Changes for the Better

MITSUBISHI

Mitsubishi PLC

2002 No.177E

NEW PRODUCT RELEASE

Process CPU (New)

Q12PHCPU, Q25PHCPU

MELSECNET/H Network Module (Version up)

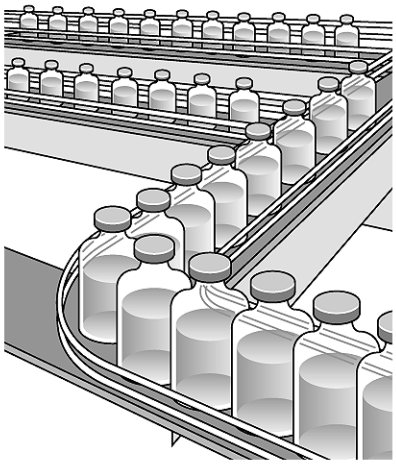
QJ71LP21-25, QJ71LP21G, QJ71LP21GE, QJ71BR11

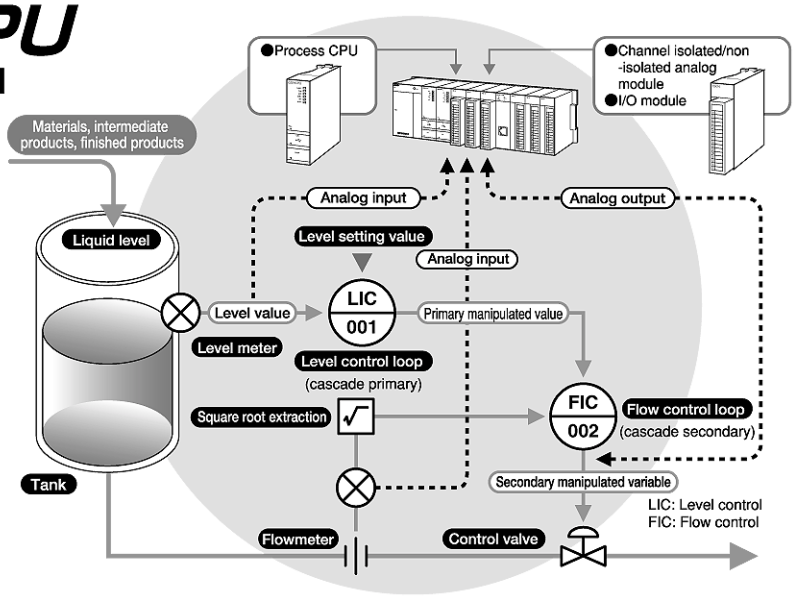
New!

Achieving High Performance Process Control!!

Process CPU

PROCESS CPU





Manages various kinds of loop control/High speed loop control

High-performance analog I/O

Improved reliability and maintenance

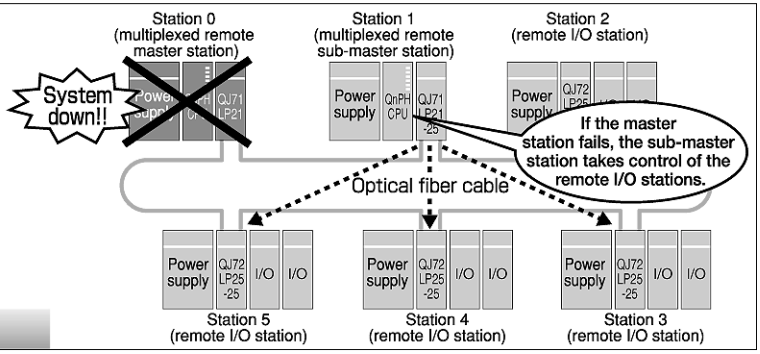
The process CPU is a CPU module for process control systems.
Based on the technology of the High Performance model QCPUs, the process CPU includes the following instructions and functions:
●52 types of process control instructions
●Auto-tuning function ●Online module replacement
●Compatible with MELSECNET/H multiplexed remote I/O systems

Achieving multiplexed remote I/O network with the use of process CPUs!!

MELSECNET/H Network Module

MELSECNET/H Network Module

Quick response to sudden error(s).



