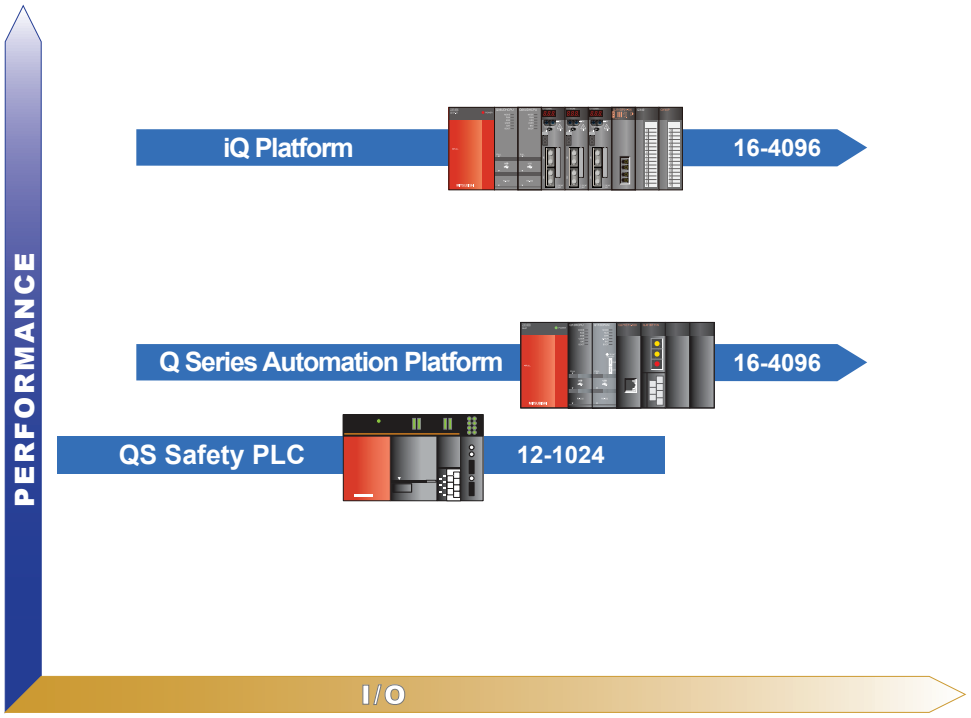
Programmable Automation Controller

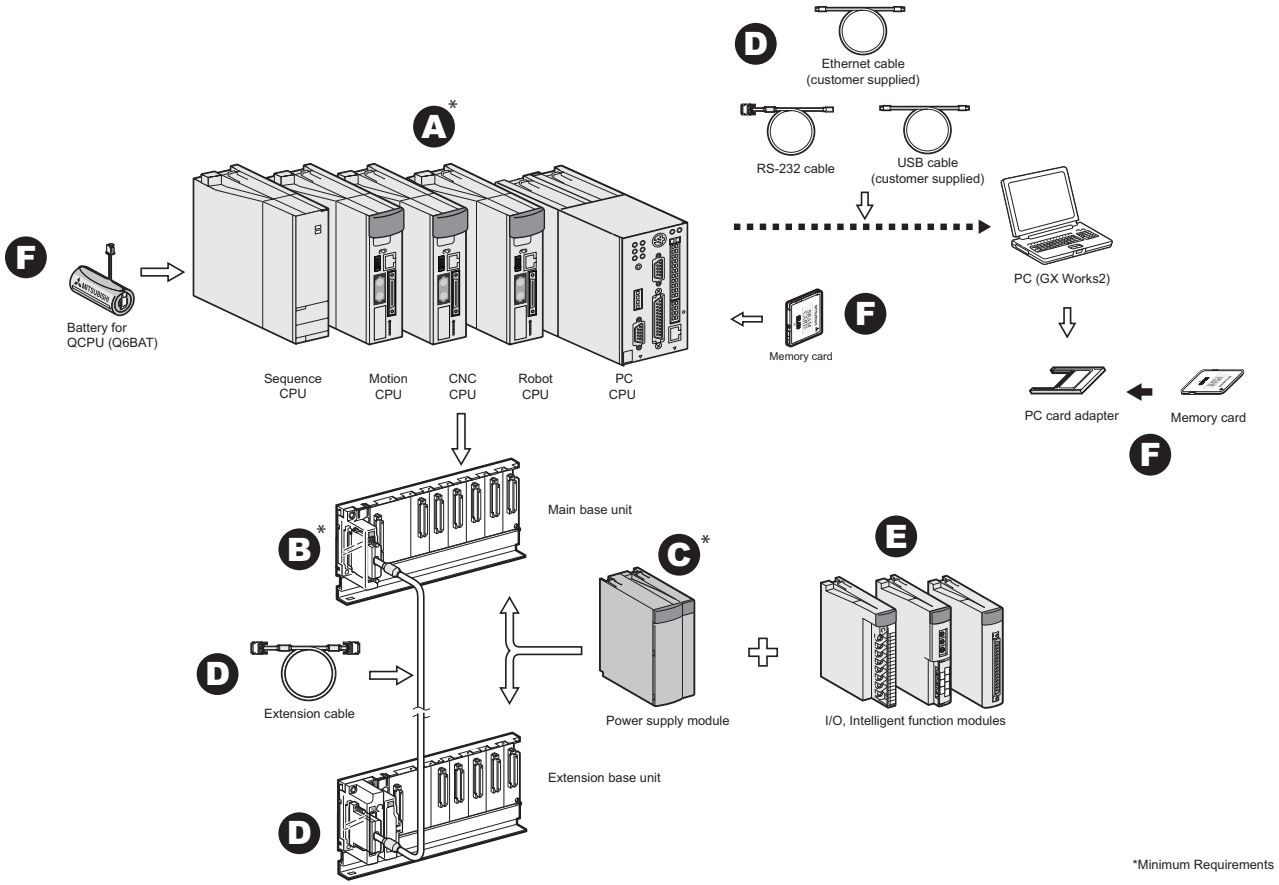


Stock Product: Stock product is product MEAU makes every effort to have on hand for immediate shipment. There may be instances when we are out of stock due to unexpected large requirements. All stock product will be indicated in this book by an "S" in the Stocked Item columns/rows.

Non-Stock Product: Non-stock product is product supplied on an "as-needed" basis. Standard lead times of 12 - 16 weeks apply, product is non-returnable and non-cancelable. Product listed as non-stock may change to stock product subject to increases in sales and usage. All non-stock product will be indicated in this book by a dash "-" in the Stocked Item columns/rows.

iQ Platform

Multiple CPU System Configuration



*Minimum Requirements

The iQ Platform

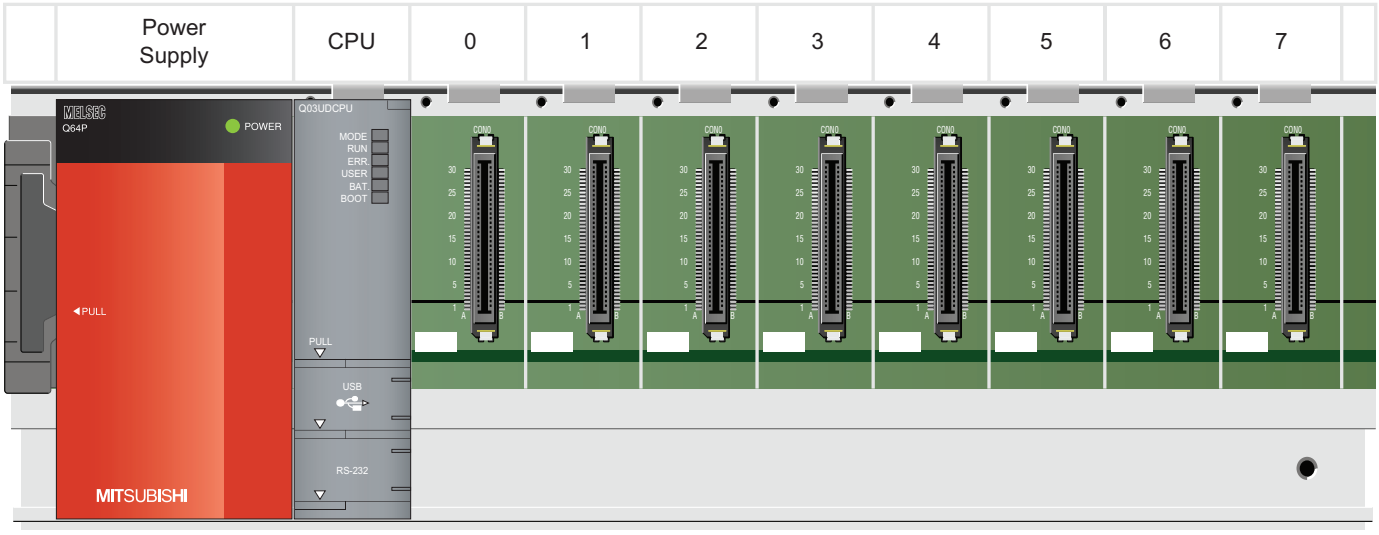
The iQ Platform unifies all of the Mitsubishi Electric automation disciplines into a one-of-a-kind modular Programmable Automation Controller (PAC). Based on the multi-CPU architecture of the renowned Q Series Automation Platform, the iQ ultra high-speed dual-bus back plane allows the iQ to be the only PAC to integrate individual Sequence, Motion, CNC, and Robot control onto a single rack. The iQ Platform is ideal for multi-discipline systems, requiring at least one sequence CPU. Users can expand their configuration with existing Q Series I/O and intelligent modules, providing the iQ Platform customized flexibility without the cost of new development or double-stock.

Key Features:

- Up to 4 CPUs total, including one sequence CPU; Motion, CNC, and Robot CPUs available
- Large 4096 I/O capacity and as low as 9.5ns instruction processing, with selectable CPU program size
- Selectable built-in Ethernet sequence CPUs, enabling program upload/download, monitoring, debugging, SNTP, and FTP functionality via Ethernet
- System configuration and PLC/Motion/HMI programming using iQ Works
- Backward compatibility with Q Series programs and parameters
- Multiple program processing
- Selectable 8 or 32-axis high-speed fiber optic motion controller CPUs
- Selectable 16-axis C70 CNC controller CPU
- Selectable vertical or horizontal type robot controller CPUs
- Infinite I/O and intelligent function module customization possibilities
- Minimal hardware footprint
- Certified by UL, cUL, CE (as indicated), as well as DNV, ABS, RINA, BV, LR and NK shipping approvals for all Q Series products

iQ Platform CPU Configuration

iQ Base Units: Q35DB, Q38DB or Q312DB



1st CPU

QnU Sequence CPU
Q03UD(E)CPU
Q04UD(E)HCPU
Q06UD(E)HCPU
Q10UD(E)HCPU
Q13UD(E)HCPU
Q20UD(E)HCPU
Q26UD(E)HCPU
Q50UDEHCPU
Q100UDEHCPU

2nd – 4th CPU

QnU Sequence CPU; 3 Max.
Q03UD(E)CPU
Q04UD(E)HCPU
Q06UD(E)HCPU
Q10UD(E)HCPU
Q13UD(E)HCPU
Q20UD(E)HCPU
Q26UD(E)HCPU
Q50UDEHCPU
Q100UDEHCPU

QD Motion CPU; 3 Max.
Q172DCPU
Q173DCPU
SQ Robot CPU; 3 Max.
Q172DRCPU
C70 CNC CPU; 2 Max.
Q173NCCPU-S01
C CPU, MES IT, or QPC; 3 Max.
Q12DCCPU-V
QJ71MES96IT
PPC-852

A. iQ Platform CPUs

iQ Platform QnU "Universal" Sequence CPUs

The QnU CPUs bring high-end sequence control to the Mitsubishi PAC lineup and are required in every iQ system. These CPUs are most effective when used in conjunction with other iQ Platform CPUs such as Motion, Robot, CNC, PC and C Language controllers. However, they can also be used in Q Series configurations to increase performance and functionality.

