Changes for the Better

MITSUBISHI ELECTRIC

PROGRAMMABLE CONTROLLERS

MELSEC Q series

July 2007

New Product Release

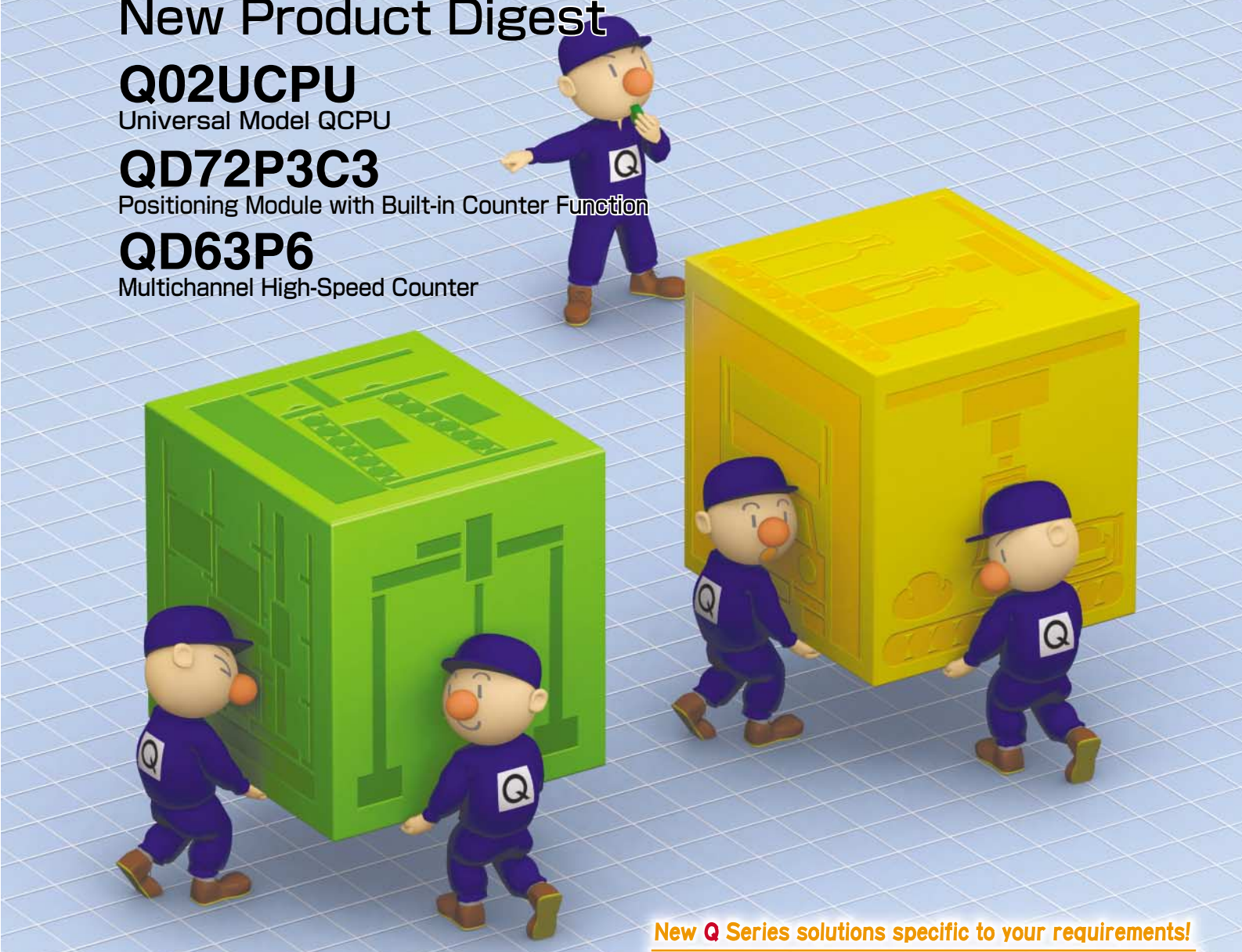
No.297E

New Product Digest

Q02UCPU
Universal Model QCPU

QD72P3C3
Positioning Module with Built-in Counter Function

QD63P6
Multichannel High-Speed Counter



New Q Series solutions specific to your requirements!

