ON/OFF hysteresis	0.1 to 1000.0°C (0.1 to 1800.0°F) Direct current input, DC voltage input: 1 to 10000

Control range

When the control range below is exceeded, the control output is turned off.
Control range for thermocouple input (no decimal point)
Input range low limit −50°C (90°F) to Input range high limit +50°C (90°F)
Control range for thermocouple input (with decimal point) and RTD input
Input range low limit −(Input span × 1 %)°C (°F) to Input range high limit +50.0°C (90.0°F)
Control range for direct current and DC voltage input
Scaling low limit −Scaling width × 10% to Scaling high limit + Scaling width × 10%

Control output

Relay contact output: 1a
Control capacity: 3 A 250 V AC (resistive load)
1 A 250 V AC (inductive load $\cos\phi = 0.4$)
Electrical life: 100,000 cycles
Minimum applicable load: 10 mA 5 V DC

Non-contact voltage output (for driving SSR): 12 V DC ± 15%
Max. 40 mA (short circuit protected)
* The power supply is not electrically insulated from the output.

Direct current output: 4 to 20 mA DC, 0 to 20 mA DC (Resolution: 12000)
Load resistance: Maximum 550 Ω
* The power supply is not electrically insulated from the output.

DC voltage output: 0 to 1 V DC, 0 to 5 V DC, 1 to 5 V DC, 1 to 10 V DC (Resolution: 12000)
Allowable load resistance: 1 kΩ or more
* The power supply is not electrically insulated from the output.

Open collector output (NPN): Allowable load current: 100 mA or less
Load voltage: 30 V DC or less

Standard functions

Alarm Function, Loop Break Alarm, Set Value Ramp Function,
Power-On Return Action Selection, Non-Volatile IC Memory Data Save Selection,
Automatic/Manual Control Switching, Sensor Correction Coefficient,
Sensor Correction, Control Function Selection, Extension Function Selection,
Output Gain/Bias Function, Input Calculation Function, Input Difference Detection Function

Optional functions

Heater Burnout Alarm, Event Input, Event Output

Power Supply / Host Communication function (QTC1-2P/QTC1-4P)

Communication line	EIA RS-485 compliant	
Communication method	Half-duplex communication	
Communication speed	Selecting 9600, 19200, 38400, or 57600 bps is possible using the DIP switches. (Factory default: 57600 bps)	
Synchronization method	Start-stop synchronization	
Data bit	Data bits: 8	
Parity	Selecting even, odd, or no parity is possible using the communication specification selection DIP switch. (Factory default : Even)	
Stop bit	Selecting 1 or 2 is possible using the communication specification selection DIP switch. (Factory default: 1)	
Response delay time setting	0 to 1000 ms (Factory default: 0 ms) The response from the module after receiving a command from the host can be delayed.	
Data structure	Communication protocol	MODBUS RTU
	Start bit	1
	Data bit	8
	Parity	Enabled (even, odd), Disabled
	Stop bit	1 or 2

Smart InterFace (SIF) Function (Program-less communication function)

This function enables a serial communication connection with Mitsubishi Electric MELSEC-Q series PLCs and writes/reads various data to/from the PLC register using the PLC communication protocol.
The communication protocol uses QW and QR commands, and PLCs capable of using A-compatible 1C frame AnA/AnU common commands (QR/QW) (D resister) are supported.

Power supply / CUnet communication function (QTC1-2C/QTC1-4C)

Connection type	Multi-drop	
Communication method	2-wire half-duplex	
Synchronization method	Bit-synchronous	
Error detection	CRC-16	
Number of occupied slave addresses	1	
Maximum number of connected nodes	64 nodes	
Communication speed, Communication distance	Communication speed	Maximum network length
	12 Mbps	100m
	6 Mbps	200m
	3 Mbps	300m
Isolation method	Pulse transformer isolation	
Impedance	100 Ω	
Termination resistance	Last connection, set by CUnet slave This instrument is not equipped.	

Attached functions

Power failure countermeasures, Self-diagnosis, Automatic cold junction compensation,
PV filter time constant setting, Moving average count setting, CH enable/disable selection, Overscale, Underscale, Sensor error, Cold junction error, ADC error, Warm-up display, Cumulative contact open/close count measurement function, Cumulative energization time measurement function, Cumulative heater energization

Power supply voltage

24 V DC Allowable voltage fluctuation range: 20 to 28 V DC

Accessories (Sold Separately)

Product Name	Model
Shunt resistor 50 Ω	RES-S01-050
Termination resistor 100 Ω	RES-S07-100
Front terminal cover	TC-QTC
CT for 20 A	CTL-6-S-H (*1)
CT for 100 A	CTL-12-S36-10L1U (*1)
Connector harness for heater burnout alarm	WQ (*1)
Connector harness for event input/output	EVQ (*2)

(*1) For heater burnout alarm (heater burnout alarm option symbols: 2, A)
(*2) For event input or event output (event input/output option symbols: 1, 2)
When using only event input 1, 2 or event output 1, 2, one is required; when using event inputs 1 to 4 or event outputs 1 to 4, two are required.