Note: The 'multiplexed' remote I/O system is a remote I/O system incorporating the 'redundant control' function.

[Features]

1. Process CPU

(1) High performance process control

(a) Includes the process control instructions (two-degree-of freedom PID, sample PI and auto-tuning) for advanced process control.

(b) High speed processing of PID operation increases the number of control loops.

- These features provide a more economical solution than a conventional DCS system.

(2) Channel isolated high resolution analog module realizes process control for PLC

Includes a wide range of features such as channel isolation, high accuracy, and high resolution, with a variety of alarm and I/O signal error detection functions that increases the scope of process control applications. Please refer to new product release NO.182, for details of analog module.

(3) Improved maintenance and reliability

(a) When the analog module, I/O module or temperature control module fails, it is possible to replace the module online (hot-swap) without stopping or powering off the process CPU (GX Developer is required).

(b) Multiplexed remote I/O network improves the reliability of a remote I/O system.

- MELSEC process control offers more flexible maintenance environment.

Caution

GX Developer Version 7.12N or later is required for the process CPU.

2. MELSECNET/H Network Module

(1) The multiplexed remote I/O network system provides a quick response to sudden error(s).

By utilizing the MELSECNET/H's remote I/O system, a system including a multiplexed remote master station can be configured.

This is achieved by including a master station and sub-master station on the multiplexed remote I/O network. When the multiplexed remote master station fails, the multiplexed remote sub-master station takes control of the remote I/O station(s).

Caution

(a) Only process CPU works as a multiplexed remote master station or multiplexed remote sub-master station.

(b) When using as a multiplexed remote master station or multiplexed remote sub-master station, only an upgraded version network module QJ71LP21-25, QJ71LP21G, QJ71LP21GE or QJ71BR11 is applicable. Please select the product with the first five digits of serial number are "04012" or later.

(c) When using as a remote I/O station, the network module QJ72LP26-25, QJ72LP25G, QJ72LP25GE, and QJ72BR15 does not have to be an upgraded version.

Note: The multiplexed remote master is configured as redundant remote master and the multiplexed sub-master as redundant sub-master respectively.

[Specifications]

1. Process CPU

Item			Specification	
			Q12PHCPU	Q25PHCPU
Control method			Sequence program control method	
I/O control method			Refresh method	
Programming language			Ladder/List/SFC	
Processing speed	Sequence instructions	LD instruction	34 ns	
		MOV instruction	102 ns	
		Floating point addition	782 ns	
		Index modifier	No delay time	
	Process control instructions (processing time of loops)	Basic PID	350 μs	
		Two-degree-of-freedom PID	400 μs	
No. of I/O device points *1			8,192 points	
No. of I/O points *2			4,096 points	
Program capacity	No. of steps		124k steps	252k steps
	No. of programs		124 programs	252 programs *3
Data memory *4	Bit devices		Internal relay M: 8k points Latch relay L: 8k points Step relay S: 8k points Link relay B: 8k points	Edge relay V: 2k points Annunciator F: 2k points Special relay SM: 2k points Special link relay SB: 2k points
	Timers and counters		Timer (low-speed, high-speed) T: 2k points (Low-speed and high-speed measurement units are set by using parameters.) Retentive timer ST: 0 points, Counter C: 1k points	
	Word devices		Data register D: 12k points, Link register W: 8k points, Index register Z: 16 points, Special register SD: 2k points, Special link register SW: 2k points	
Max. file register points (R, ZR)	When internal memory (standard RAM) is used		128k points	
	When memory card is used	SRAM card	1,017k points *6	
		Flash card *5	1,018k points	
Pointers			Pointer P: 4,096 points, Interrupt pointer I: 256 points	
Applicable constants			16-bit integer, 32-bit integer, single precision real number, character string	
Control loop specifications	Process control instructions		52 types	
	No. of control loops		No limit *7	
	Control cycle		Minimum control cycle 10 ms, can be changed for each loop.	
	Main functions		Two-degree-of-freedom PID control, Cascade control, Auto tuning function, Feed forward control	
Communication port			RS-232: 115.2 kbps (maximum), USB: 12 Mbps	
Max. no. of mountable CPU modules in the multiple PLC system			4 CPU modules	
Max. no. of I/O slots			64 slots	
Allowable momentary power failure period			Depending on the power supply module	
5 VDC internal current consumption			0.64 A	
Weight			0.20 kg	

*1: The total number of I/O points on the main and extension base units directly controlled by the CPU module, and I/O points controlled as remote I/Os on the remote I/O network

*2: The number of I/O points on the main and extension base units directly controlled by the CPU module

*3: The process CPU can execute up to 124 programs, but cannot execute 125 or more programs.