Mitsubishi Electric Corporation Nagoya Works is a factory certified for ISO14001 (standards for environmental management systems) and ISO9001(standards for quality assurance management systems)

ISO 14001 JACO EC97J1113 UKAS ENVIRONMENTAL MANAGEMENT 051

ISO 9001 BUREAU VERITAS Certification UKAS QUALITY MANAGEMENT 008

Universal Model QCPU

Q02UCPU

Features

High-speed, high-precision processing!

Faster processing performance

With a programming capacity of 20 k steps and up to 2048 I/O points, this CPU is ideal for small-scale applications. Because of its improved operation performance (basic instruction processing time (LD instruction) is 40 ns, and PC MIX value is 14 instructions/μs), high-speed machine control can be realized.

Basic instruction (LD): 40 ns
PC MIX value: 14 instructions/μs

High precision for complex operation

The CPU has greatly increased floating point (real numder) operation speed for positioning data requiring trigonometric functions such as SIN and COS. Therefore, scan time of programs using real number operation is shortened, cutting down production time.

Real number operation instruction
Single precision addition: 0.18 μs

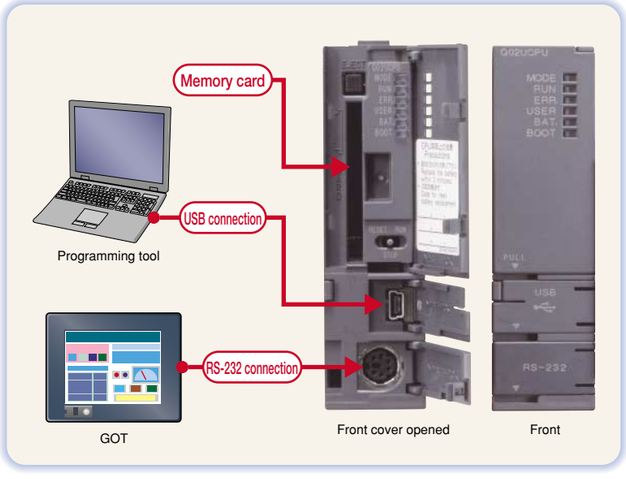
More convenient!

High-speed communication with USB

In addition to RS-232 port, full-speed (12 Mbps) USB 2.0 port is embedded as standard, enabling communication with a PC which does not have a RS-232 port. Also, USB and RS-232 port can be used simultaneously, allowing for connection with PC and GOT.

Easy setup without a program

Initialization of intelligent function modules can be carried out without a program by using GX Configurator. Settings and monitoring operating status are also easy with GX Configurator.



Easy to maintain!

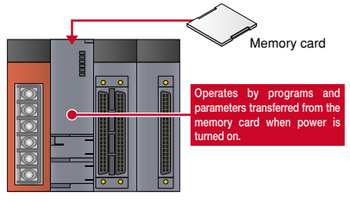
Secures data even after prolonged storage

Programs and parameter files are automatically saved in the program memory (Flash ROM) to prevent data loss due to dead battery. Therefore, data are secured even when the device is stored for a long time.

Simplified program transfer with a memory card

Easy to modify programs of devices at remote locations with just a memory card. Modification time can be reduced drastically. Simply by installing the memory card into the CPU, data can be transferred without using a PC.

STEP 1 Install a memory card.
STEP 2 Turn on the power. (Data transferred from the memory card)
STEP 3 Remove the memory card.