Key Features:

- World-leading processor execution speeds as low as 9.5ns per instruction
- Significantly enhanced arithmetic and data processing (sorting, floating point, etc.)
- Vastly increased data storage and non-volatile program memory
- Utilizes dedicated high-speed CPU-only communication bus with other iQ CPUs
- Backward compatibility with Q Series CPUs, I/O and Intelligent Modules; QnU CPUs can be configured in single-CPU and / or standard Q Series CPUs
- Built-in Ethernet port for increased accessibility and ease-of-use
- USB (Mini-B) connection to CPU for rapid program upload/download

Required Manuals

Model Number	Description	Included with CPU?	Stocked Item
SH(NA)080483	QCPU Users Manual	No	-
SH(NA)080485-ENG	QCPU Users Manual (Multiple CPU Systems)	No	-
SH(NA)080807-ENG	QnUCPU Users Manual	No	-
SH(NA)080809-ENG	QCPU Programming	No	-
SH(NA)080811-ENG	QnUCPU Users Manual (Ethernet Communication)	No	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Model Number			Standard	Q03UDCPU	Q04UDHCPU	Q06UDHCPU	Q10UDHCPU	Q13UDHCPU	Q20UDHCPU	Q26UDHCPU	-	
			Built-In Ethernet	Q03UDECPU	Q04UDEHCPU	Q06UDEHCPU	Q10UDEHCPU	Q13UDEHCPU	Q20UDEHCPU	Q26UDEHCPU	Q50UDEHCPU	Q100UDEHCPU
Stocked Item				S	S	S	-	S	-	S	-	-
Processing Speed (Sequence Instruction)	LD X0			20ns	9.5ns							
	MOV D0 D1			40ns	19ns							
Program Capacity (*1, *2)				30k steps	40k steps	60k steps	100k steps	130k steps	200k steps	260k steps	500k steps	1000k steps
Memory Capacity (*1)	Program Memory (Drive 0)			120k bytes	160k bytes	240k bytes	400k bytes	520k bytes	800k bytes	1040k bytes	2000k bytes	4000k bytes
	Standard RAM (Drive 3)			192k bytes	256k bytes	768k bytes	1024k bytes		1280k bytes		1536k bytes	1792k bytes
	Standard ROM (Drive 4)			1024k bytes			2048k bytes		4096k bytes		8192k bytes	16384k bytes
Max. Number of Files Stored	Program Memory			124			252 (*3)					
	Standard RAM			4 files								
	Standard ROM			256							512	
Memory Card Interface				Yes								
Max. I/O Device Points				8192 points (X/Y0 to 1FFF)								
Max. Physical I/O Points				4096 points (X/Y0 to FFF)								
No. of Device Points				Set in PLC parameters								
File Registers				Available								
Specs. of Built-In Ethernet Port CPU Module (*4)	Data Transmission Speed			100/10Mbps								
	Communication Mode			Full-duplex / Half duplex								
	Ethernet Functions			Program upload/download, remote monitor/maintenance, HMI connection, FTP server, SNTP								
	Max. Distance Between Hub and Node			100m (328.08 feet)								
	Max. No. of Connectable Nodes	10BASE-T		Cascade connection: Four stages maximum								
		100BASE-TX		Cascade connection: Two stages maximum								
	Number of Connections (*5)			16 for MELSOFT connection and MC protocol, 1 for FTP								
Communication Ports				USB (Mini-B), RS-232 / Ethernet							USB (Mini-B), Ethernet	
5VDC Internal Current Consumption				0.33A (*6)	0.39A (*7)						0.50A	
Base Unit Slots Occupied				1								
Weight (kg)				0.20 (0.22 for CPUs with built-in Ethernet ports)							0.24	

Notes:

1. The unit of the file size stored in the memory area varies depending on the CPU module. For more details, refer to the QCPU User's Manual (Function Explanation, Program Fundamentals)
2. The maximum number of executable sequence steps is shown. (Program capacity) - (File header size (default: 34 steps)). For details, refer to the QCPU User's Manual (Function Explanation, Program Fundamentals).
3. The CPU module can only execute up to 124 programs, though more may be stored.
4. Applies to QnU CPUs with built-in Ethernet ports only.
5. Indicates the total number of TCP/IP and UDP/IP protocols.
6. The current value consumption of the built-in Ethernet part version is 0.46A
7. The current consumption of the built-in Ethernet port version is 0.46A.

iQ Platform Motion CPUs

The iQ Platform unifies four key fields of automation, one being servo motion. The iQ Motion CPUs combined with MR-J3 servos deliver the highest level of speed and precision with tight integration to interdisciplinary automation control. Exploiting the high-speed inter-CPU communication bus, servo movement can be scattered seamlessly throughout Sequence, Robot, and CNC operations.

For more details on associated Motion products, please see the Motion Controllers product section.

Key Features:

- Accelerated communication speed over a freely designated expanded range of inter-CPU shared memory
- Additional clutch control functionality
- Faster processing for improved multi-axis support
- Up to 32 axes per CPU, 96 axes per system
- MR-J3-B Servo and SSCNETIII benefits, including noise free, 50Mbps, fiber optic communication, and active auto-tuning

Required Manuals

Model Number	Description	Included with CPU?	Stocked Item
IB(NA)0300133-A	QD Users Manual	No	S
IB(NA)0300134-A	QD Common Manual	No	S
IB(NA)0300136-A	QD Real Mode Manual	No	S
IB(NA)0300137-A	QD Virtual Mode Manual	No	S
IB(NA)0300135-A	QD SFC Programming Manual	No	S

Note: Many of these manuals are available by free download from our website, www.meau.com

Model Number		Q173DCPU	Q172DCPU
Stocked Item		S	S
Number of Control Axes		Up to 32 axes	Up to 8 axes
Operation Cycle (Default)	SV13	0.44ms / 1 to 6 axes; 0.88ms / 7 to 18 axes 1.77ms / 19 to 32 axes	0.44ms / 1 to 6 axes; 0.88ms / 7 to 8 axes
	SV22	0.44ms / 1 to 4 axes; 0.88ms / 5 to 12 axes 1.77ms / 13 to 28 axes; 3.55ms / 29 to 32 axes	0.44ms / 1 to 4 axes; 0.88ms / 5 to 8 axes
Manual Pulse Generator Operation Function		Possible to connect 3 modules	
Synchronous Encoder Operation Function		12 modules max.	8 modules max.
Number of SSCNET III Systems (*1)		2 systems	1 system
Motion Related Interface Module		Q172DLX: 4 modules usable; Q172DEX: 6 modules usable Q173DPX: 4 modules usable (*2)	Q172DLX: 1 module usable; Q172DEX: 4 modules usable Q173DPX: 3 modules usable (*2)
Internal Current Consumption (5VDC) [A]		1.25	1.14
Mass (kg)		0.33	0.33
Base Unit Slots Occupied		1	

Notes:

1. The servo amplifiers for SSCNET cannot be used.
2. When using the incremental synchronous encoder (SV22 use), you can use above number of modules. When connecting the manual pulse generator, you can use only 1 module.

Synchronous Encoder

Type	Synchronous Encoder		Manual Pulse Generator
	Serial Absolute	Incremental	
Model Number	Q172DEX	Q173DPX	
Stocked Item	S	S	
Q173DCPU	12 modules	12 modules	3 modules
Q172DCPU	8 modules	8 modules	3 modules
Base Unit Slots Occupied	1		

iQ Platform CNC CPU

The Q173NCCPU enables entry level CNC Control to be integrated with Sequence, Motion, and Robot automation systems. Also known as the C70 Series CNC Controller, an iQ CNC CPU system uses multi-purpose GOT1000 HMIs and on-rack I/O cards to minimize TCO on CNC line solutions.

For more details on associated CNC products, please see the CNC product section.

Key Features:

- Accelerated communication speed over the inter-CPU shared memory
- Up to 16 axes with 4 simultaneously controlled axes per CPU, 2 CPUs per system
- 16.8k Block/min processing speed
- Streamlined production with reduced Tact Time and host information system linkage
- Uses GOT1000 HMI and iQ rack-based I/O card interfaces
- SSCNETIII benefits, including noise free, 50Mbps, fiber optic communication

Required Manuals

Model Number	Description	Contents	Included with CPU?	Stocked Item
IB1500261	C70 Connection Manual	Covers Q173NCCPU installation and connections	Yes (PDF format)	-
IB1500267	C70 Instruction Manual	Covers screen operation for C70	Yes (PDF format)	-
IB1500263	C70 PLC Interface Manual	Describes the various signal interfaces and functions required when creating sequence program of PLC CPU to operate C70	Yes (PDF format)	-
IB1500269	C70 Programming Manual (Machining Center System)	Covers programming for machining centers	Yes (PDF format)	-
IB1500275	C70 Programming Manual (Lathe System)	Covers programming for lathe systems	Yes (PDF format)	-
IB1500265	C70 Setup Manual	Covers setup	Yes (PDF format)	-
IB1500259	C70 CPU Module Q173NCCPU Specifications Manual	General and functional specifications	Yes (PDF format)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

CNC CPU Specifications	Q173NCCPU-S01	
	Machining Center Type	Lathe Type
Stocked Item	S	S
Number of Control Axes	16	
Maximum Number of Simultaneous Control Axes	4	
Maximum Number of Spindles	7	4
Maximum Number of PLC Axes	7	
Maximum Number of Part Systems	7	3
Control Unit	1µm / 0.1µm	
Interpolation Processing Performance	16.8k Block/min	
Max Feed Rate	1000m/min	
Base Unit Slots Occupied	1	

Note: If used, the Q173SXY CNC Safety I/O module requires programming by GX Developer (unavailable with GX Works2)

iQ Platform Robot CPU

The new Q172DRCPU Robot controller combines faster processing speed and enhanced motion control, providing superior flexibility and performance when designing robotic work cells.

For more details on associated Robot products, please see the Robot product section.

Key Features:

- Capable of controlling up to 3 robots per system
- Base Unit (one slot per CPU)
- Both vertically articulated and SCARA robots can be configured on a single platform
- Single programming software package for all robot types
- Versatility through shared iQ networking, I/O, and intelligent modules
- Improved cycle times through inter-CPU shared memory bus

Vertically Articulated Robots for iQ

Model Number (*1, *2)	Axes / Degrees of Freedom	Max. Payload (kg)	Max. Reach Radius (mm)	Position Repeatability (mm)	Stocked Item
RV-2SQ-_	6	2	504	± .02	-
RV-3SQJ-_	5	3.5	641	± .02	-
RV-3SQ-_	6	3.5	642	± .02	-
RV-6SQ-_	6	6	695	± .02	-
RV-6SQL-_	6	6	902	± .02	-
RV-12SQ-_	6	12	1086	± .05	-
RV-12SQL-_	6	12	1385	± .05	-

Notes:

1. Includes arm, drive unit, CPU, arm to drive unit cable set, and CPU to drive unit cable set.
2. -_ Indicates additional specifications for UL, clean, and oil mist types. Please consult with MEAU.

SCARA Robots for iQ

Model Number (*1, *2)	Axes / Degrees of Freedom	Max. Payload (kg)	Max. Reach Radius (mm)	Z Axis Stroke (mm)	Position Repeatability			Stk Item
					X-Y Composite (mm)	Z (mm)	J4 (deg.)	
RH-3SQHR3515-_	4	3	350	150	± .01	± .01	± .01	-
RH-6SQH3520-_	4	6	350	200	± .02	± .01	± .02	-
RH-6SQH4520-_	4	6	450	200	± .02	± .01	± .02	-
RH-6SQH5520-_	4	6	550	200	± .02	± .01	± .02	-
RH-12SQH5535-_	4	12	550	350	± .02	± .01	± .03	-
RH-12SQH7035-_	4	12	700	350	± .025	± .01	± .03	-
RH-12SQH8535-_	4	12	850	350	± .025	± .01	± .03	-
RH-18SQH8535-_	4	18	850	350	± .025	± .01	± .03	-
RH-20SQH8535-_	4	20	850	350	± .025	± .025	± .025	-
RH-20SQH8545-_	4	20	850	450	± .025	± .025	± .025	-
RH-20SQH10035-_	4	20	1000	350	± .025	± .025	± .025	-
RH-20SQH10045-_	4	20	1000	450	± .025	± .025	± .025	-

Notes:

1. Includes arm, drive unit, CPU, arm to drive unit cable set, and CPU to drive unit cable set.
2. -_ Indicates additional specifications for UL, clean, and oil mist types. Please consult with MEAU