Communication Expansion Module QMC1-C□

Model name

QMC1	-□	□	-□	
Communication type	C4			RS-422A
	C5			RS-485 (*1)
Event input/ output options		0		No options
		1		Event input 4 points (*2)
		2		Event output 4 points (*2)
		3		Event input 2 points, Event output 2 points (*2)
Communication protocol			0	Console selection (MODBUS RTU / SIF) (*1)
			1	C series compatible

(*1): When connecting to an OMRON PLC or Keyence PLC using the SIF function (Smart InterFace, program-less communication function), it cannot be connected using the RS-485 communication type (QMC1-C5□). Use communication type RS-422A(QMC1-C4□).
(*2): The plug side connector of the event input/output connector is sold separately.

Specifications

Communication lines	EIA RS-422A compliant EIA RS-485 compliant
Communication method	Half-duplex communication
Synchronization method	Start-stop synchronization
Communication speed	Selecting 9600, 19200, 38400, or 57600 bps is possible using the DIP switches. (Factory default: 9600 bps)
Data bit/ parity	Data bit: 7 bits, 8 bits (Factory default: 8 bits) Parity bit: With parity, No parity (Factory default: With parity) Parity: Even, Odd (Factory default: Even) Select by communication specification selection DIP switch
Stop bit	Selecting 1 or 2 is possible using the communication specification selection DIP switch. (Factory default: 1 bit)
Response delay time setting	0 to 1000 ms (Factory default: 0 ms) The response from the module after receiving a command from the host can be delayed.
Communication protocol (Set with console software)	Communication protocol / Register / Communication command MODBUS RTU / – / – Made by Mitsubishi Electric / D register / QR/QW Made by Mitsubishi Electric / R register / QR/QW Made by Mitsubishi Electric / D register / WR/WW Made by Mitsubishi Electric / R register / WR/WW Made by OMRON / DM register / FINS command Made by Keyence / DM register / RDS/WRS C series compatible protocols are selected by model name.
Number of connections	Control module: Max. 16 modules
Event Input (optional)	No. of inputs 4 or 2 Input method Voltage contact input sink method Circuit current when closed Approx. 6 mA Reading judgment time Approx. 100 ms
Event Output (optional)	No. of outputs 4 or 2 Circuit NPN open collector Maximum load voltage 30 V DC Maximum load capacity 50 mA
Attached functions	Power failure countermeasure, Self-diagnosis, Warm-up display, Cumulative energization time measurement function
Power supply voltage	24 V DC Allowable voltage fluctuation range: 20 to 28 V DC

Accessories (Sold Separately)

Product Name	Model
Communication cable (USB Type A – Modular)	CMC-001-4
Communication cable [Modular - Y terminal (RS-485, 3-wire)]	CQM-001
Communication cable [Modular - Y terminal (RS-422A, 5-wire)]	CQM-002
Communication cable (Modular – Modular)	CQQ-001
Wiring connector	0225-0805 (*)

(*): For event input/output (event input/output option symbols: 1, 2, 3)

Communication Expansion Module QMC1-MT

Model name

QMC1-MT

Specifications

Ethernet communication	Connects to the control module (QTC1-□) for Ethernet communication (MODBUS/TCP or SIF function). MODBUS/TCP Physical layer 10BASE-T/100BASE-TX automatic recognition User layer MODBUS/TCP Number of connections: 1
SIF function	This function reads and writes various data to PLC registers using the communication protocol of Mitsubishi Electric Corporation's PLC MELSEC. User layer TCP/IP Mitsubishi Electric Corporation PLC MELSEC Communication Protocol Frame: QnA compatible 3E frame (SLMP 3E frame) Code: Binary or ASCII Connectable PLC: 1 unit
Module-to-module communication	Communication line: Internal Bus Communication method: Half-duplex communication Synchronization method: Start-stop synchronization Communication speed: 57600 bps Data bit/Parity/Stop bit: Data bit: 8, Parity: Even, Stop bit: 1
Attached functions	Power failure countermeasure, Watchdog timer, Warm up indication,
Power supply voltage	24 V DC Allowable voltage fluctuation range: 20 to 28 V DC

4 points analog I/O Module
QAM1-4

Model name

QAM1-4	□	□	-□	-□	□	□	□	□	□	□	□	
Power supply / communication option	0											No options
	P											With power supply / host communication function
	C											With power supply / CUnet communication function
Wiring type		T										Terminal block type
		C										Connector type
I/O type (*)			-0									Input 4 points
			-1									Output 4 points
			-2									I/O 4 points each
Analog output 1				-□								Refer to output code table
Analog output 2					□							
Analog output 3						□						
Analog output 4							□					
Analog intput 1								□				Refer to input code table
Analog intput 2									□			
Analog intput 3										□		
Analog intput 4											□	

(*): For input-only type, output code selection is invalid.
For output-only type, input code selection is invalid.

Output code table

Output code	Output type
A	DC current output 4 to 20 mA DC
0	DC current output 0 to 20 mA DC
V	DC voltage output 0 to 1 V DC
1	DC voltage output 0 to 5 V DC
2	DC voltage output 1 to 5 V DC
3	DC voltage output 0 to 10 V DC
N(*)	No output

(*): Output code N is valid only when I/O type 0 (input 4 points) is selected.