Performance specifications

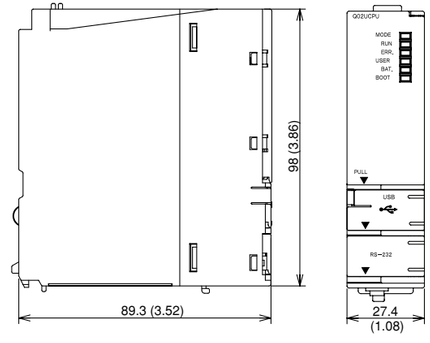
Item		Specifications
Control method		Sequence program control method
I/O control mode		Refresh
Program language (sequence control language)		Relay symbol language (ladder), logic symbolic language (list), MELSAP3 (SFC), MELSAP-L, and structured text (ST)
Processing speed (sequence instruction) (Note 1)	LD instruction	0.04 μs
	MOV instruction	0.08 μs
	PC MIX value (instruction/μs)(Note 2)	14
	Floating point addition	0.18 μs
Total number of instructions(Note 3)		758
Operation (floating point operation) instruction		Yes
Character string processing instruction		Yes
PID instruction		Yes
Special function instruction (Trigonometric function, square root, exponential operation, etc.)		Yes
Constant scan (Function for keeping regular scan time)		0.5 to 2000 ms (setting available in units of 0.5 ms)
Program capacity		20 k steps
Number of I/O device points [X/Y]		8192 points
Number of I/O points [X/Y]		2048 points
Internal relay [M]	(Note 4)	8192 points
Latch relay [L]		8192 points
Link relay [B]		8192 points
Timer [T]		2048 points
Retentive timer [ST]		0 points
Counter [C]		1024 points
Data register [D]		12288 points
Link register [W]		8192 points
Annunciator [F]		2048 points
Edge relay [V]		2048 points
Link special relay [SB]		2048 points
Link special register [SW]		2048 points
File register [R, ZR]		65536 points (Note 5)
Step relay [S]		8192 points
Index register/standard device register [Z]		20 points
Index register [Z] (32-bit ZR indexing)		Max. 10 points (Z0 to Z18) (Index register [Z] is used in double words.)
Pointer [P]		4096 points
Interrupt pointer [I]		256 points
Special relay [SM]		2048 points
Special register [SD]		2048 points
Function input [FX]		16 points
Function output [FY]		16 points
Function register [FD]		5 points
Local device		Yes
Device initial values		Yes

Note 1) The processing speed is the same even when the device is indexed.
Note 2) The PC MIX value is the average number of instructions such as the basic and data processing instructions executed in 1 μs. A larger value indicates a higher processing speed.
Note 3) Intelligent function module dedicated instructions are not included.
Note 4) Indicates the number of points in the default state. This can be changed with the parameter.
Note 5) Indicates the number of points when using the built-in memory (standard RAM). This can be expanded with the SRAM card or Flash card. (Writing from the program is not possible with the Flash card.)
Up to 4184064 points can be used with the SRAM card.

Supported software

Product name	Version
GX Developer	Ver. 8.48A or later

External dimensions



Unit: mm (inch)

Positioning Module with Built-in Counter Function

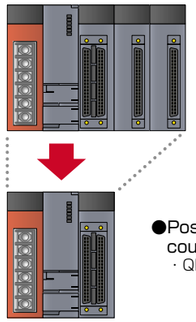
QD72P3C3

Features

Minimized space requirement!

Positioning and counter functions in one module

3-axis positioning and 3-channel counter functions are available in a single module. Extra slots can be used efficiently, allowing for more flexible configuration as well as saving space. Also, system can be configured at lower cost.