Options for iQ Robots

	Model Number	Description	Notes	Stocked Item
Teach Pendants	R32TB	Standard Teach Pendant, 7m Cable	Basic Teaching and Operation	S
	R32TB-15	Standard Teach Pendant 15m Cable	Basic Teaching and Operation	-
	R56TB	Enhanced Teach Pendant 7m Cable	Advanced Function Pendant	S
	R56TB-15	Enhanced Teach Pendant 15m Cable	Advanced Function Pendant	S
Software	RT-TOOLBOX 2 C1	Robot Programming and Setup SW-Light Version	Without Simulation Tool	S
	RT-TOOLBOX 2 LT-C1	Robot Programming and Setup SW	With Simulation Tool	S
	MELFA-VISION-C1	Vision Interface and Setup SW Tool	Compatible with Cognex “In-Sight” sensors	S
	MELFA-WORKS-C1	Advanced Design and Integration SW Tool	Add on to Solid Works Required	S
Hand Interface Card	2A-RZ365	Pneumatic Hand Interface	Sink Type	S
	2A-RZ375	Pneumatic Hand Interface	Source Type	S
Solenoid Valve Sets (*1)	1E-VD01	1 Valve Set with Connection Cable (Sink)	RV-2	-
	1E-VD01E	1 Valve Set with Connection Cable (Source)	RV-2	S
	1E-VD02	2 Valve Set with Connection Cable (Sink)	RV-2	-
	1E-VD02E	2 Valve Set with Connection Cable (Source)	RV-2	S
	1S-VD0_-02	Valve Set with Connection Cable (Sink)	RV-3, 6	S
	1S-VD0_E-02	Valve Set with Connection Cable (Source)	RV-3, 6	S
	1S-VD0_-01	Valve Set with Connection Cable (Sink)	RV-12	S
	1S-VD0_E-01	Valve Set with Connection Cable (Source)	RV-12	S
	1S-VD0_M-04	Valve Set with Connection Cable (Sink)	RH-6	S
	1S-VD0_ME-04	Valve Set with Connection Cable (Source)	RH-6	S
	1S-VD0_M-03	Valve Set with Connection Cable (Sink)	RH-12, 20	S
	1S-VD0_ME-03	Valve Set with Connection Cable (Source)	RH-12, 20	S
Hand I/O Cables	1E-GR35S	Hand Output Cable	8-Connection, RV-2	S
	1S-HC30C-11	Hand Input Cable	12-Connection, RV-2	S
	1S-GR35S-01	Hand Output Cable	4-Connection, RV-3, 6, 12	S
	1S-HC25C-01	Hand Input Cable	8-Connection, RV-3, 6, 12	S
	1S-GR35S-02	Hand Output Cable	4-Connection, RH	S
	1S-HC35C-02	Hand Input Cable	8-Connection, RH	S
Hand Curl Tube	1N-ST0602C	Φ6 - 1 Connection	RV-12	S
	1N-ST0604C	Φ6 - 2 Connections	RV-12	S
	1N-ST0606C	Φ6 - 3 Connections	RV-12	S
	1N-ST0608C	Φ6 - 4 Connections	RV-12, RH-6, 12, 20	S
	1E-ST0402C	Φ4 - 1 Connection	RV-2, 3, 6	S
	1E-ST0404C	Φ4 - 2 Connections	RV-2, 3	S
	1E-ST0406C	Φ4 - 3 Connections	RV-3, 6	S
	1E-ST0408C	Φ4 - 4 Connections	RV-3, 6	S
	1E-ST0408C-300	Φ4 - 4 Connections, 300 mm	RH-6	S

Note 1: _ = number of valves (1-4)

B. iQ Platform Base Units

The high speed iQ base units utilize a secondary inter-CPU bus to share more data at faster speeds between up to 4 iQ CPUs. Non-iQ CPUs may be used on the base unit, but will not increase in performance.

Base Units

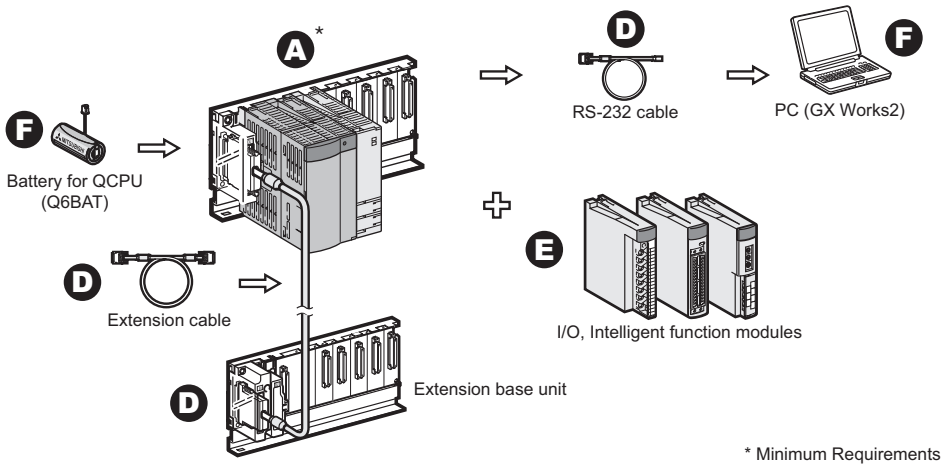
Model Number	Q35DB	Q38DB	Q312DB
Stocked Item	S	S	S
Certification	UL • cUL • CE		
Expansion Slots (Excluding 1st CPU Slot)	5	8	12
Applicable I/O and Intelligent Function Modules	Q Series/iQ modules		
Dimension (W x H) mm (in)	245 x 98 (9.65 x 3.86)	328 x 98 (12.92 x 3.86)	439 x 98 (17.30 x 3.86)
Weight (kg)	0.32	0.41	0.54
Accessories	4- M4 x 14 base unit mounting screws		

DIN Rail Mounting Adapters

Model Number	Applicable Base or Extension Base	Stocked Item
Q6DIN1	Q38DB, Q312DB	S
Q6DIN2	Q35DB	S

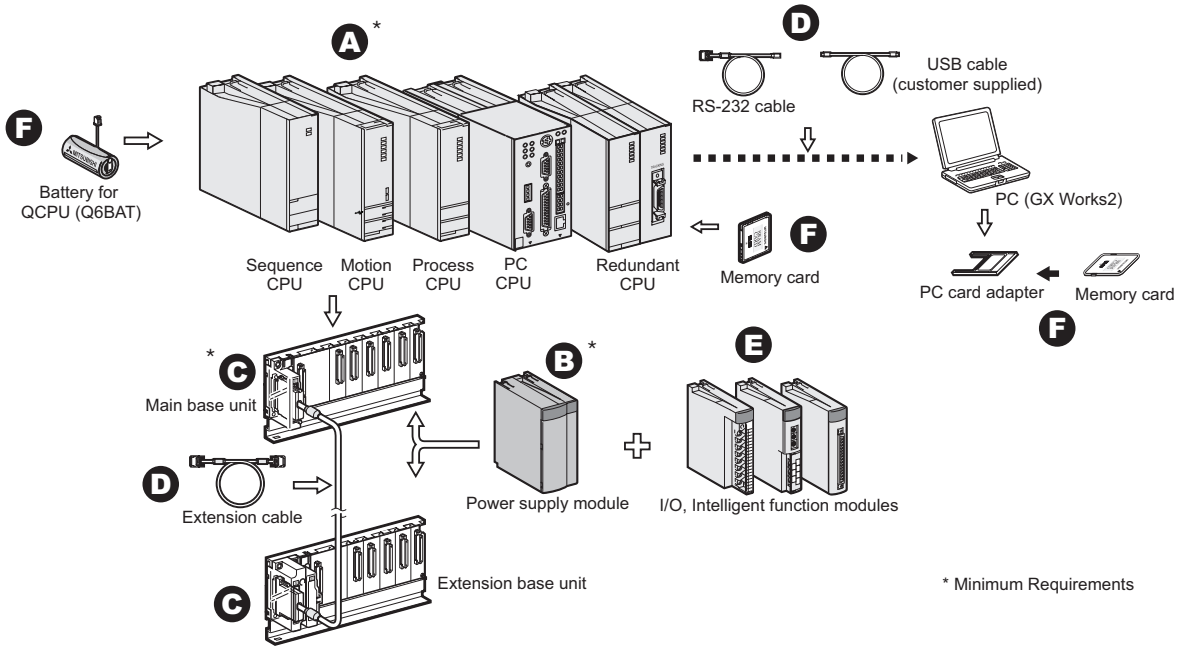
Q Series

Integrated System Configuration (Q00UJCPU/Q00UJCPU-S8)



* Minimum Requirements

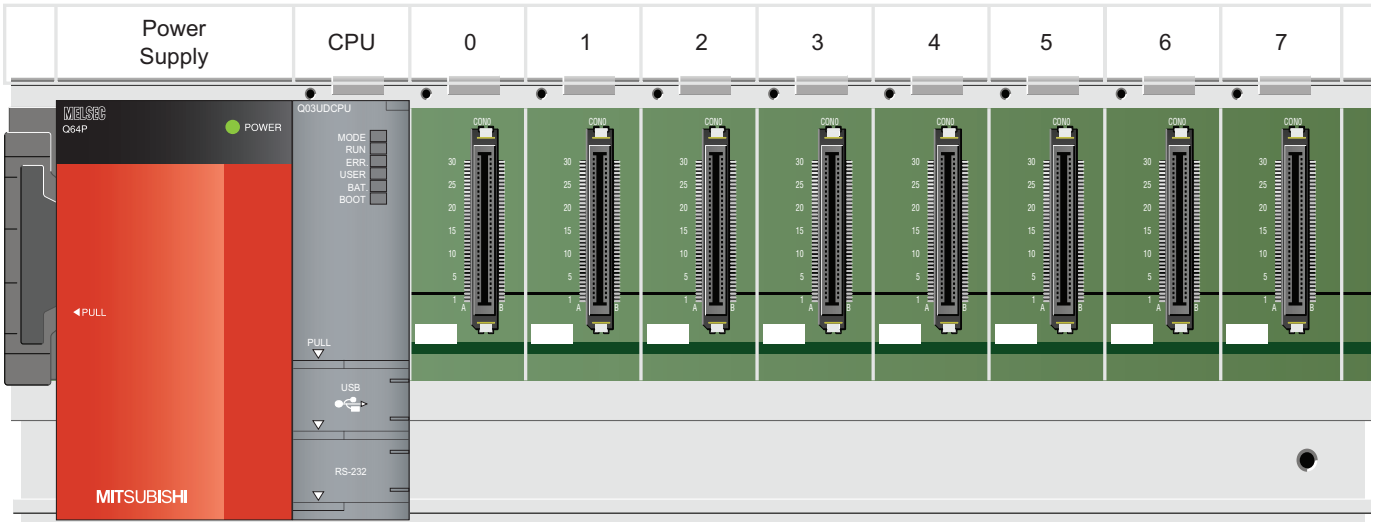
Multiple CPU System Configuration



* Minimum Requirements

Q Series CPU Configuration & Compatibility

Q Series Standard and Slim-type Base Units: Q_B and Q_SB



1st CPU

Integrated Basic Q Sequence CPU
- Q00UJCPU
- Q00UJCPU-S8

Basic Q Sequence CPU
- Q00CPU
- Q01CPU

Basic QnU Sequence CPU
- Q00UCPU
- Q01UCPU
- Q02UCPU

QnH Sequence CPU
- Q02CPU
- Q02HCPU
- Q06HCPU
- Q12HCPU
- Q25HCPU

Process CPU
- Q02PHCPU
- Q06PHCPU
- Q12PHCPU
- Q25PHCPU

QnU Sequence CPU
- Q03UD(E)CPU
- Q04UD(E)HCPU
- Q06UD(E)HCPU
- Q10UD(E)HCPU
- Q13UD(E)HCPU
- Q20UD(E)HCPU
- Q26UD(E)HCPU
- Q50UDEHCPU
- Q100UDEHCPU

2nd – 4th CPU (Dependent on 1st CPU and Base Unit Selected)

QnH Sequence CPU
- Q02CPU
- Q02HCPU
- Q06HCPU
- Q12HCPU
- Q25HCPU

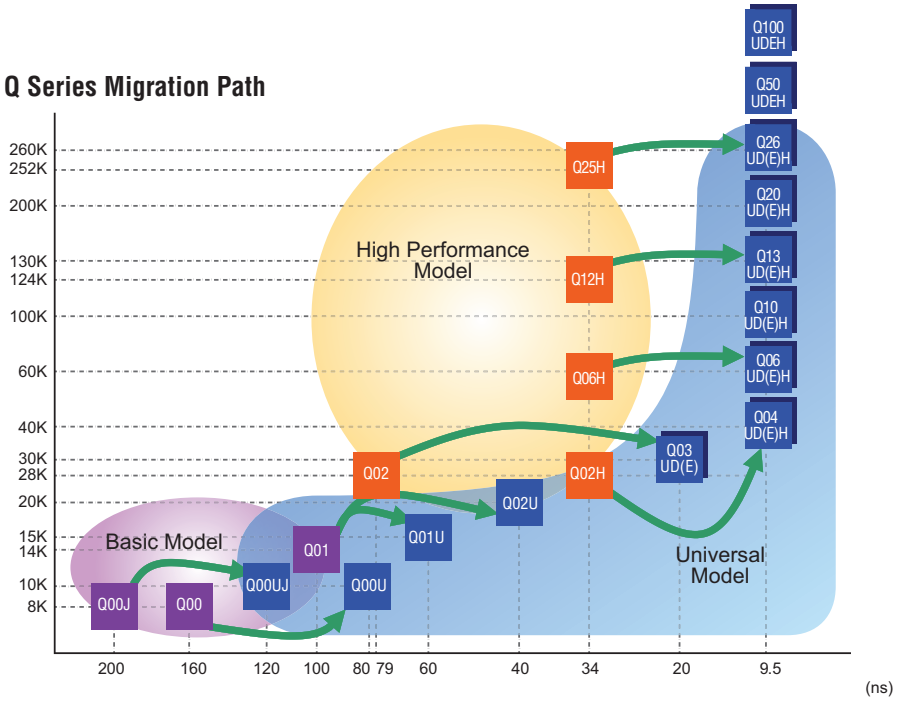
Process CPU
- Q02PHCPU
- Q06PHCPU
- Q12PHCPU
- Q25PHCPU