Intput code table

Input code	Input type		Range
M	Thermocouple input	K	-200 to 1370°C
		K	-200.0 to 400.0°C
		J	-200 to 1000°C
		R	0 to 1760°C
		S	0 to 1760°C
		B	0 to 1820°C
		E	-200 to 800°C
		T	-200.0 to 400.0°C
		N	-200 to 1300°C
		PL-Ⅱ	0 to 1390°C
		C(W/Re5-26)	0 to 2315°C
		K	-328 to 2498°F
		K	-328.0 to 752.0°F
		J	-328 to 1832°F
		R	32 to 3200°F
		S	32 to 3200°F
		B	32 to 3308°F
		E	-328 to 1472°F
		T	-328.0 to 752.0°F
		N	-328 to 2372°F
		PL-Ⅱ	32 to 2534°F
		C(W/Re5-26)	32 to 4199°F
	RTD input	Pt100	-200.0 to 850.0°C
		Pt100	-328.0 to 1562.0°F
	DC voltage input	0 to 1 V DC	-2000 to 10000
	DC current input	4 to 20 mA DC (External receiving resistor)	-2000 to 10000
		0 to 20 mA DC (External receiving resistor)	-2000 to 10000
A	DC current input	4 to 20 mA DC (Built-in receiving resistor)	-2000 to 10000
		0 to 20 mA DC (Built-in receiving resistor)	-2000 to 10000
V	DC voltage input	0 to 5 V DC	-2000 to 10000
		1 to 5 V DC	-2000 to 10000
		0 to 10 V DC	-2000 to 10000
N(*)	No input		

(*): Input code N is valid only when I/O type 1 (output 4 points) is selected.

Specifications

Rated Scale

Input	Input Range		Resolution
K	-200 to 1370°C	-328 to 2498°F	1°C (°F)
K	-200.0 to 400.0°C	-328.0 to 752.0°F	0.1°C (°F)
J	-200 to 1000°C	-328 to 1832°F	1°C (°F)
R	0 to 1760°C	32 to 3200°F	1°C (°F)
S	0 to 1760°C	32 to 3200°F	1°C (°F)
B	0 to 1820°C	32 to 3308°F	1°C (°F)
E	-200 to 800°C	-328 to 1472°F	1°C (°F)
T	-200.0 to 400.0°C	-328.0 to 752.0°F	0.1°C (°F)
N	-200 to 1300°C	-328 to 2372°F	1°C (°F)
PL-Ⅱ	0 to 1390°C	32 to 2534°F	1°C (°F)
C(W/Re5-26)	0 to 2315°C	32 to 4199°F	1°C (°F)
Pt100	-200.0 to 850.0°C	-328.0 to 1562.0°F	0.1°C (°F)
0 to 1 V DC	-32768 to 32767 (Scaling possible)		1
4 to 20 mA DC	-32768 to 32767 (Scaling possible)		1
0 to 20 mA DC	-32768 to 32767 (Scaling possible)		1
0 to 5 V DC	-32768 to 32767 (Scaling possible)		1
1 to 5 V DC	-32768 to 32767 (Scaling possible)		1
0 to 10 V DC	-32768 to 32767 (Scaling possible)		1

Input	Thermocouple (TC)	K, J, R, S, B, E, T, N, C (W/Re5-26) (JIS C1602-2015) PL-II (ASTM E1751M-15) External resistance: 100 Ω or less (B 40 Ω or less)
	RTD	Pt100 3-wire type (JIS C1604-2013) Allowable input lead wire resistance: 10 Ω or less per wire
	Direct current (mA DC)	0 to 20 mA DC, 4 to 20 mA DC Input impedance: 50 Ω Allowable input current: 50 mA or less
	DC voltage (V DC)	0 to 1 V DC Input impedance: 1 MΩ or more Allowable input voltage: 5 V DC or less Allowable signal source resistance: 2 kΩ or less 0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC Input impedance: 100 kΩ or more Allowable input voltage: 15 V DC or less Allowable signal source resistance: 100 Ω or less
Output	DC current output	4 to 20 mA DC, 0 to 20 mA DC Load resistance: Max. 550 Ω Non-isolated between power supply and output
	DC voltage output	0 to 1 V DC, 0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC Allowable load resistance: 1 kΩ or more Non-isolated between power supply and output
Power supply voltage	24 V DC Allowable voltage fluctuation range: 20 to 28 V DC	
Input base accuracy	When the ambient temperature is 23°C and the mounting angle is ±5 degrees	
	Thermocouple input	Within ±0.2% of each input span Within 0°C (32°F), within ±0.4% of each input span R, S input, 0 to 200°C (32 to 392°F): Within ±6° C (12°F) B input, 0 to 300°C (32 to 572°F): Accuracy is not guaranteed.
	RTD input	Within ±0.1% of each input span
	Direct current input DC voltage input	Within ±0.2% of each input span
Output base accuracy	When the ambient temperature is 23°C and the mounting angle is ±5 degrees Direct current input, DC voltage input: Within ±0.2% of each output span	
Cold junction compensation accuracy	Within ±1°C at -10 to 50°C	
Effect of ambient temperature	Thermocouple input (no decimal point)	Within ±100 ppm/°C of each input span Less than 0°C (32°F): Within ±200 ppm/°C of each input span
	Thermocouple input (with decimal point)	Within ±200 ppm/°C of each input span Less than 0°C (32°F): Within ±400 ppm/°C of each input span
	Other input	Within ±100 ppm/°C of each input span
	Direct current input DC voltage input	Within ±200 ppm/°C of each input span
Effect of electromagnetic interference	Within ±1% of each input span	
Input sampling period	20 ms (only direct current input and DC voltage input are valid) 50 ms (only direct current input and DC voltage input are valid) 125 ms For thermocouple input and RTD input, fixed to 125 ms	