*4: The number of data memory device points can be changed within the range of 29k words by using parameters.

*5: It is disabled to write the data into file registers from user application program, when the flash card is working.

*6: Relevant for Q2MEM-2MBS.

*7: There is a restriction on the number of control loops, depending on the combination of the device memory size (when 128 words/loop is used) and the control cycle.

2. MELSECNET/H Network Module

(1) Optical loop system

Item		Specification		
Remote master station		QJ71LP21-25 (Version up)	QJ71LP21G (Version up)	QJ71LP21GE (Version up)
Remote I/O station		QJ72LP25-25	QJ72LP25G	QJ72LP25GE
Max. no. of link points per network	LX/LY	8192 points		
	LB	16384 points		
	LW	16384 points		
Max no. of link points per station		• Remote master station→Remote I/O station ((LY + LB)/8 + (2×LW)) ≦ 1600 bytes*1 • Remote I/O station→Remote master station ((LX + LB)/8 + (2×LW)) ≦ 1600 bytes • Multiplexed remote master station↔multiplexed remote sub-master station ((LY+LB)/8+(2×LW))≦2000 bytes		
Max. no. of I/O points per remote I/O station		X + Y ≦ 4096 points If the X/Y numbers are overlapping, only one side is taken into consideration.		
Communication speed		25 Mbps /10 Mbps / (selected with MODE switch)		10 Mbps
No. of stations connected per network		65 stations (Remote master stations: 1, Remote I/O stations: 64) *2		
Overall distance		30 km		
Distance between stations	25 Mbps	SI optical cable : 200m H-PCF optical cable : 400m Broad-band H-PCF optical cable : 1km QSI optical cable : 1km	—	
	10 Mbps	SI optical cable : 500m H-PCF optical cable : 1km Broad-band H-PCF optical cable : 1km QSI optical cable : 1km	GI-50/125 optical cable : 2km	GI-62.5/125 optical cable : 2km
Network Cable		Optical fiber cable (procured by user)		
Applicable connectors		2-core optical connector plug (procured by user)		
Max. no. of networks		239 (Total including PLC to PLC networks)		
Transmission method		Duplex loop		
Communication method		Token ring		
Synchronization method		Frame synchronization		
Coding method		NRZI code (Non Return to Zero Inverted)		
Transmission format		HDCL standards (Frame format)		
Error control		CRC ($X^{16} + X^{12} + X^5 + 1$) and retry by timeover		
RAS functions		• Loop-back function due to error detection or broken cable • Diagnostic function for checking local link lines • Detection using special relays or registers		
Transient transmission		• 1:1 communication (Monitor, program upload/download, etc.) • Various send/receive commands from the PLC program (READ/WRITE,REMFR/REMTO)		
No. of occupied I/O points		QJ71LP21-25/QJ71LP21G/QJ71LP21GE : 32 points (Intelligent function module: 32 points) QJ72LP25-25/QJ72LP25G/QJ72LP25GE : None (mounted on CPU slot)		
5 VDC internal current consumption		QJ71LP21-25/QJ71LP21G/QJ71LP21GE : 0.55A QJ72LP25-25/QJ72LP25G/QJ72LP25GE : 0.89A		
Weight (kg)		QJ71LP21-25/QJ71LP21G/QJ71LP21GE : 0.11kg QJ72LP25-25/QJ72LP25G/QJ72LP25GE : 0.15kg		

*1: The remote master station includes the multiplexed remote master station and multiplexed remote sub-master station.

*2: On a multiplexed remote I/O network, one of 64 remote I/O stations works as a multiplexed remote sub-master station.