QnU Sequence CPU
- Q03UD(E)CPU
- Q04UD(E)HCPU
- Q06UD(E)HCPU
- Q10UD(E)HCPU
- Q13UD(E)HCPU
- Q20UD(E)HCPU
- Q26UD(E)HCPU
- Q50UDEHCPU
- Q100UDEHCPU

Q/QH Motion CPU; 3 Max.
- Q172HCPU
- Q173HCPU
- Q172CPUN
- Q173CPUN

C CPU, MES IT, or QPC; 3 Max.
- Q12DCCPU-V
- QJ71MES96IT
- PPC-852

Q Series Migration Path



The MELSEC Q Series Automation Platform

Q Series PACs are multi-disciplinary automation platforms addressing the needs of both OEMs and end users. The Q Series is the original multi-CPU system, with up to 4 CPUs to divide-and-conquer larger applications. It provides scalable automation solutions to both small and very large systems, offering a broad spectrum of automation capabilities. Additional CPUs and intelligent function module expansions allow the Q series to handle sophisticated motion, process control, PC and C language based control, MES IT interfacing, and numerous types of communication and networking.

Key Features:

- CPU types ranging from small/medium systems, to complex networked systems with tens of thousands of I/O
- Reduced lifecycle costs via remote system management and maintenance
- Redundant CPU capability available for hot-backup of critical systems
- Multiple CPU capability (up to 4 CPUs) adding open ended system performance and flexibility
- Multiple programs allowing concurrent development, code reuse, better program organization and faster troubleshooting for less downtime
- Multiple simultaneous access to the system allowing for faster system debugging and maintenance
- Networking & communication options distribute Q Series systems over wide areas while reducing wiring costs
- Sequence CPUs can also address process applications by means of built-in PID capabilities
- Extremely compact package saves panel costs
- Certified by UL, cUL, CE (as indicated), as well as DNV, ABS, RINA, BV, LR and NK shipping approvals for all Q Series products

Required Manuals

Model Number	Description	Contents	Included with CPU?	Stk Item
IB(NA)0800061	QCPU(Q mode) CPU Module User's Manual (Hardware)	General specs, CE compliance information, Installation, safety requirements, Power supply wiring, overview of system parts	No (included with base units)	-
SH(NA)080483	Q CPU (Q Mode) User's Manual (Hardware Design, Maintenance & Inspection)	CPU H/W specs, PSU spec, Base Unit specs, CE compliance information, Maintenance & inspection, Installation, Troubleshooting	No (purchase separately)	-
SH(NA)080484	QCPU(Q Mode) User's Manual (Function Explanation, Program Fundamentals)	CPU specifications, system configuration, programming basics, I/O assignments, memory organization, CPU functions, communication with intelligent function modules, parameters & devices, program up/downloads, overview of multiple program architecture, programming basics, overview of multiple CPU system	No (purchase separately)	-
SH(NA)080485	QCPU User's Manual (Multiple CPU System)	Outline, system configuration, concept for multiple CPU system, communication between CPU modules, processing time of QCPU in multiple CPU system, parameter added for multiple CPU system, precautions for use of AnS Series module, starting up the multiple CPU system	No (purchase separately)	-
SH(NA)080039	QCPU(Q Mode)/QnACPU Programming Manual (Common Instructions)	General Description, Instruction Tables, Configuration of Instructions, How To Read Instructions, Sequence Instructions, Basic Instructions, Application Instructions, Instructions For Data Link, QCPU Instructions, Redundant System Instructions, Error Codes	No (purchase separately)	-
SH(NA)080041	QCPU(Q Mode)/QnACPU Programming Manual (SFC)	General Description, System Configuration, Specifications, SFC Program Configuration, SFC Program Processing Sequence, SFC Program Execution	No (purchase separately)	-
SH(NA)080076	Q CPU (Q Mode) Programming Manual (MELSAP-L)	General Description, System Configuration, Specifications, SFC Program Configuration, SFC Program Processing Sequence, SFC Program Execution	No (purchase separately)	-
SH(NA)080040	QCPU(Q Mode)/QnACPU Programming Manual (PID Control Instructions)	General Description, System Configuration for PID Control, PID Control Specifications, Functions of PID Control, PID Control Procedure, PID Control Instructions, How To Read Explanations For Instructions, Incomplete Derivative PID Control Instructions and Program Examples, Complete Derivative PID Control Instructions and Program Examples	No (purchase separately)	-
SH(NA)080366	Programming Guide Book for Structured Text (ST)	Covers Structured Text programming method	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

A. MELSEC Q Series CPUs

Basic Sequence CPUs

These CPUs offer an economical entry-level version of the Q Series for small scale systems.

Key Features:

- Multiple CPU support; use up to three CPUs to combine sequence, process, motion & PC control on a single system (Version B or later)
- Compatible with Q Series Intelligent Function Utility configuration tools
- Offers full range of Q Series network & communication features, including CC-Link IE 100Mbit Ethernet, MELSECNET/H
- Integrated PSU, CPU and base unit available to simplify system construction with Q00UJCPU/Q00JCPUs
- Built in serial communications via CPU port (using MELSEC Communication (MC) protocol)
- Security functions
- Flash memory for programs & parameters
- Supports floating point, function block, PID and SFC programming (Version B or later)

Integrated Basic Q/QnU Sequence CPUs

Model Number		Q00UJCPU	Q00UJCPU-S8
Stocked Item		S	S
Certification		UL • cUL • CE	UL • cUL • CE
Hardware Format		Combined QnU CPU, PSU and 5-Slot Base Unit	Combined QnU CPU, PSU and 8-Slot Base Unit
Processing Speed (Sequence Instruct)	LD X0	120ns	
	MOV (MOV D0 D1)	240ns	
Program Capacity (*1)		10k steps	
Memory Capacity	Program Memory (Drive 0)	40 kbytes	
	Standard RAM (Drive 3)	0	
	Standard ROM (Drive 4)	256 kbytes	
Max. Number of Files Stored	Program Memory	32	
	Standard ROM	128	
Memory Card Interface		No	
Max. I/O Device Points		8192 points (X/Y0 to 1FFF)	
Max. Physical I/O Points		256 points (X/Y0 to FF)	
Number of Device Points		Set in PLC parameters	
File Registers		Not available	
Permissible Instantaneous Power Failure Time		20ms	
Communication Ports		USB (Mini-B) RS-232	
5VDC Internal Current Consumption (A)		0.37	
Weight (kg)		0.70	
Base Unit Slots Occupied		CPU integrated into base unit	

Note:
1. Maximum actual program size is program capacity-34 steps.

Basic QnU Sequence CPUs

Model Number		Q00UCPU	Q01UCPU	Q02UCPU
Stocked Item		S	S	S
Certification		UL • cUL • CE		
Hardware Format		CPU only		
Processing Speed (Sequence Instruct)	LD X0	80ns	60ns	40ns
	MOV (MOV D0 D1)	160ns	120ns	80ns
Program Capacity (*1)		10k steps	15k steps	20k steps
Memory Capacity	Program Memory (Drive 0)	40 kbyte	60 kbyte	80 kbyte
	Standard RAM (Drive 3)	128 kbyte		
	Standard ROM (Drive 4)	512 kbyte	512 kbyte	512 kbyte
Max. Number of Files Stored	Program Memory	32	32	32
	Standard ROM	256	256	256
Memory Card Interface		No		Yes
Max. I/O Device Points		8192 points (X/Y0 to 1FFF)	8192 points (X/Y0 to 1FFF)	
Max. Physical I/O Points		1024 points (X/Y0 to 3FF) (*2)		2048 points (X/Y0 to 7FF) (*2)
Number of Device Points		Set in PLC parameters		
File Registers		Available		
Communication Ports		USB (Mini-B) RS-232	USB (Mini-B) RS-232	
5VDC Internal Current Consumption (A)		0.33	0.33	0.23
Weight (kg)		0.15	0.15	0.20
Base Unit Slots Occupied		1	1	1

Notes:
1. Maximum actual program size is (program capacity-34 steps).
2. Number of I/O points on the main/extension base directly controlled by the CPU module.

MELSEC Q Series High Performance Sequence CPUs

Key Features

- Multiple CPU support; use up to four CPUs to combine sequence, process, motion & PC control on a single system in any combination
- Multiple program capability; allows up to 124 separate programs, depending on CPU type
- Multiple access to CPUs by several technicians simultaneously
- Very broad range of CPU capabilities
- Very high speed processing capability
- USB (Type B) connection to CPU for rapid upload/ download of programs
- Up to 32MB of data storage by use of removable memory cards
- Supports floating point, PID and SFC programming
- Increased functionality in Version B or later (S/N 07032x)
  - SFC active step comment readout instruction
  - Increased multiple CPU shared memory flexibility
  - 1/1000 second resolution timestamp capability
  - Store sampling trace data in Standard RAM
  - Power supply error detection function

MELSEC Q Series High Performance Sequence CPUs

Model Number		Q02HCPU	Q06HCPU	Q12HCPU	Q25HCPU
Stocked Item		S	S	S	-
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Processing Speed (Sequence Instruc.)	LD (LD X10)	34ns			
	MOV (MOV D0 D1)	102ns			
Program Capacity	Program Memory (Drive 0)	28k steps	60k steps	124k steps	252k steps
Memory Capacity	Program Memory (Drive 0)	112 kbytes	240 kbytes	496 kbytes	1008 kbytes
	Standard RAM (Drive 3)	128 kbyte	128 kbyte	256 kbyte	256 kbyte
	Standard ROM (Drive 4)	112 kbyte	240 kbyte	496 kbyte	1008 kbyte
	CPU Shared Memory	8 kbyte (not latched)			
Max. Number of Files Stored	Program Memory	28	60	124	252
	Standard RAM	3			
	Standard ROM	28	60	124	252
Memory Card Interface		Yes			
Max. I/O Device Points		8192 points (X/Y0 to 1FFF) (*1)			
Max. Physical I/O Points		4096 points (X/Y0 to FFF) (*2)			
Number of Device Points		Set in PLC parameters			
File Registers		Available			
Communication Ports		USB (Type B), RS-232			
5VDC Internal Current Consumption (A)		0.64	0.64	0.64	0.64
Weight (kg)		0.20	0.20	0.20	0.20
Base Unit Slots Occupied		1			

Notes:

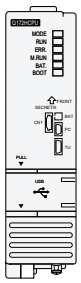
1. Sum of the number of I/O points on the main/extension base directly controlled by the CPU module and the number of I/O points controlled as remote I/O by the remote I/O network.
2. Number of I/O points on the main/extension base directly controlled by the CPU module.

MELSEC QH Motion CPUs

QH Motion CPUs offer the ability to integrate complex motion systems on a Q Series system alongside sequence, process & PC based functions. The motion CPUs allow costly, inflexible mechanical systems to be replaced by multiple axis motion control that is significantly easier and less expensive to design, build and re-configure. QH Motion uses the fiber optic SSCNET III Servo System control network and MR-J3B type amplifiers.