●Previous positioning module (3 axes) and counter module (3 channels)
- QD70P4: 1 module (4 channels)
- QD62: 2 modules (2 channels x 2)

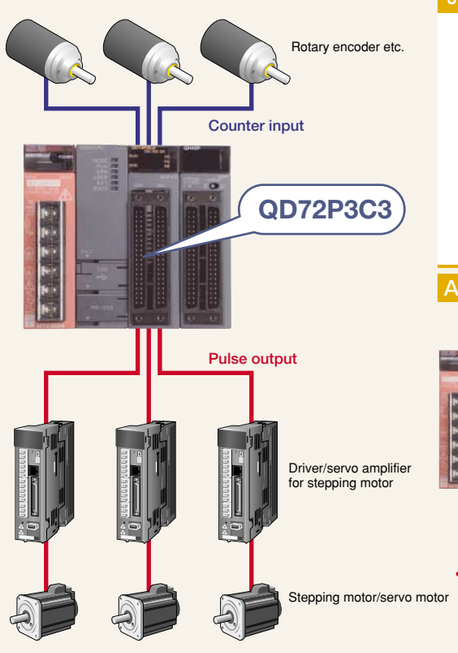
●Positioning module with built-in counter function
- QD72P3C3: 1 module

※Performance specifications differ between previous module and new module.

Optimum solution for specific applications!

Positioning control according to conveyor movement

Positioning can be controlled by confirming actual movement amount from encoder inputs. For example, slip of a conveyor belt can be easily detected, improving positioning accuracy. Of course, speed control by monitoring deceleration is also possible.

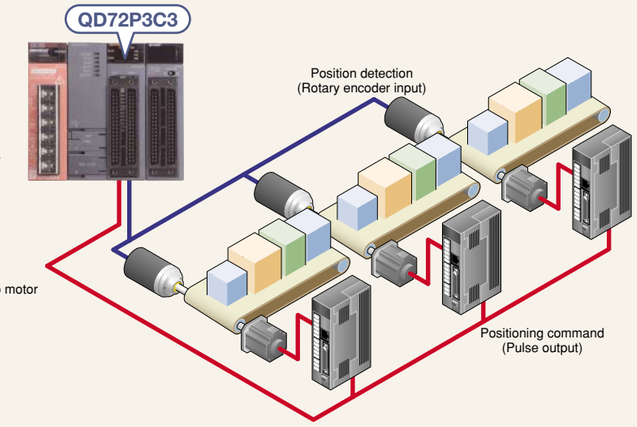


3-axis position control available!

■3-axis pulse input
100 kpps max., open collector output
Control method: PTP (Point to Point) control, speed control

■3-channel counter function
100 kpps, 2-phase counter input
Pulse input mode: CW/CCW, 1 multiple of 2 phases, 2 multiples of 2 phases, 4 multiples of 2 phases
3-axis positioning and 3-channel counter in one. Perfect for material handling and processing equipment which require positioning control by encoder inputs.

Application example Position control of conveyor



Positioning control triggered by matched value

A matched value can be detected by constantly comparing the preset value and current value. Applications with positioning control triggered by the matched point can be created using this function.

Enhanced operability!

Easy to set positioning control

Positioning control is available by setting just 4 positioning data: command speed, acceleration/deceleration time, positioning address/movement amount, and control method (ABS/INC). Also, speed can be changed during control using target speed change function.

Simultaneous change of positioning current feed value and count value

The current feed value and count value can be changed to the same value when either changing the current feed value or presetting the count value. This is ideal for systems which control positioning of motors according to the actual position received from feedback pulse.