Digital I/O Module
QDM1

Model name

QDM1−	□	□	□	□	
Points	DI16				Input: 16 points
	DO16				Output: 16 points
	DIO8				Input: 8 points / Output: 8 points
Plus / Minus common		A			Minus common (NPN)
		B			Plus common (PNP)
Power supply / communication option			0		No option
			P		With power supply / host communication function
			C		With power supply / CUnet communication function
Wiring type				T	Terminal block type
				C	Connector type

Specifications

Input	Common	Plus/minus common (NPN/PNP compatible)
	Input points	8 points/16 points
	Input status indicator	Green (LED) lights up when ON
	Allowable supply voltage for input	24 V DC 10%, ripple content less than 5 %p−p
	ON voltage/ON current	15 V DC or more/3.5 mA or more
	OFF voltage/OFF current	5 V DC or less / 1 mA or less
	Input current	5.5 mA or less (at 24 V DC)
	Input resistance	Approx. 4.7 kΩ
	ON delay time	0.2 ms or less
	OFF delay time	0.5 ms or less
	Sampling cycle setting	1 ms, 5 ms by communication Setting range 1 to 100 ms
Output	Common	Minus/plus common (for NPN specification / for PNP specification)
	Output points	8 points/16 points
	Output status indicator	Green (LED) lights up when ON
	Allowable supply voltage for output	24 V DC 10%, ripple content less than 5 %p−p
	Rated output current	0.1 A/point, 1.6 A/common
	Residual voltage	1.2 V or less
	Leakage current	0.1 mA or less
	ON delay time	0.2 ms or less
	OFF delay time	0.5 ms or less
	Overcurrent protection function	Limit current value when overcurrent is detected
	Output setting at communication error	Output status (hold or OFF) can be set until normal data is received in the event of communication error (lasting 1 minute or longer) (factory default: hold)
Power supply voltage	24 V DC Allowable voltage fluctuation range: 20 to 28 V DC	
Attached functions	Watchdog timer, Unapplied digital output power supply, Warm up indication, Cumulative energization time measurement function, Power Failure Countermeasure	
Sold separately	Front terminal cover: TC−QTC (*) Termination resistor 100 Ω: RES−S07−100 (*): QDM1 has the same case shape as QTC1, so the terminal cover of QTC1 is used.	
Power supply / host communication function	Perform the following operations from the external computer. (1) Reading and setting the DO output setting value of each CH (2) Reading DI input status, DO output status, and operation status of each CH (3) Reading and setting the digital input sampling cycle	

Communication line	EIA RS−485	
Communication method	Half−duplex communication	
Synchronization method	Start−stop synchronization	
Communication protocol	MODBUS RTU	
Communication speed	9600 bps, 19200 bps, 38400 bps or 57600 bps can be selected by DIP switch (Factory default: 57600 bps)	
Data bit/Parity/ Stop bit	Select the following with the DIP switch Data bit: 8 Parity: Even, Odd, No parity Stop bit: 1 or 2 (Factory default: 8 bits, Even, 1 bit)	
Communication response delay time	Set the delay time to return the response from the module after receiving the command from the host. 0 to 1000 ms (Factory default: 0 ms)	
Digital input sampling cycle	1 to 100 ms (Factory default: 1 ms)	

Output update cycle	20 ms	
Output circuit response time	100 ms or less (excluding 0 to 90 % communication cycle time)	
Setting accuracy	Same as base accuracy	
Attached functions	Warm up indication, Power failure countermeasure, Self−diagnosis, Automatic cold junction temperature compensation, PV filter time constant setting, Moving average count setting , Overscale, Underscale, Sensor Error, Cold junction error, ADC error, Cumulative energization time measurement function, Error history, Console communication, SIF communication function	
Sold separately	Shunt resistor 50 Ω: RES−S01−050 Front terminal cover: TC−QTC (*) Termination resistor 100 Ω: RES−S07−100 (*): QAM1 has the same case shape as QTC1, so the terminal cover of QTC1 is used.	
Power supply / host communication function	Perform the following operations from the external computer. (1) Reading and setting of various set values (2) PV and operation status reading (3) Change of function	