Key Features:

- Up to 32 axes controlled by one CPU, allowing up to 96 axes per base rack
- Servo axes connect quickly and easily via daisy chain connection on SSCNET, eliminating complex, expensive wiring harnesses
- SSCNET offers high speed, deterministic control of each axis independently
- Allows integration with other automation technologies such as open language program control and Ethernet/ Internet capabilities



Required Manuals

Model Number	Description	Contents	Included with CPU?	Stk Item
IB(NA)0300040	Q172CPU(N)/Q173CPU(N) User's Manual	Covers the Q172CPUN and Q173CPUN	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

MELSEC QH Series Motion Controller CPU Modules

Model Number		Q172HCPU	Q173HCPU
Stocked Item		S	S
Certification		UL • cUL • CE	
Number of Control Axes		8 axes	32 axes
Operation Cycle (Default)	SV13	0.44ms / 1 to 3 axes 0.88ms / 4 to 8 axes	0.44ms / 1 to 3 axes 0.88ms / 4 to 10 axes 1.77ms / 11 to 20 axes 3.55ms / 21 to 32 axes
	SV22	0.88ms / 1 to 4 axes 1.77ms / 5 to 8 axes	0.88ms / 1 to 5 axes 1.77ms / 6 to 14 axes 3.55ms / 15 to 28 axes 7.11ms / 29 to 32 axes
Interpolation Functions		Linear interpolation (4 axes max.), circular interpolation (2 axes), Helical interpolation (3 axes)	
Control Modes		PTP (Point to Point) control, Speed control, Speed-position control, Fixed-pitch feed, Constant speed control, Position follow-up control, Speed switching control, High-speed oscillation control, Synchronous control (SV22)	
Programming Tool		IBM PC/AT	
Peripheral I/F		USB / SSCNET III	
Home Position Return Function		Proximity DOG type (2 types), Count type (3 types), Data set type (2 types) DOG cradle type, Stopper type (2 types), Limit switch combined type (Home position return re-try function provided, home position shift function provided)	
Manual Pulse Generator Operation Function		Possible to connect 3 modules	
Synchronous Encoder		Possible to connect 12 modules	Possible to connect 8 modules
Limit Switch Output Function		Number of output points 32 point/axis. Watch data: Motion control data/Word device	
Number of SSCNET II I/F		-	-
Number of SSCNET III Systems		1 systems	2 system
Manual Pulse Generator/ Synchronous Encoder/ Servo External Signals Interface Module		Q172LX: 1 module usable Q172EX: 4 modules usable Q173PX: 3 modules usable (*1)	Q172LX: 4 modules usable Q172EX: 6 modules usable Q173PX: 4 modules usable (*1)
Internal Current		1.14	1.25
Weight (kg)		0.22	0.23
Base Unit Slots Occupied		1	

Note:
1. When using the incremental synchronous encoder by using SV22, you can use 4 modules. When connecting the manual pulse generator, you can use only one module.

MELSEC Q Series Process Control CPUs

These CPUs include a wide variety of process control functions optimized to the task of controlling large scale, complex continuous processes where downtime is not an option. This allows a Q Series system to fully address the needs of users outside of the scope of traditional discrete control applications.

Key Features:

- 52 process control instructions added to standard instruction set
- Floating point math coprocessor dedicated to floating point and process control operations
- Autotuning PID with 2 degrees of freedom (responds to both set value and disturbance)
- Compensation functions to allow loop modeling closer to the actual process
- Process alarm functions related to high, low and deviation process and manipulated variable values
- Tracking functions to allow smooth transfer between manual and automated control
- Hot swappable modules
- Increased functionality in Version C or later (S/N 07032x)
  - SFC active step comment readout instruction
  - Increased multiple CPU shared memory flexibility
  - 1/1000 second resolution timestamp capability
  - Store sampling trace data in Standard RAM
  - Power supply error detection function

Required Manuals

Model Number	Description	Contents	Included with CPU?	Stk Item
SH(NA)080316	QnPHCPU/QnPRHCPU (Process Control Instructions) Programming Manual	Overview, structure & combinations of process control, instructions, data used for process control instructions, how to execute PCI, execution condition switching & functions, instruction list, how to read instruction list, I/O control instructions, control operator instructions, compensation operator instructions, arithmetic operation instructions, comparison operation instructions, auto tuning, error codes, appendices	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Process Control CPUs

Model Number		Q02PHCPU	Q06PHCPU	Q12PHCPU	Q25PHCPU
Stocked Item		S	S	S	-
Programming Language	Sequence Control Dedicated Language	Relay symbol language, logic symbolic language, MELSAP3 (SFC), MELSAP-L, Function block and structured text (ST)			
	Process Control Language	FBD for process control (*1)			
Processing Speed (Sequence Instruction)	LD X0	34ns			
	MOV D0 D1	102ns			
Program Capacity (*2, *3)		28k steps	60k steps	124k steps	252k steps
Memory Capacity Item	Program Memory (Drive 0)	112k bytes	240k bytes	496k bytes	1008k bytes
	Standard RAM (Drive 3)	128k bytes		256k bytes (*4)	
	Standard ROM (Drive 4)	112k byte	240k byte	496k byte	1008k byte
	CPU Shared Memory	8k bytes			
Maximum No. of Stored Files	Program Memory	28	60	124	252 (*5)
	Standard RAM	3 (*6)			
	Standard ROM	28	60	124	252
Memory Card Interface		Yes			
Max. I/O Device Points		8192 points (X/Y0 to 1 FFF)			
Max. Physical I/O Points		4096 points (X/Y0 to FFF)			
Communication Ports		USB (Type-B), RS-232			
5VDC Internal Current Consumption		0.64A			
Weight (kg)		0.20			
Base Unit Slots Occupied		1			

Notes:

1. PX Developer is required for programming by FBD.
2. The unit of the file size stored in the memory area varies depending on the CPU module. For details, refer to the QCPU User's Manual (Function Explanation, Program Fundamentals)
3. The maximum number of executable sequence steps is as shown. (Program capacity) - (File header size (default 34 steps)). Refer to the QCPU User's Manual (Function Explanation, Program Fundamentals)
4. CPU shared memory is not latched.
5. The CPU module can only execute up to 124 programs.
6. Extended by the upgraded functions of the CPU module.

MELSEC Q Series Redundant CPUs

These CPUs take the process control capabilities of the Q Series process CPUs and add full hot-backup capability by using dual redundant CPUs. Use this system in applications where downtime cannot be tolerated for reasons of safety, equipment damage, financial loss, interruption of service, or regulatory compliance.

Key Features:

- Prevent controller downtime with dual redundant CPUs (control and back-up). Any failure of the control CPU causes immediate transfer of control to the back-up, preventing system failure or interruption.
- Synchronize up to 100,000 words of process data between CPUs per scan
- Switchover time typically around 40ms, insuring "bumpless" transfer
- CPUs reside on physically separate racks, allowing control CPU to be replaced while back-up maintains system operation
- Low cost of ownership; most parts are interchangeable with standard Q Series systems
- Redundant power supply option
- Redundant MELSECNET/H control level network provides link to I/O stations at up to 25Mbit/s
- Over 50 process control related instructions (same as Q Process CPUs)
- Most I/O may be hot swapped
- Increased functionality in Version D or later (S/N 07032x)
  - SFC active step comment readout instruction
  - Increased multiple CPU shared memory flexibility
  - 1/1000 second resolution timestamp capability
  - Store sampling trace data in Standard RAM
  - Power supply error detection function

Required Manuals

Use same manual set as shown for Q Series Process CPUs, plus the manual listed below.

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080486	QnPRHCPU User's Manual (Redundant System)	Overview, System Configuration, Tracking cable, Procedure for starting up a redundant system, Redundant system functions, Redundant system networks, Programming cautions, Troubleshooting, Processing time for redundant systems	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Redundant CPUs

Model Number		Q12PRHCPU	Q25PRHCPU
Stocked Item		S	-
Programming Language	Sequence Control Dedicated Language	Relay symbol language, logic symbolic language, MELSAP3 (SFC), MELSAP-L, function block and structured text (ST)	
	Process Control Language	FBD for process control (Programming by PX Developer)	
Processing Speed (Sequence Instruction)	LD X0	34ns	
	MOV D0 D1	102ns	
Processing Speed (Redundant Function)	Tracking Execution Time (Increased Scan Time)	Device memory 48k words: 10ms; Device memory 100k words: 15ms; QnPRHCPU User's Manual (Redundant System)	
Program Size		124 steps	252 steps
Program Memory (Drive 0)		496k bytes	1008K bytes
Memory Size	Standard RAM (Drive 3)	Size of the installed memory card (2M bytes max.)	
	Standard ROM (Drive 4)	496K bytes	1008K bytes
Max. Number of Files Stored	Program Memory	124	252
	Standard ROM	124	252
Max. I/O Device Points (*1)		8192 points (X/Y0 to 1FFF)	
Max. Physical I/O Points (*2)		4096 points (X/Y0 to FFF)	
Max. CPUs Mounted		1 (multiple-CPU configuration is not available)	
Max. Extension Base		0 (All non-redundant modules are mounted on the remote I/O station (the maximum number of modules that can be mounted on a remote station is 64))	
Max. Remote I/O Points		8192 points (up to 2048 points per station)	
Program Capacity	Number of Steps	124 ksteps	252 ksteps
	Number of Programs	124	252 (*3)
Functions Compatible With Redundant System		Redundant configuration of the entire system, including the CPU, the power supply, and the base unit. Hot standby system for the control and standby systems online module change both backup and separate mode available. Large-capacity data tracking: Large-capacity device data transfer (100 kwords) from the control system to the standby system. Network system compatible with redundant system: Switchover in case of MELSECNET/H or Ethernet module malfunction or network wire disconnection.	
Loop Control Specs.	Control Cycle	10 ms -/control loop (Can be set for each loop.)	
	Number of Control Loops	No limit (*4)	
	Main Functions	2-degree-of-freedom PID control, cascade control, automatic tuning function, feed forward control	
RAS	Online Module Replacement	The I/O, analog, temperature input, temperature control, and pulse input modules can be replaced (on a remote I/O station).	
	Output In Case Of Error Stop	Clear or output retention can be designated for each module.	
Communication Ports		USB (Type-B), RS-232	
Modules Mountable On Main Base Unit		Network modules for the Q series can be mounted (Ethernet, MELSECNET/H, and CC-Link only)	
Programming Software		GX Developer, PX Developer	
5VDC Internal Current Consumption		0.89	
Weight		0.30	
Base Unit Slots Occupied		2	

Notes:

1. Total number of the I/O points on the main base unit, which are directly controlled from the CPU module, and the I/O points controlled as remote I/O by the remote I/O network.
2. The number of I/O points on the main base unit, which are directly controlled from the CPU module.
3. The max. number of files that can be executed is 124. Two SFC/MELSAP-Ls are available, one of which is a program execution control SFC.
4. The number of control loops is restricted by the combination of the device memory capacity (128 kwords/loop used) and the control cycle.

Q Redundant CPU Parts

Product Name	Model	Overview	Stock Item
Redundant CPU Module	Q12PRHCPU	Max. I/O device points: 8192 (physical I/O points: 4096), program capacity: 124 ksteps	S
	Q25PRHCPU	Max. I/O device points: 8192 (physical I/O points: 4096), program capacity: 252 ksteps	-
Tracking Cable	QC10TR	1m cable for tracking	S
	QC30TR	3m cable for tracking	-
Base Unit For Redundant Power Supply Systems	Q38RB	Q series I/O mounting main base: Number of power supply slots: 2, number of CPU slots: 1, number of I/O slots: 8	S
	Q68RB	Q series I/O mounting extension base: Number of power supply slots: 2, number of I/O slots: 8	-
	Q65WRB	Q series I/O mounting extension base: Dual Q Bus Inputs, Number of power supply slots: 2, number of I/O slots: 5	S
Power Supply Module For Redundant Power Supply Systems	Q64RP	100 to 120/200 to 240VAC input, 5VDC, 8.5 A output	-

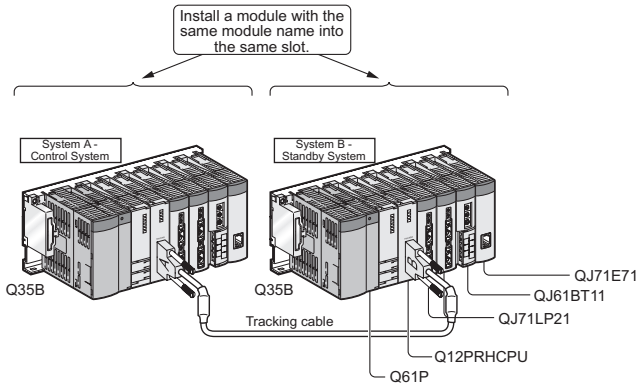
Communication and Networking Module Version Information For Compatibility With Redundant Systems