Performance specifications

Item				Specifications
Positioning control	Number of axes			3 axes
	Interpolation function			No (Artificial linear interpolation by concurrent start is available.)
	Control method			PTP (Point to Point) control, speed control
	Control unit			Pulse
	Positioning data			1/axis
	Position control method			Incremental system, absolute system
	Position control range			-1073741824 to 1073741823 pulses
	Speed command			1 to 100000 pulses/s (Note 1)
	Acceleration/deceleration processing			Trapezoidal acceleration/deceleration
	Acceleration/deceleration time			1 to 5000 ms
	Start time	Positioning control, speed control	1-axis start	1 ms
			3-axis concurrent start	1 ms
	Pulse output method			Open collector output
	Maximum output pulse			100 kpps
	Data backup			No
Counter function	Number of channels			3 channels
	Count input signal	Phase		1-phase input, 2-phase input
		Signal level		18 mA at 5 V DC/ 2 to 6 mA at 24 V DC
		Pulse input		1 multiple of 2 phases, 2 multiples of 2 phases, 4 multiples of 2 phases, CW/CCW
	Counting speed (max.)			100 kpps
	Counting range			31-bit signed binary (-1073741824 to 1073741823)
External connection				40-pin connector
Applicable connector				A6CON1, A6CON2, A6CON4 (sold separately)
5 V DC internal current consumption				0.57 A
Number of occupied I/O points				32 points (I/O assignment: Intelligent 32 points)
Weight				0.16 kg

Note 1) The setting unit (pulse unit) varies according to the "speed limit value" setting (see below).

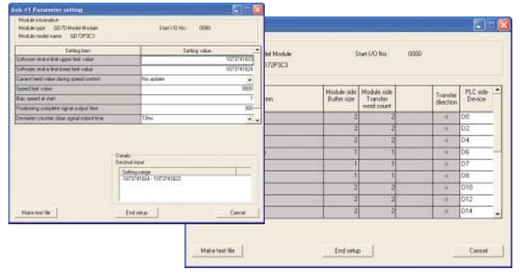
Speed limit value settings (pulse/s)	1 to 8000	8001 to 32000	32001 to 64000	64001 to 100000
Pulse unit	1-pulse units	4-pulse units	8-pulse units	25-pulse units

When the "speed limit value" setting is 100000 (pulse/s) (25-pulse units), set the "speed command" value in multiples of 25. If other values are set, the value will be change to a multiple of 25.

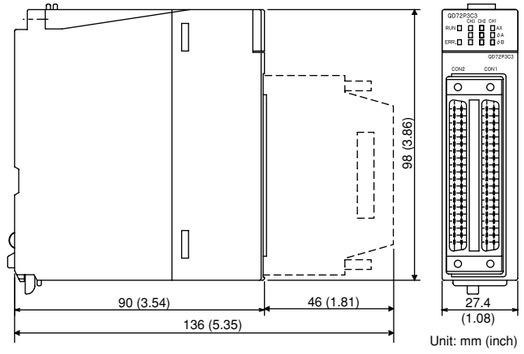
Supported utility package

The utility package (GX Configurator-PT) enables module initialization, auto-refresh settings, monitoring, etc. without a program. No need to concern about I/O signal or buffer memory. GX Configurator-PT is used together with GX Developer.

Product name	Version
GX Configurator-PT	Ver. 1.23Z or later



External dimensions



Multichannel High-Speed Counter Module

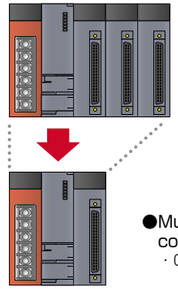
QD63P6

Features

Space efficient!

Realizes small footprint and cost reduction

6-channel input is realized with a single module. (3 times increase compare to QD62) A required number of modules for multiple counter inputs is reduced from 3 to 1, enabling more efficient module arrangement or achieving smaller footprint. Moreover, by minimizing cost per channel, system can be configured at lower cost.



●Previous high-speed counter module
· QD62: 3 modules (2 channels x 3)

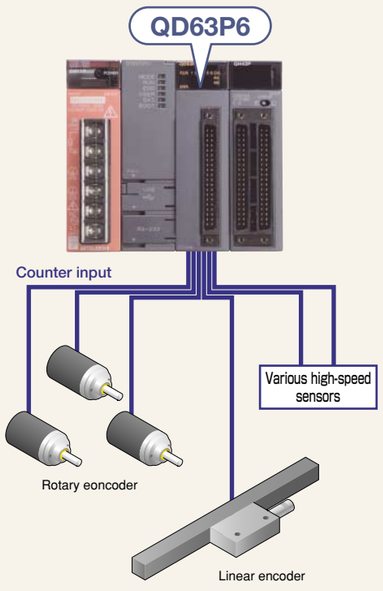
●Multichannel high-speed counter module
· QD63P6: 1 module

※Performance specifications differ between previous module and new module.