(2) Coaxial bus system

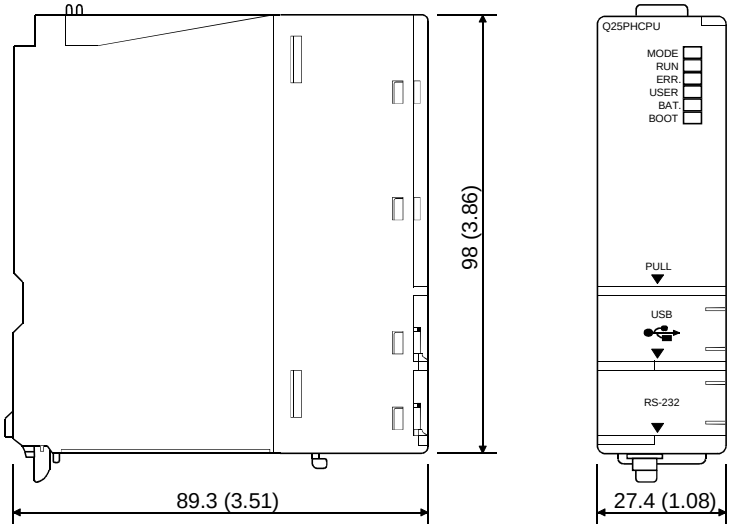
Item		Specification
Remote master station		QJ71BR11 (Version up)
Remote I/O station		QJ72BR15
Max. no. of link points per network	LX/LY	8192 points
	LB	16384 points
	LW	16384 points
Max. no. of link points per station		• Remote Master Station→Remote I/O station ((LY + LB)/8 + (2×LW)) ≦ 1600 bytes*1 • Remote I/O station→Remote Master Station ((LX + LB)/8 + (2×LW)) ≦ 1600 bytes • Multiplexed remote master station↔multiplexed remote sub-master station ((LY + LB)/8 + (2×LW)) ≦ 2000 bytes
Max. no. of I/O points per remote I/O station		X + Y ≦ 4096 points If the X/Y numbers are overlapping, only one side is taken into consideration.
Communication speed		10 Mbps
No. of stations connected per network		33 stations (Remote master stations: 1, Remote I/O stations: 32)*2
Overall distance	3C-2V	300 m (Between stations 300 m)
	5C-2V	500m (Between stations 500 m)
		Can be extended up to 2.5 km with the use of a repeater (ABR10,A6BR10-DC)
Max. no. of networks		239 (Total including PLC to PLC networks)
Transmission path		Single layer bus
Communication method		Token bus
Synchronization method		Frame synchronization
Coding method		Manchester code
Transmission format		HDCL standards (Frame format)
Error control		CRC ($X^{16} + X^{12} + X^5 + 1$) and retry by timeover
RAS functions		• Diagnostic function for checking local link lines • Detection using special relays or registers
Transient transmission		• 1:1 communication (Monitor, program upload/download, etc.) • Various send/receive commands from the PLC program (READ/WRITE,REMFR/REMTO)
No. of occupied I/O points		QJ71LP21-25/QJ71LP21G/QJ71LP21GE : 32 points (Intelligent function module: 32 points) QJ72LP25-25/QJ72LP25G/QJ72LP25GE : None (mounted on CPU slot)
5 VDC internal current consumption		QJ71LP21-25/QJ71LP21G/QJ71LP21GE : 0.75A QJ72LP25-25/QJ72LP25G/QJ72LP25GE : 1.10A
Weight		QJ71LP21-25/QJ71LP21G/QJ71LP21GE : 0.11kg QJ72LP25-25/QJ72LP25G/QJ72LP25GE : 0.16kg

*1: The remote master station includes the multiplexed remote master station and multiplexed remote sub-master station.

*2: On a multiplexed remote I/O network, one of 64 remote I/O stations works as a multiplexed remote sub-master station.