Product Name	Model Number	Overview	Version	Stock Item
MELSECNET/H Master Module	QJ71LP21-25	For MELSECNET/H dual optical loop interface module (compatible with SI and QSI) control / normal / master stations	Function version "D" or later	S
	QJ71LP21S-25	For MELSECNET/H dual optical loop interface module (compatible with SI and QSI) control / normal / master stations, equipped with an external power supply		-
	QJ71LP21GE	For MELSECNET/H dual optical loop interface module (compatible with GI) control / normal / master stations		-
	QJ71BR11	For MELSECNET/H coaxial single bus interface module control / normal / master stations		S
MELSECNET/H Remote I/O Module	QJ72LP25-25	For MELSECNET/H dual optical loop interface module (compatible with SI and QSI) remote I/O stations (*1)		S
	QJ72LP25GE	For MELSECNET/H dual optical loop interface module (compatible with GI) remote I/O stations		-
	QJ72BR15	For MELSECNET/H coaxial single bus interface module remote I/O stations		S
Ethernet Interface Module	QJ71E71-B2	Ethernet interface module (10BASE2)		-
	QJ71E71-B5	Ethernet interface module (10BASE5)		-
	QJ71E71-100	Ethernet interface module (100BASE-TX/10BASE-T)		S
MELSECNET / H Board For Personal Computers	Q81BD-J71LP21-25	For dual optical loop interface board (compatible with SI and QSI) control / normal stations (*1)		-
	Q80BD-J71LP21G	For dual optical loop interface board (compatible with GI) control / normal stations (*1)		-
	Q81BD-J71BR11	For coaxial single bus interface board control / normal stations (*1)		S
CC-Link IE Control	QJ71GP21-SX	For CC-Link IE Control, dual-loop fiber control stations		S
	QJ71GP21S-SX	For CC-Link IE Control, dual-loop fiber with redundant power control stations		-

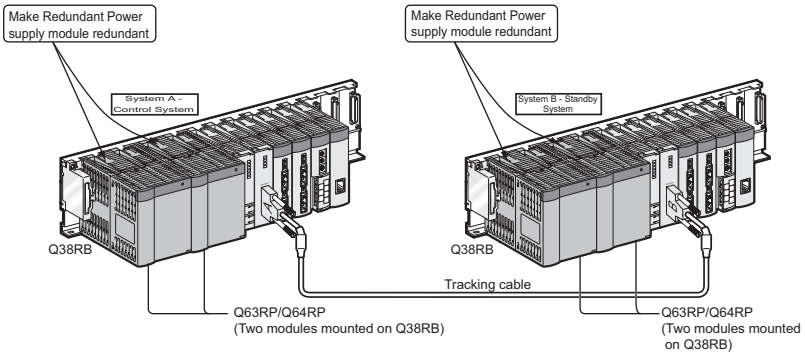
Note:
1. The boards must be used in combination with the attached driver package SW0DNC-MNETH-B[90K] or later version.

Sample Configurations

Non-redundant power supply configuration



Redundant power supply configuration



C Language CPU

The C Language CPU can be added to an iQ Platform or Q Series configuration and allows experienced C programmers to create custom control programs using VxWorks (sold separately). This product is only meant for the advanced user. The Q12DCCPU-V is the hardware base for the MES Interface IT e-F@ctory solution, and is included within the QJ71MES96IT Model Number. It is also the hardware base for the iQ Platform's Ethernet/IP scanner, EIP4CCPU.

Model Number		Q12DCCPU-V
Stocked Item		S
Certification		UL • cUL • CE
Endian Format (Memory Layout)		Little endian
User File Capacity (For User File Storage	Standard RAM	3M bytes
	CompactFlash Card	Up to 8G bytes
Work RAM (for OS, Driver, User Program Execution)		128M bytes
Battery Backed-up RAM		128K bytes
Software	Operating System (*1)	VxWorks Version 6.4
	Programming Language	C language (C/C++)
Ethernet 10BASE-T/ 100BASE-TX	Number of Channels	2 channels (same specification for CH1 and CH2)
	Interface (*2)	10BASE-T/100BASE-TX
	Number of Cascaded Stages	Up to 4 (10BASE-T)/Up to 2 (100BASE-TX)
	Maximum Segment Length (Distance Between Hub and Node)	100m (328.08 feet)
	Supported Function	Auto negotiation function (automatically recognizes 10BASE-T or 100BASE-TX); Auto-MDIX function (automatically recognizes straight or crossing cable)
RS-232	Transmission Speed	9600, 14400, 19200, 28800, 38400, 57600, 115200 bps
	Transmission Distance	Up to 15m (49.21 feet)
	Recommended Cable	7/0.127_P HRV-SV outside diameter: 8.5mm (0.33 inches) or larger (Oki Electric Cable Company, Limited Specify the number of pairs in_.)
	Connector Applicable to External Wiring	Round connector (10-pin)
USB	Transmission Speed	12Mbps (Full Speed Mode: FS)
	Connector	Mini-B
	Other Electric Characteristics	USB 2.0
CompactFlash Card	Supply Power Voltage	3.3V ±5%
	Supply Power Capacity	Up to 150mA
	Card Size	TYPE I card TYPE II card is not allowed. I/O cards, such as a modem card are not allowed.
	Number of Card Slots	1
Number of I/O Points (Number of Points Accessible to Actual I/O Modules)		4096 points (X/Y 0 to FFF)
5VDC Internal Current Consumption		0.93A
Weight (kg)		0.24
Base Unit Slots Occupied		1

Notes:

1. For the development environment (personal computer), refer to the following manual. C Controller Module User's Manual (Utility Operation, Programming)
2. The C Controller module differentiates 10BASE-T and 100BASE-TX according to the target device.

B. MELSEC Q Series Base Units

The base unit (sometimes called a base rack) is the foundation of Q Series systems. All CPU modules are installed on it, along with a power supply, I/O and special function modules. Besides providing physical support to the component modules, the base unit enables communication and power distribution between modules. The base unit can either be directly bolted to a panel, or mounted via DIN rail. In the case of DIN rail mounting, the DIN rail Adapters must be used. Base units accommodate between 3 & 12 modules. For systems that require more modules than be accommodated on the base unit, an extension base unit is required. These connect to the base unit via extension cables.

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800061	QCPU(Q mode) CPU Module User's Manual (Hardware)	• General specs • CE compliance information • Installation • Safety requirements • Power supply wiring • Overview of system parts	No (included with base units)	-
SH(NA)080483	QCPU (Q Mode) User's Manual (Hardware Design, Maintenance & Inspection)	• PSU specs • CPU H/W specs • Base Unit specs • Memory Card specs • CE compliance information • Installation • Maintenance & inspection • Troubleshooting	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Base Units

Model Number	Q33B	Q35B	Q38B	Q38RB	Q312B
Stocked Item	S	S	S	-	S
Certification	UL • cUL • CE				
Number of Expansion Slots (Excluding 1st CPU Slot)	3	5	8	8	12
Applicable I/O and Intelligent Function Modules	Q Series/iQ Platform				
Redundant Power Supply Slot	No	No	No	Yes	No
Dimension (W x H) mm (in)	189 x 98 (7.45 x 3.86)	245 x 98 (9.65 x 3.86)	328 x 98 (12.92 x 3.86)	439 x 98 (17.30 x 3.86)	
Weight (kg)	0.21	0.27	0.36	0.47	0.47
Accessories	4- M4 x 14 base unit mounting screws				

MELSEC Q Series / iQ DIN Rail Adapters

Use these Adapters in situations where mounting of a base or extension unit on a DIN rail is required.
Note: DIN rail mounting is not recommended in locations where high vibration or mechanical shock exists.

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080483	QCPU (Q Mode) User's Manual (Hardware Design, Maintenance & Inspection)	• CPU H/W specs • PSU specs • Base Unit specs • Memory Card specs • CE compliance information • Installation • Maintenance & inspection • Troubleshooting	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

DIN Rail Mounting Adapters

Type	Applicable Base or Extension Base	Stocked Item
Q6DIN1	Q38B, Q312B, Q68B, Q612B	S
Q6DIN2	Q35B, Q65B, Q00JCPU-S8, Q00UJCPU	S
Q6DIN3	Q33B, Q52B, Q55B, Q63B	-

C. MELSEC Q Series / iQ Power Supply Modules

Power supply modules always fit on the left hand end of a rack. All base racks (Q3_B) must include a power supply, as do powered extension racks (Q6_(R)B). We offer PSU to address worldwide AC voltage standards and DC power.

Model Number		Q61P	Q61P-D	Q62P	Q63P	Q64PN	Q63RP	Q64RP
Stocked Item		S	-	S	S	S	-	-
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	-	-
Applicable Base Units		Q3_DB, Q3_B, Q6_B					Q3_RB, Q6_RB	
Input Power Supply		100-240VAC +10%/-15%		100-240VAC +10%/-15%	24VDC +10%/-15%	100-240VAC (+10%/-15%)	24VDC +30%/-35%	100 to 120VAC/ 200 to 240VAC (+10%/ -15%)
Input Frequency		50/60Hz ±3Hz			-	50/60 Hz ±5%	50/60 Hz ±5%	50/60 Hz ±5%
Input Voltage Distortion Factor		5% or less			-	Within 5%	Within 5%	Within 5%
Max. Input Apparent Power		105VA			-	160 VA	65W	160VA
Inrush Current		20A within 8ms			100A within 1ms	20A within 8 ms	150A within 1ms	20A within 8ms
Rated Output Current	5VDC	6A		3A	6A	8.5A	8.5A	8.5A
	24VDC	-		0.6A	-	-	-	-
External Output Voltage		-		24VDC ±10%	-	-	-	-
Permissible Instantaneous Power Failure Time		Within 20ms		Within 20ms	Within 10ms	Within 20ms	Within 10ms	Within 20ms
Operation Indication		LED indication (lit at 5VDC output)	LED indication and power light	LED indication (lit at 5VDC output)			LED indication (Normal operation: ON (green) Error: OFF (red))	
Weight (kg)		0.31		0.39	0.33	0.40	0.60	0.47
Base Unit PSU Slots Occupied		1					2	

D. MELSEC Q Series / iQ Extension Base Units and Connection Cables

Use extension base units (also known as extension racks) in systems that require more modules than can be accommodated on the main base unit. Extension base units are available with a slot for an additional power supply (Q6_B) or without (Q5_B). Use Q6_B extension bases in systems where the current supplied by the base unit power supply is insufficient for the whole system. Up to 7 extension base units may be connected to the base unit, allowing a total of 8 bases. The 8 base units may be extended over a distance of up to 13.2 m (43.28 ft). The maximum number of installed modules is 64. If your system requires more modules or greater distances, consider using a network to link the system together. See the network section for more details.

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800061	QCPU (Q mode) CPU Module User's Manual (Hardware)	• General specs • CE compliance information • Installation • Safety requirements • Power supply wiring • Overview of system parts	No (included with base units)	-
SH(NA)080483	QCPU (Q Mode) User's Manual (Hardware Design, Maintenance & Inspection)	• CPU H/W • PSU specs • Base Unit specs • Memory Card specs • CE compliance information • Installation • Maintenance & inspection • Troubleshooting	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Extension Base Units

Model Number	Q52B	Q55B	Q63B	Q65B	Q68B	Q68RB	Q612B	Q65WRB (*1)
Stocked Item	S	S	-	S	S	-	S	S
Certification	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Number of Expansion Slots	2	5	3	5	8	8	12	5
Power Supply Module Slot	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Redundant Power Supply Slot	No	No	No	No	No	Yes	No	Yes
Dimensions (W x H) mm (in)	106 x 98 (4.18 x 3.86)	189 x 98 (7.45 x 3.86)	189 x 98 (7.45 x 3.86)	245 x 98 (9.65 x 3.86)	328 x 98 (12.92 x 3.86)	439 x 98 (17.30 x 3.86)	439 x 98 (17.30 x 3.86)	439 x 98 (17.30 x 3.86)
Weight (kg)	0.14	0.23	0.23	0.28	0.38	0.49	0.48	0.52

Note:

1. The Q65WRB has dual Q Bus inputs for Local Extension I/O support in Redundant Systems.

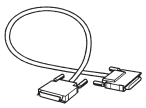
MELSEC Q Series / iQ Extension Cables for Extension Base Units

These cables are used to link main base units to extension base units.
They are available in a variety of lengths from 0.45m (1.48 ft.) to 10m (32.8 ft.).

Model Number	QC05B	QC06B	QC12B	QC30B	QC50B	QC100B
Stocked Item	S	S	S	S	S	S
Certifications	CE	CE	CE	CE	CE	CE
Cable Length (m (ft))	0.45 (1.48)	0.6 (1.97)	1.2 (3.93)	3 (9.84)	5 (16.39)	10 (32.79)
Weight (kg)	0.15	0.16	0.22	0.40	0.60	1.11

Required Manuals: Same as Base Units listed on previous page.

MELSEC Q Series Tracking Cable for QnPRH System



These cables are used to link redundant QnPRH CPU systems to insure data and programs are always synchronized between the two processors.

Model Number	QC10TR	QC30TR
Stocked Item	S	-
Cable Length m (ft)	1.0 (3.29)	3.0 (9.87)
Weight (kg)	0.15	0.28

Required Manuals: Same as Base Units listed on previous page.