Communication line	EIA RS−485 (C5 option)
Communication method	Half−duplex communication
Synchronization method	Start−stop synchronization
Communication protocol	MODBUS RTU
Communication speed	9600 bps, 19200 bps, 38400 bps or 57600 bps can be selected by DIP switch (Factory default: 57600bps)
Data bit/Parity/ Stop bit	Select the following with the DIP switch Data bit: 8 Parity: Even, Odd, No parity Stop bit: 1 or 2 (Factory default : 8 bits, Even, 1 bit)
Communication response delay time	Set the delay time to return the response from the module after receiving the command from the host. 0 to 1000 ms

Power supply / CUnet communication function	Connection type	Multi−drop	
	Communication method	2−wire half−duplex	
	Synchronization method	Bit−synchronous	
	Error detection	CRC−16	
	Number of occupied slave addresses	1	
	Maximum number of connected nodes	64 nodes	
	Communication speed, Communication distance	Communication speed	Maximum network length
		12Mbps	100m
		6Mbps	200m
		3Mbps	300m
	Isolation method	Pulse transformer isolation	
	Impedance	100 Ω	
	Termination resistance	Last connection, set by CUnet slave This instrument is not equipped.	

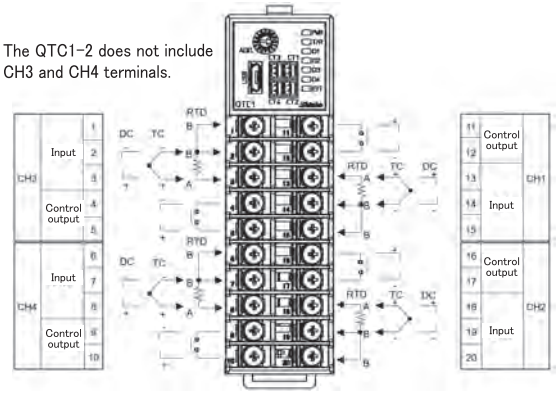
<table>
<tr><td>High-speed communication with QMC1 via internal bus connection</td><td>When DIP switch No. 6 for setting communication specifications is set to ON, the digital I/O data update cycle with QMC1 corresponding to this function is within 10 ms per module.</td></tr>
<tr><td>Power supply / CUnet communication function</td><td>
<table>
<tr><td>Connection type</td><td colspan="2">Multi-drop</td></tr>
<tr><td>Communication method</td><td colspan="2">2-wire half-duplex</td></tr>
<tr><td>Synchronization method</td><td colspan="2">Bit-synchronous</td></tr>
<tr><td>Error detection</td><td colspan="2">CRC-16</td></tr>
<tr><td>Number of occupied slave addresses</td><td colspan="2">1</td></tr>
<tr><td>Maximum number of connected nodes</td><td colspan="2">64 nodes</td></tr>
<tr><td rowspan="4">Communication speed, Communication distance</td><td>Communication speed</td><td>Maximum network length</td></tr>
<tr><td>12Mbps</td><td>100m</td></tr>
<tr><td>6Mbps</td><td>200m</td></tr>
<tr><td>3Mbps</td><td>300m</td></tr>
<tr><td>Isolation method</td><td colspan="2">Pulse transformer isolation</td></tr>
<tr><td>Impedance</td><td colspan="2">100 Ω</td></tr>
<tr><td>Termination resistance</td><td colspan="2">Last connection, set by CUnet slave
This instrument is not equipped.</td></tr>
</table>
</td></tr>
</table>

Terminal Arrangement

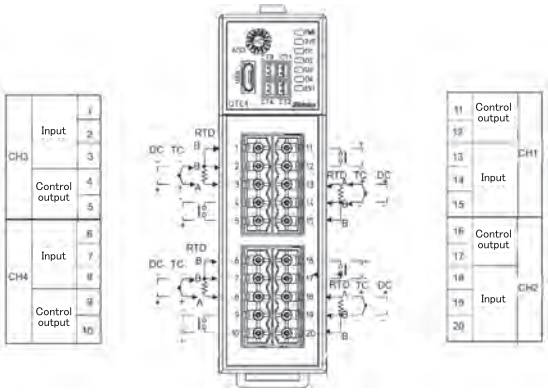
Control Module QTC1-2/QTC1-4

Terminal block type

The QTC1-2 does not include CH3 and CH4 terminals.



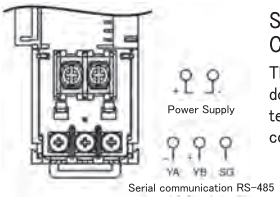
Connector type



Power supply and communication terminal arrangement

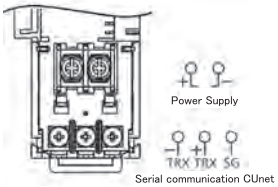
Serial communication RS-485

The QTC1-20 and QTC1-40 do not include a power supply terminal and RS-485 serial communication terminal.