Optimum solution for specific applications!

Multiaxis positioning detection and completed task count

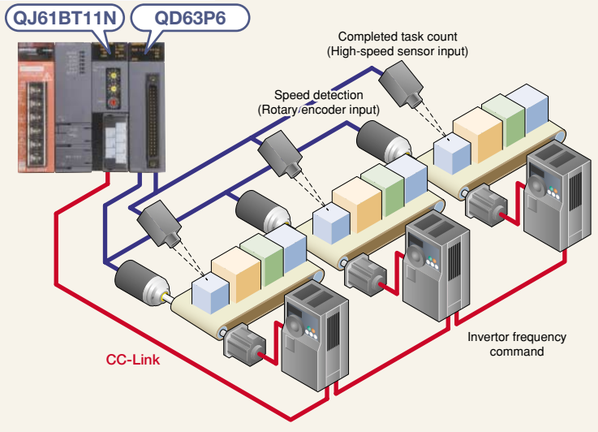
This is an ideal solution for simple multiaxis positioning systems requiring multiple counter inputs. Positioning detection, revolution and speed detection, and cumulative count of high-speed sensor data using inverters are possible.



Pulse input from 6 channels!

■6-channel counter function
200 kpps max., 2-phase input
Pulse input mode: CW/CCW, 1 multiple of 1 phase, 2 multiples of 1 phase, 1 multiple of 2 phases, 2 multiples of 2 phases, 4 multiples of 2 phases
6-channel counter in one. Perfect for equipment which require multiple encoder inputs (incremental type) or high-speed sensor signal count.

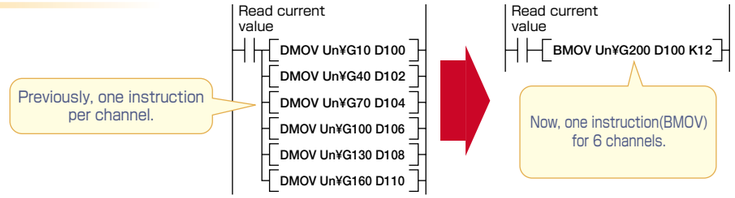
Application example Conveyor speed detection and completed task count



More user-friendly!

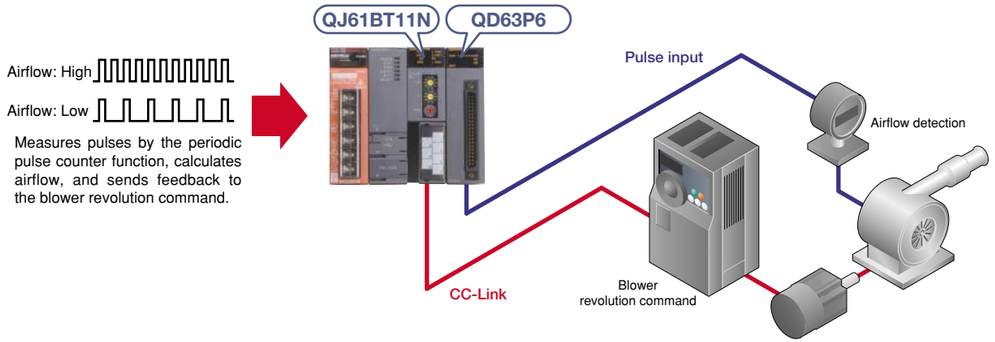
Simplified program

All channels' current value can be read just by one instruction, simplifying programming and checking. Additionally, program execution time can be shortened.