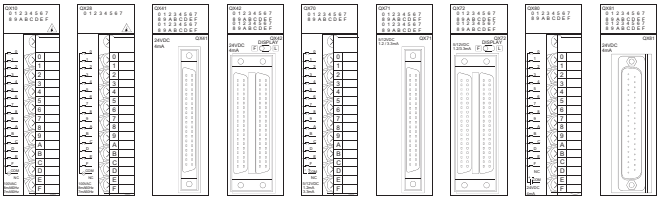
MELSEC Q Series / iQ RS-232 Communication Cable

Model Number	SC-Q
Stocked Item	S
Cable Length m (ft)	3 (9.84)
Connection Type	RS-232 Connection: 9 pin DSUB to Q Series front port connection

***Note** Also compatible with ST Series I/O head station (see Distributed I/O section of this guide.)

E. MELSEC Q Series / iQ Digital Input Modules

Digital input modules provide the CPU interface for monitoring on/off voltage signals in your system.



Key Features:

- Sense commonly used AC and DC voltages
- Negative/positive common types
- 16, 32 or 64 inputs per module, depending on module type.
- 1-70ms software selectable input filter response time (via GX Works2) for adjusting input response. This avoids the effects of noise on the inputs
- DC input short circuit protection
- Internal optoisolation
- Removable terminal blocks
- Established A Series connectors (FCN/D-sub type) on 32 & 64 I/O modules for compatibility with existing A Series terminal block (A6TBXY type) installations

If you need to monitor varying signal levels of voltage or current, please refer to the analog input modules section. If you need to monitor digital signals that change their state rapidly (more than approximately 10 Hz, depending on program scan time), then consider using high-speed counter modules.

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080042	I/O Module Type Building Block User's Manual	Specifications & wiring diagrams for all Q Series digital I/O modules	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Q Series / iQ Input Modules

Model Number		QX10	QX28	QX40	QX40-S1	QX40H	QX41	QX41-S1
Stocked Item		S	-	S	S	-	S	-
Certification		UL • cUL • CE						
Input Type		AC	AC	DC positive common (sink)				
No. of Input Points		16	8	16	16	16	32	32
Input Voltage		100-120VAC +10%/-15%, 50/60Hz ±3Hz	100-240VAC +10%/-15%, 50/60Hz ±3Hz	24VDC +20%/-15%		24VDC +20%/ -15%, ripple ratio: within 5%	24VDC +20%/-15%	
Input Current (mA)		8	17 (@200 VAC/60Hz)/ 14 (@200 80@100 VAC/60Hz)/ VAC/50Hz) 7 (100 VAC/50Hz)	4	6		4	
Response Time (ms)	OFF-ON	15@100VAC, 50/60Hz	10@100VAC, 50/60Hz	1/5/10/20/70 (*1)	0.1/0.2/0.4/0.6/1 (*1)	.04/.10/.25/ .50/.95 (*1)	1/5/10/20/70 (*1)	0.1/0.2/0.4/0.6/1 (*1)
	ON-OFF	20@100VAC, 50/60Hz	20@100VAC, 50/60Hz	1/5/10/20/70 (*1)	0.1/0.2/0.4/0.6/1 (*1)	.04/.10/.25/ .50/.95 (*1)	1/5/10/20/70 (*1)	0.1/0.2/0.4/0.6/1 (*1)
Connection Type		Screw Terminals	Screw Terminals	Screw Terminals	Screw Terminals	Crimping Terminal	FCN x 1 (*2)	FCN x 1 (*2)
Points/Common		16	8	16	16	8	32	32
Maximum 5VDC Current Consumption (mA)		50	50	50	60	80	75	75
Weight (kg)		0.17	0.2	0.16	0.2	0.16	0.15	0.15
Base Unit Slots Occupied		1						

Notes: See notes next page.

Model Number		QX41-S2	QX42	QX42-S1	QX70	QX70H	QX71	QX72
Stocked Item		-	S	S	S	S	S	-
Certification		UL • cUL • CE						
Input Type		DC positive common (sink)			DC positive/ negative common (sink/source)	DC positive/ common (sink)	DC positive/negative common (sink/ source)	
No. of Input Points		32	64	64	16	16	32	64
Input Voltage		24VDC +20%/-15%			5/12VDC +20%/-15%	5VDC +20%/-15%	5/12VDC +20%/-15%	
Input Current (mA)		6	4	4	1.2 / 3.3	3	1.2 / 3.3	1.2 / 3.3
Response Time (ms)	OFF-ON	1/5/10/20/70 (*1)	1/5/10/20/70 (*1)	0.1/0.2/0.4/0.6/1 (*1)	1/5/10/20/70 (*1)	.04/.10/.25/ .50/.95 (*1)	1/5/10/20/70 (*1)	
	ON-OFF	1/5/10/20/70 (*1)	1/5/10/20/70 (*1)	0.1/0.2/0.4/0.6/1 (*1)	1/5/10/20/70 (*1)	.04/.10/.25/ .50/.95 (*1)	1/5/10/20/70 (* 1)	
Connection Type		FCN x 2 (*2)	FCN x 2 (*2)	FCN x 2 (*2)	Screw Terminals	Crimping Terminal	FCN x 1 (*2)	FCN x 2 (*2)
Points/Common		32	32	32	16	8	32	32
Maximum 5VDC Current Consumption (mA)		75	90	90	55	80	70	85
Weight (kg)		0.15	0.18	0.18	0.14	0.14	0.12	0.13
Base Unit Slots Occupied		1						

Notes: See notes next page.

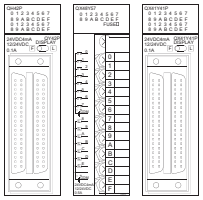
MELSEC Q Series / iQ Input Modules (Continued)

Model Number		QX80	QX80H	QX81	QX81-S2	QX82	QX82-S1	QX90H
Stocked Item		S	S	S	-	S	-	S
Certification		UL • cUL • CE						
Input Type		DC negative common (source)						
No. of Input Points		16	16	32	32	64	64	16
Input Voltage		24VDC +20%/-15%	24VDC +20%/-15%	24VDC +20%/-15%	24VDC (+20/-15%, ripple ratio within 5%)	24VDC +20%/-15%	24VDC +20%/-15%	5VDC +20%/-15%
Input Current (mA)		4	6	4	6	4	4	6
Response Time (ms)	OFF-ON	1/5/10/20/70 (*1)	.04/.10/.25/.50/.95 (*1)	1/5/10/20/70 (*1)			.05/.15/.3/.55/1.05 (*1)	.04/.10/.25/.50/.95 (*1)
	ON-OFF	1/5/10/20/70 (*1)	.04/.10/.25 /.50/.95 (*1)	1/5/10/20/70 (*1)			.15/.2/.35/.6/1.1 (*1)	.04/.10/.25 /.50/.95 (*1)
Minimum On Voltage/ Current		19VDC/3mA	13V or higher/3mA	19VDC/3mA	15VDC/3mA	19VDC/3mA	19VDC/3mA	3.5V or higher/3mA
Maximum Off Voltage/ Current		11VDC/ 1.7mA	8V or lower/1.6mA	11VDC/ 1.7mA	5VDC/ 1.7mA	11VDC/ 1.7mA	9.5VDC/1.5mA	1V or lower/1mA
Connection Type		Screw Terminals	Crimping Terminal	D-Sub (*3)	D-Sub	FCN x 2 (*2)	FCN x 2 (*2)	Crimping Terminal
Points/Common		16	8	32	32	32	32	8
Maximum 5VDC Current Consumption (mA)		50	80	75	75	90	90	80
Weight (kg)		0.16	0.16	0.16	0.16	0.18	0.18	0.14
Base Unit Slots Occupied		1						

Notes:
1. Set response time by parameters in GX Works2. Default is 10ms (0.2ms for -S1 versions). Input and output response times cannot be set independently.
2. 40 pin FCN connector. Supplied separately. See "I/O Wiring Connectors" for ordering information.
3. 37 pin D-sub connector. Supplied separately. See "I/O Wiring Connectors" for ordering information.

MELSEC Q Series / iQ Combination I/O Modules

Combination input/output modules allow both input and output points to be combined in a single module. This offers the chance to reduce the number of I/O modules, enabling a more compact system in some applications.



Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080042	I/O Module Type Building Block User's Manual	Specifications & wiring diagrams for all Q Series digital I/O modules	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

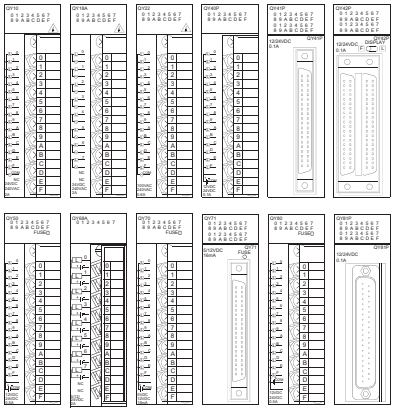
Combination I/O Modules

Model Number		QH42P	QX41Y41P (*1)	QX48Y57
Stocked Item		S	S	S
Certification		UL • cUL • CE		
Input Type		DC positive common (sink)		
No. of Input Points		32	32	8
Input Voltage		24VDC +20%/-15%		
Input Current (mA)		4		
Response Time (ms)	OFF-ON	1/5/10/20/70 (*2)		
	ON-OFF	1/5/10/20/70 (*2)		
Minimum On Voltage/Current		19VDC/3mA		
Maximum Off Voltage/Current		11VDC/1.7mA		
Points/Common		32	32	8
Output Type		Sink transistor		
No. of Output Points		32	32	7
Load Voltage		12-24VDC +20%/-15%		
Maximum Load Current		0.1A/pt, 2A/common	0.1A/pt, 2A/common	0.5A/pt, 2A/common
Response Time (ms)	OFF-ON	1		
	ON-OFF	1 (rated resistive load)		
External Supply Voltage/Current		12-24VDC +20%/-15%/15mA (24VDC)/common		
Protection		Thermal & short circuit	Thermal & short circuit	Fused (4A), with blown fuse detection
Points/Common		32	32	7
Connection Type		FCN (*3)	FCN (*3)	Screw Terminals
Maximum 5VDC Current Consumption (mA)		130	130	80
Weight (kg)		0.2		
Base Unit Slots Occupied		1		

Notes:
1. The QX41Y41P has consecutive I/O addressing, unlike the QH42P, and is meant to replace A Series I/O blocks.
2. Set response time by parameters in GX Works2. Default is 10ms (0.2ms for -S1 versions). Input and output response times cannot be set independently.
3. 40 pin FCN connector. Supplied separately. See "I/O Wiring Connectors" for ordering information.

MELSEC Q Series / iQ Digital Output Modules

Digital output modules provide the CPU interface for turning devices in your system on & off under program control.



Key Features:

- Relay (contact), sink & source transistor plus triac outputs to handle all common devices
- 16, 32 or 64 outputs per module, depending on module type
- Thermal & short-circuit protection on some modules
- Internal optoisolation
- Removable terminal blocks
- Established A Series connectors (FCN/D-sub type) on 32 & 64 I/O modules for compatibility with existing A Series terminal block (A6TBXY type) installations
- If you need to produce varying signal levels of voltage or current, please refer to the analog output modules section.