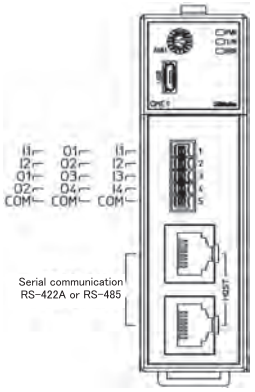
Serial communication CUnet

The QTC1-20 and QTC1-40 do not include a power supply terminal and CUnet serial communication terminal.

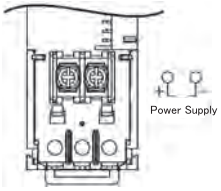


Communication Expansion Module QMC1-C☐

Pin assignment of event input/output and serial communication

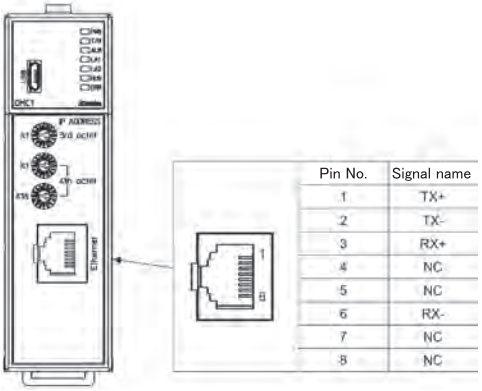


Power supply terminal arrangement



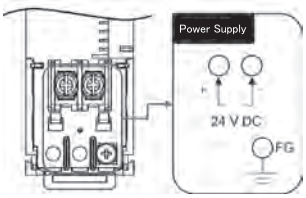
Communication Expansion Module QMC1-MT

Pin assignment of Ethernet communication connector



Pin No.	Signal name
1	TX+
2	TX-
3	RX+
4	NC
5	NC
6	RX-
7	NC
8	NC

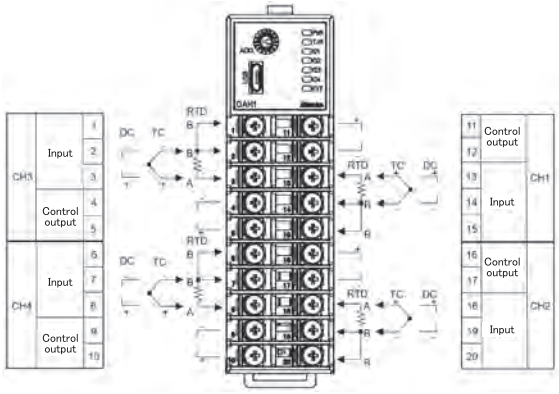
Power supply terminal and FG terminal arrangement