Frequency and speed detection available

Periodic pulse counter function realizes not only positioning detection but also frequency and speed detection. Therefore, this module is also suited for applications requiring flow and speed control.



Performance specifications

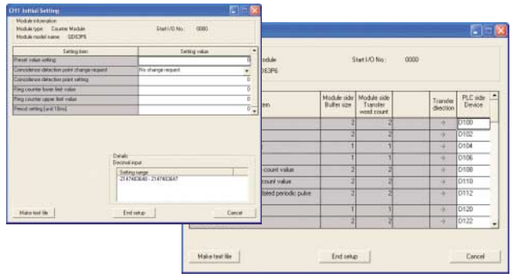
Item		Specifications
Number of channels		6 channels
Count input signal	Phase	1-phase input, 2-phase input
	Signal level (φA, φB)	6.4 to 11.5 mA at 5 V DC
	Pulse input mode	1 multiple of 1 phase, 2 multiples of 1 phase, 1 multiple of 2 phases, 2 multiples of 2 phases, 4 multiples of 2 phases, CW/CCW
Counting speed (max.)		200 kpps, 100 kpps, 10 kpps (Note 1)
Counting range		32-bit signed binary (-2147483648 to 2147483647)
Model		UP/DOWN preset counter + Ring counter function
External connection		40-pin connector
Applicable connector		A6CON1, A6CON2, A6CON4 (sold separately)
5 V DC internal current consumption		0.59 A
Number of occupied I/O points		32 points (I/O assignment: Intelligent 32 points)
Weight		0.15 kg

Note 1) Make the counting speed switch setting with intelligent function module switch.

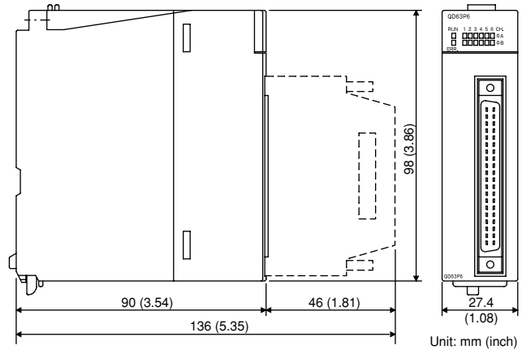
Supported utility package

The utility package (GX Configurator-CT) enables module initialization, auto-refresh settings, monitoring, etc. without a program. No need to concern about I/O signal or buffer memory. GX Configurator-CT is used together with GX Developer.

Product name	Version
GX Configurator-CT	Ver. 1.25AB or later



External dimensions



Product list

Product name	Model	Model code
Universal model QCPU	Q02UCPU	1W4A59
Positioning module with built-in counter function	QD72P3C3	1W4561
Multichannel high-speed counter module	QD63P6	1W4562

Manuals

Manual name	Manual supply status	IB/SH No.	Model code
QCPU (Q Mode) CPU Module User's Manual (Hardware)	Included with base unit	IB-0800061-V or later	13JR96
QCPU User's Manual (Hardware Design, Maintenance and Inspection)	Sold separately	SH-080483ENG-I or later	13JR73
QCPU User's Manual (Function Explanation, Program Fundamentals)	Sold separately	SH-080484ENG-H or later	13JR74
QCPU User's Manual (Multiple CPU System)	Sold separately	SH-080485ENG-D or later	13JR75
Positioning Module with Built-in Counter Function User's Manual (Hardware)	Included	IB-0800388-A	13JY35
Positioning Module with Built-in Counter Function User's Manual	Sold separately	SH-080683ENG-A	13JR99
Multichannel High-Speed Counter Module User's Manual (Hardware)	Included	IB-0800387-A	13JY33
Multichannel High-Speed Counter Module User's Manual	Sold separately	SH080692ENG-A	13JZ03

※For detailed specifications and restrictions of Q02UCPU, QD63P6, and QD72P3C3, refer to the user's manuals of the products.

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