[External Dimensions]

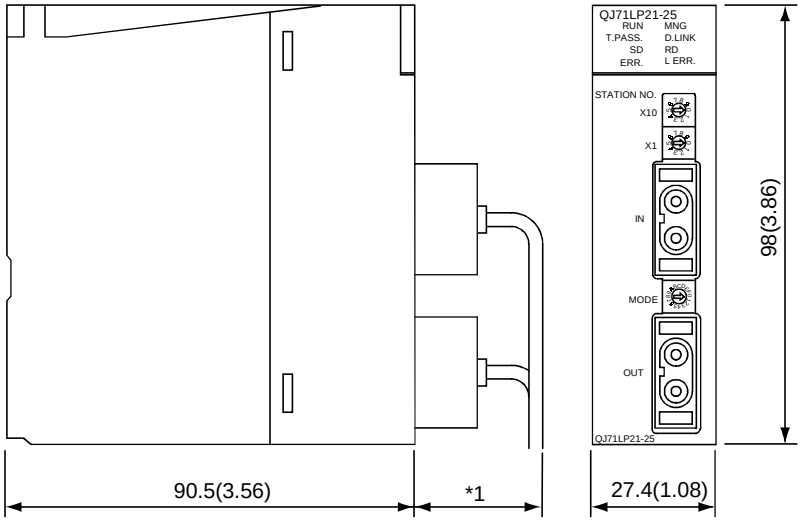
(1) Process CPU



Unit: mm(inch)

(2) MELSECNET/H network module

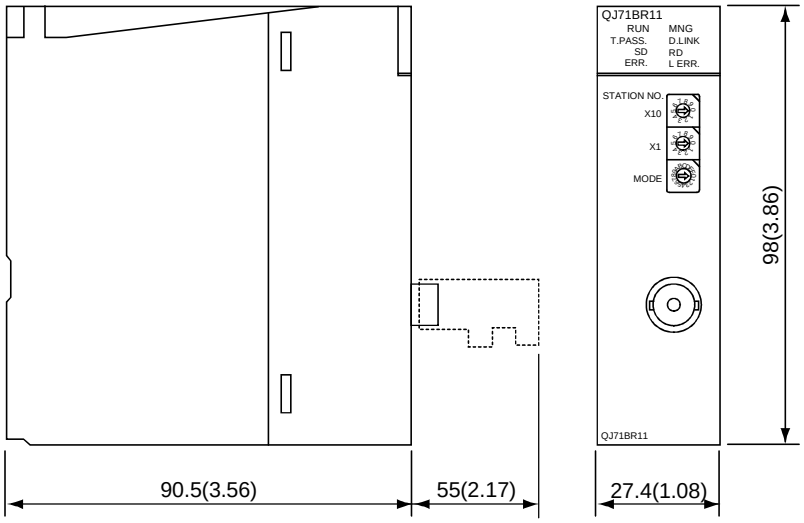
(a) QJ71LP21-25, QJ71LP21G, QJ71LP21GE



Unit: mm(inch)

*1:Please contact your local Mitsubishi service center.

(b) QJ71BR11



Unit: mm(inch)

[Product List]

Product name	Model
Process CPU Module	Q12PHCPU
	Q25HCPU
MELSECNET/H Network Module	QJ71LP21-25
	QJ71LP21G
	QJ71LP21GE
	QJ71BR11

[Manual]

Manual name	Manual supply status	IB/SH No.	Model code
QCPU (Q mode) CPU Module User's Manual (Hardware)	Included with product	IB-0800061-H	13JL96
Process CPU User's Manual (Hardware Design, Maintenance and Inspection)	Sold separately	SH-080314E-A	13JR55
Process CPU User's Manual (Function Explains, Programming Fundamentals)	Sold separately	SH-080315E-A	13JR56
QCPU (Q mode)/ QnACPU Programming Manual (Common instructions)	Sold separately	SH-080039-D	13JF58
QnPHCPU Programming Manual (Process Control Instructions)	Sold separately	SH-080316E-A	13JF67
QCPU (Q mode)/ QnACPU Programming Manual (SFC)	Sold separately	SH-080041	13JF60
QCPU (Q mode)/ QnACPU Programming Manual (MELSAP-L)	Sold separately	SH-080076-C	13JF61
MELSECNET/H Network Module User's Manual (Hardware)	Included with product	IB-0800144-B	13JT16
Q Corresponding MELSECNET/H Network System Reference Manual (Remote I/O network)	Sold separately	SH-080124-C	13JF96

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02 (MEE)
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