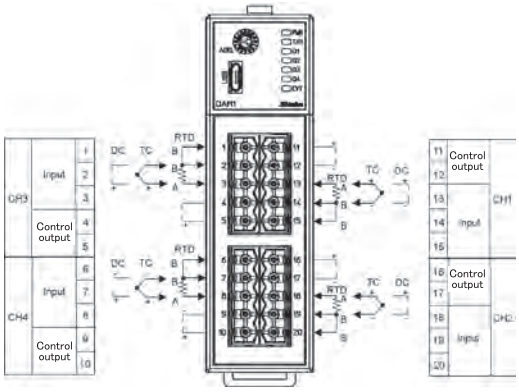
Terminal Arrangement

4 points analog I/O Module QAM1-4

Terminal block type

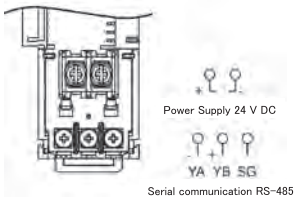


Connector type

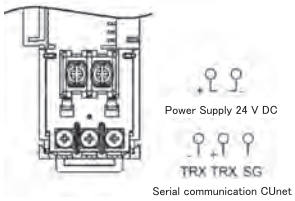


Power supply and communication terminal arrangement

Serial communication
RS-485



Serial communication
CUnet

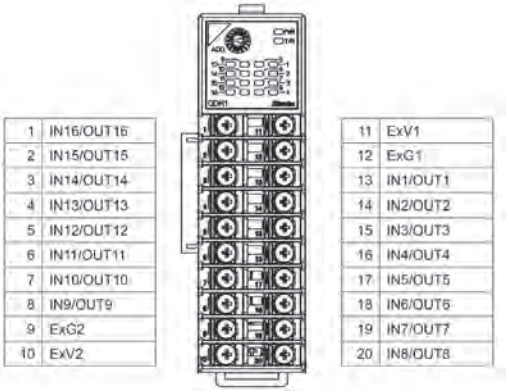


Digital I/O Module QDM1

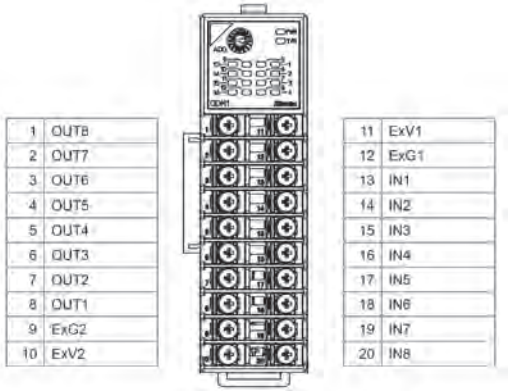
Input and output terminal arrangement

Terminal block type

QDM1-D□16□0T

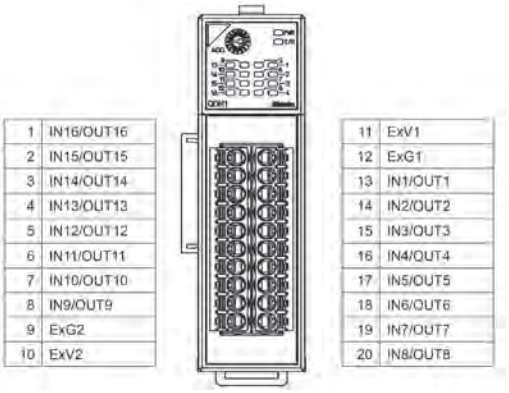


QDM1-DIO8□0T

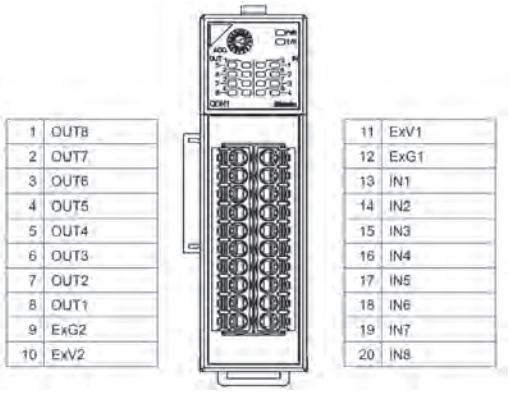


Connector type

QDM1-D□16□0C



QDM1-DIO8□0C



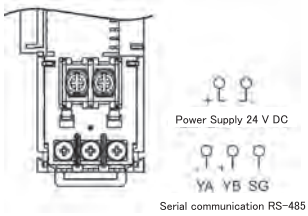
Terminal Arrangement

Digital I/O Module QDM1

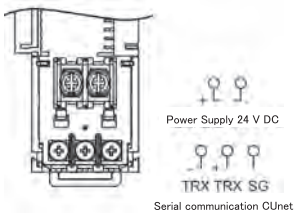
Input and output terminal arrangement

■ Power supply and communication terminal arrangement

Serial communication
RS-485



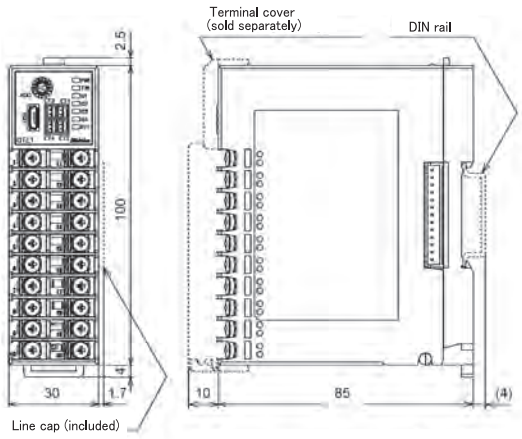
Serial communication
CUnet



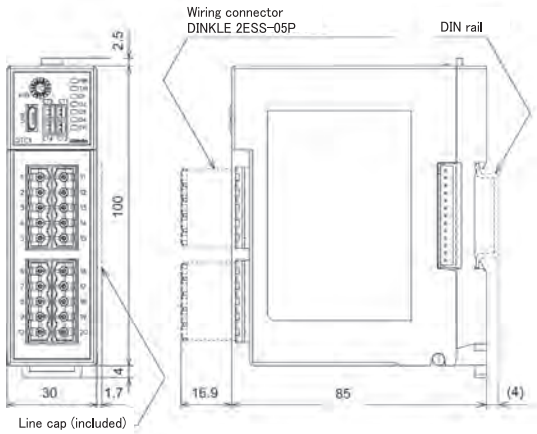
Dimensions (Scale: mm)

Control Module QTC1-2/QTC1-4

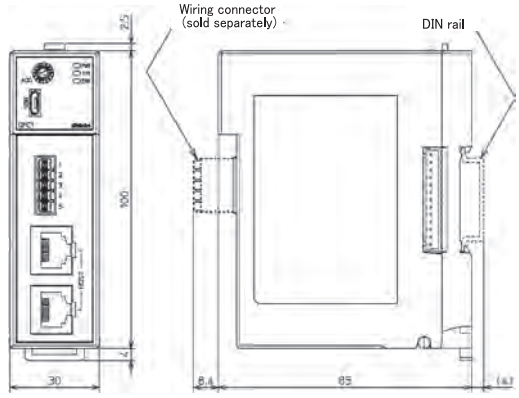
■ Terminal block type



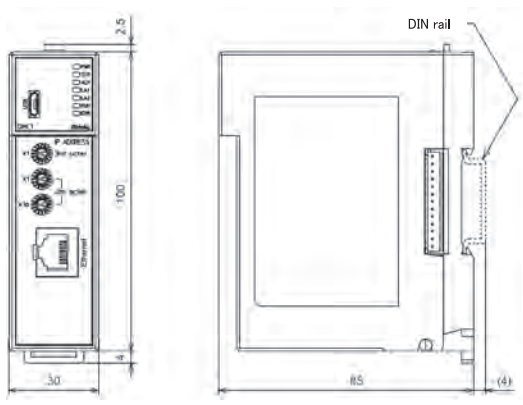
■ Connector type



Communication Expansion Module QMC1-C□



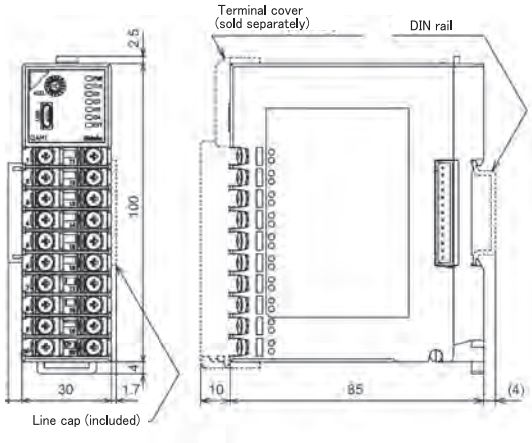
Communication Expansion Module QMC1-MT



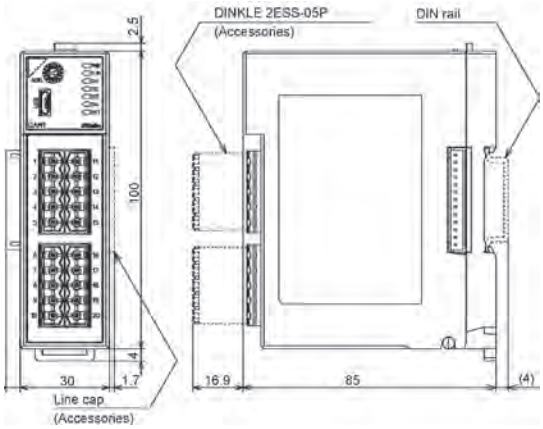
Dimensions (Scale: mm)

4 points analog I/O Module QAM1-4

Terminal block type

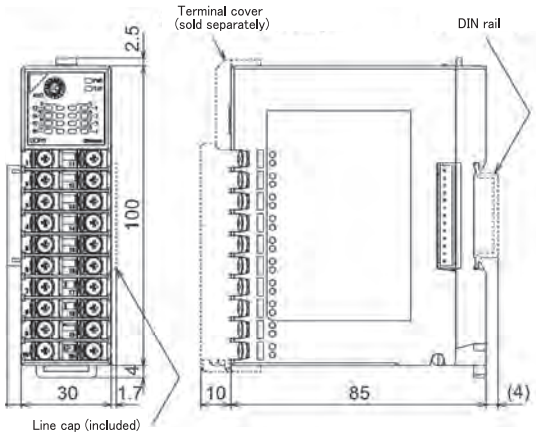


Connector type



Digital I/O Module QDM1

Terminal block type



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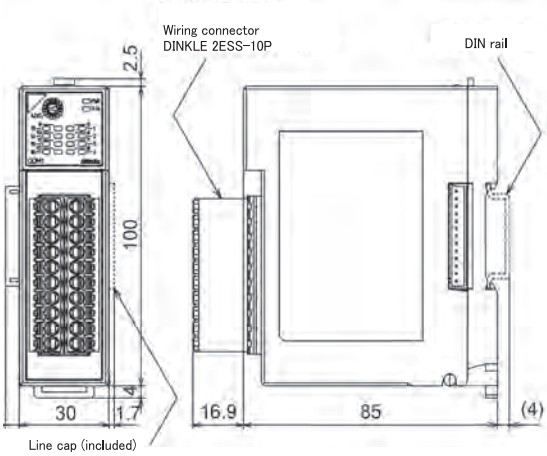

SAFETY PRECAUTIONS

- To ensure safe and correct use, thoroughly read and understand the manual before using this instrument.
- This instrument is intended to be used for industrial machinery, machine tools and measuring equipment. Verify correct usage after consulting with our agency or main office regarding the purpose of use. (Never use this instrument for medical purposes in which human lives are involved.)
- External protection devices such as protection equipment against excessive temperature rise, etc. must be installed, as a malfunction of this product could result in serious damage to the system or injury to personnel. Also, proper periodic maintenance is required.
- This instrument must be used under the conditions and environment described in the manual. Shinko Technos Co., Ltd. does not accept liability for any injury, loss of life or damage occurring due to the instrument being used under conditions not otherwise stated in this manual.

Caution with respect to Export Trade Control Ordinance

To avoid this instrument from being used as a component in or being utilized in the manufacture of weapons of mass destruction (i.e. military applications, military equipment), please investigate the end users and the final use of this instrument. In the case of resale, ensure that this instrument is not illegally exported.

- This catalog is current as of November 2025, and its contents are subject to change without notice.
- The photos in this catalog do not show actual usage.
- If you have any inquiries, please consult us or our agency.

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