Model Number		QY10	QY18A	QY22	QY40P	QY41P	QY42P
Stocked Item		S	S	S	S	S	S
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Output Type		Relay	Isolated Relay	Triac	Sink Transistor	Sink Transistor	Sink Transistor
No. of Output Points		16	8	16	16	32	64
Load Voltage		24VDC/240VAC	24VDC/240VAC	100-240VAC, +5%	12-24VDC, +20/-15%	12-24VDC, +20/-15%	12-24VDC, +20/-15%
Maximum Load Current		2A/pt, 8A/common	2A/point	0.6A/pt, 4.8A/common	0.1A/pt, 1.6A/common	0.1A/pt, 2.0A/common	0.1A/pt, 2.0A/common
Response Time (ms)	OFF-ON	10	10	1	1	1	1
	ON-OFF	12	12	1ms+0.5 cycle (rated resistive load)	1 (rated resistive load)	1 (rated resistive load)	1 (rated resistive load)
External Supply Voltage/Current		N/A	N/A	N/A	12-24VDC (+20/-15%) 10mA	12-24VDC (+20/-15%) 10mA	12-24VDC (+20/-15%) 10mA
Protection		N/A; use surge suppressor	N/A; use surge suppressor	RC surge suppressor	Thermal & short-circuit	Thermal & short-circuit	Thermal & short-circuit
Points/Common		16	All points interdependent	16	16	32	64
Connection Type		Screw Terminal	Screw Terminal	Screw Terminal	Screw Terminal	FCN (*1)	FCN x 2 (*1)
Maximum 5VDC Current Consumption (mA)		430	240	250	65	105	150
Weight (kg)		0.22	0.22	0.4	0.16	0.15	0.17
Base Unit Slots Occupied		1					

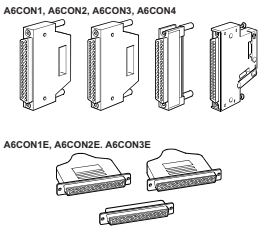
Model Number		QY50	QY68A	QY70	QY71	QY80	QY81P	QY82P
Stocked Item		S	S	-	-	S	S	S
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Output Type		High current sink Transistor	Independent sink/ source Transistor	Sink Transistor	Sink Transistor	Source Transistor	Source Transistor	Source Transistor
No. of Output Points		16	8	16	32	16	32	64
Load Voltage		12-24VDC, +20/ -15%	5-24VDC, +20/ -10%	5-12VDC, +25/ -10%	5-12VDC, +25/ -10%	12-24VDC, +20/ -15%	12-24VDC, +20/ -15%	12-24VDC, +20/ -15%
Maximum Load Current		0.5A/pt, 4.0A/ common	2A/pt, 8A total	16mA/pt, 256mA/ common	16mA/pt, 512mA/ common	0.5A/pt, 4A/ common	0.1A/pt, 2A/ common	0.1A/pt, 2A/ common
Response Time (ms)	OFF-ON	1	3	0.5	0.5	1	1	1
	ON-OFF	1 (rated resistive load)	10 (resistive load)	0.5 (resistive load)	0.5 (resistive load)	1 (rated resistive load)	1 (rated resistive load)	1 (rated resistive load)
External Supply Voltage/Current		12-24VDC (+20/ -15%) 20mA	N/A	5/12VDC (+25/ -10%), 90mA	5/12VDC (+25/ -10%), 170mA	12-24VDC (+20/ -15%)	12-24VDC (+20/ -15%)	12-24VDC (+20/ -15%)
Protection		Fuse (4A)	N/A	Fuse (1.6A)	Fuse (1.6A)	Fuse (4A)	Thermal & short-circuit	Thermal & short-circuit
Points/Common		16	All points interdependent	16	32	16	32	64
Connection Type		Screw Terminal	Screw Terminal	Screw Terminal	FCN	Screw Terminal	D-sub (*1)	FCN x2
Maximum 5VDC Current Consumption (mA)		80	110	95	150	80	95	160
Weight (kg)		0.17	0.14	0.14	0.14	0.17	0.15	0.15
Base Unit Slots Occupied		1						

Note:

1. Supplied separately. See "I/O Wiring Connectors" for ordering information.

MELSEC Q Series / iQ I/O Terminal Blocks and Covers

The 16 point Q Series I/O Modules terminal blocks and covers are available separately. Use these to replace original parts or to prepare wiring harnesses.



Model Number	Description	Stocked Item
K08H07500150	Q Series I/O terminal block assembly (screw terminals, cover door and label)	-
K08H07500151	Q Series I/O terminal block cover door and label only	-

Note: Many of these manuals are available by free download from our website, www.meau.com

MELSEC Q Series / iQ I/O Wiring Connectors

For the modules listed in the preceding I/O module sections, where connection type is given as “FCN” or “D-sub”, use the following connectors:

Model Number	Certification	Number of Pins	Wiring Type	Connector Type	Stocked Item
A6CON1	UL • cUL	40	Solder	FCN	S
A6CON2	UL • cUL	40	Crimp	FCN	S
A6CON3	UL • cUL	40	IDC	FCN	S
A6CON1E	UL • cUL	37	Solder	D-Sub	S
A6CON2E	UL • cUL	37	Crimp	D-Sub	-
A6CON3E	UL • cUL	37	IDC	D-Sub	-
A6CON4	-	40	Solder	FCN	-

Note: A6CON4 has a bidirectional cable clamp which allows installation depth to be reduced.

MELSEC Q Series / iQ Remote Terminal Blocks

For QXx1, QXx2, QYx1 and QYx2 type I/O modules, the following remote terminal blocks can be used to make I/O connections.

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080042	I/O Module Type Building Block User’s Manual	Specifications & wiring diagrams for all Q Series digital I/O modules	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Connector / Terminal Block Converter Modules

Model Number	Details	Dimensions (W x H x D)	Applicable Models	Stocked Item
A6TBXY36	32 point terminal block (standard type)	120 x 78.5 x 52	QX41, QX41-S1, QX42, QX42-S1, QY41P, QY42P, QH42P, QX41Y41P LY41NT1P, LY42NT1P, LY41PT1P, LY42PT1P	S
A6TBXY54	32 point terminal block (2-wire type)	155 x 78.5 x 52		-
A6TBX70	32 point terminal block (3-wire type)	190 x 78.5 x 52	QX41, QX41-S1, QX42, QX42-S1, QH42P, QX41Y41P	-
A6TBX36-E	For source type input modules (standard type)	120 x 78.5 x 52	QX81	S
A6TBY36-E	For source type output modules (standard type)	120 x 78.5 x 52	QY81P	S
A6TBX54-E	For source type input modules (2-wire type)	155 x 78.5 x 52	QX81	-
A6TBY54-E	For source type output modules (2-wire type)	155 x 78.5 x 52	QY81P	-
A6TBX70-E	For source type input modules (3-wire type)	190 x 78.5 x 52	QX81	-

MELSEC Q Series / iQ Remote Terminal Block Cables

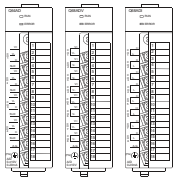
Use the following cables to make connections between Q Series / iQ I/O modules and the terminal blocks listed above.

Model Number	Details	Weight (kg)	Applicable Models	Stocked Item
AC05TB	0.5m (19.69 in), for sink modules	0.17	A6TBXY36, A6TBXY54, A6TBX70	S
AC10TB	1 m (39.37 in), for sink modules	0.23		
AC20TB	2 m (78.74 in), for sink modules	0.37		
AC30TB	3 m (118.11 in), for sink modules	0.51		
AC50TB	5 m (196.85 in), for sink modules	0.76		
AC80TB	8 m (314.96 in), for sink modules (common current not exceeding 0.5A)	1.2		-
AC100TB	10 m (393.7 in), for sink modules (common current not exceeding 0.5A)	1.5		-
AC05TB-E	0.5m (19.69 in), for source modules	0.17	A6TBX36-E, A6TBY36-E, A6TBX54-E, A6TBY54-E, A6TBX70-E	S
AC10TB-E	1 m (39.37 in), for source modules	0.23		
AC20TB-E	2 m (78.74 in), for source modules	0.37		
AC30TB-E	3 m (118.11 in), for source modules	0.51		
AC50TB-E	5 m (196.85 in), for source modules	0.76		-

Notes:

- “-E” cables use DSUB connectors, non “-E” cables use FCN connectors.
- The number of connectable I/O points is 32 for all connector/terminal block convertor modules. Two connector/terminal block converter modules and two cables for connector/terminal block converter modules are required for 64-point I/O modules.

MELSEC Q Series / iQ Analog Input Modules



Analog input modules provide an interface to the CPU for sensing variable real world levels of voltage and current signals. These signals are converted into digital values by the modules for use in programs. This enables the CPU to process variable signals such as pressure, speed & flow. For modules able to sense temperature, please refer to the Temperature Input modules section.

Key Features:

- Module set-up via menus in GX Works2; no programming required
- Voltage & current inputs, or exclusively voltage or current input
- 4 and 8 channel input versions
- Fast conversion (80 microseconds/channel)
- High accuracy (± 0.1%)
- High resolution (1 part in ±16,000 or 14 bits)
- Switchable resolution (1 part in ±4000, 1 part in ±12,000 & 1 part in ±16,000)
- Averaging function
- Module temperature drift compensation
- Maximum and minimum value hold

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080055	Analog-Digital Converter Module User's Manual	Covers Q64AD, Q68ADV, Q68ADI & GX Configurator-AD	Supplied as PDF with GX Configurator-AD	-
IB(NA)0800034E	Analog-Digital (Converter Module User's Manual (Hardware)	Basic Information on Q64AD, Q68ADV, Q68ADI	Yes	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Analog to Digital Converter Modules

Model Number		Q64AD	Q68ADV	Q68ADI
Stocked Item		S	S	S
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Number of Analog Input Points		4 points (4 channels)	8 points (8 channels)	8 points (8 channels)
Analog Input	Voltage	-10 to 10VDC (input resistance value 1MΩ)		-
	Current	0 to 20mADC (input resistance value 250Ω)	-	0 to 20mADC (input resistance value 250Ω)
Digital Output		16-bit signed binary (Normal resolution mode: -4096 to 4095, high resolution mode: -12288 to 12287, -16384 to 16383		

I/O Characteristics Max. Resolution

Analog Input Range		Normal Resolution Mode		High Resolution Mode	
		Digital Output Value	Max. Resolution	Digital Output Value	Max. Resolution
Voltage	0 to 10V	0 to 4000	2.5mV	0 to 16000	0.625mV
	0 to 5V	0 to 4000	1.25mV	0 to 12000	0.416mV
	1 to 5V	0 to 4000	1.0mV	0 to 12000	0.333mV
	-10 to 10	-4000 to 4000	2.5mV	-16000 to 16000	0.625mV
	User Range Setting	-4000 to 4000	0.375mV	-12000 to 12000	0.333mV
Current	0 to 20mA	0 to 4000	5µA	0 to 12000	1.66µA
	4 to 20mA	0 to 4000	4µA	0 to 12000	1.33µA
	User Range setting	-4000 to 4000	1.37µA	-12000 to 12000	1.33µA

Accuracy (Accuracy of Digital Output Value Relative to Maximum Value) (*1)

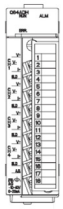
Analog Input Range		Normal Resolution Mode			High Resolution Mode		
		Ambient Temperature 0 to 55°C		Ambient Temperature 25±5°C	Ambient Temperature 0 to 55°C		Ambient Temperature 25±5°C
		With Temp. Drift Compensation	Without Temp. Drift Compensation		With Temp. Drift Compensation	Without Temp. Drift Compensation	
Voltage	0 to 10V	±0.3% (±12 digit)	±0.4% (±16 digit)	±0.1% (±48 digit)	±0.3% (±48 digit)	±0.4% (±64 digit)	±0.1% (±16 digit)
	-10 to 10						
	0 to 5V						
	1 to 5V				±0.3% (±36 digit)	±0.3% (±48 digit)	±0.1% (±12 digit)
	User Range Setting						
Current	0 to 20mA						
	4 to 20mA						
	User Range Setting						

Conversion Time	80 µs/channel (When temperature drift compensation is provided, time is 160 µs longer, regardless of the number of channels used.)		
Absolute Max. Input	Voltage: ±15V, current: ±30mA		
Insulation System	Across I/O terminals and PLC power supply: Photocoupler insulation; Across channels: No insulation		
I/O Device Points Occupied	16 points (I/O allocation: 16 intelligent points)		
Connection Terminal	18-point terminal block		
Internal Current Consumption (5VDC) (A)	0.63	0.64	0.64
Weight (kg)	0.18	0.19	0.19
Base Unit Slots Occupied	1		

Note:

1. "Digit" indicates a digital value. ±4 digit means that the digital value 1000 will vary between 996 and 1004.

MELSEC Q Series / iQ High Speed Analog Input Module



Key Features:

- High speed conversion (20µs/channel)
- Easy configuration and monitoring via GX Works2
- High resolution (1/20000)
- High accuracy (±0.1%)
- Logging of 10000 data per channel
- Flow amount integration function
- Digital clipping function

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080987	High Speed Analog Digital Converter Module User's Manual	Covers Q64ADH	Yes	S

High-Speed Analog Input Module

Model Number		Q64ADH
Stocked Item		-
Certification		UL • cUL • CE
Number of Analog Inputs		4 points (4 channels)
Digital Output		-20480 to 20479 (-32768 to 32767 when using the scaling function)
Analog Input	Voltage	10 to 10VDC (Input resistance 1MΩ)
	Current	0 to 20mADC (Input resistance 250Ω)
I/O Characteristics Maximum Resolution (*1)		See table below
Accuracy (Accuracy Relative to Maximum Analog Output Value) (*2)	Ambient Temperature 25 ±5°C	Within ±0.1% (±20 digit)
	Ambient Temperature 0 to 55°C	Within ±0.2% (±40 digit)
Conversion Speed (*3, *4, *5)		High speed: 20µs/channel; Medium speed: 80µs/channel; Low speed: 1ms/channel
Absolute Maximum Input		Voltage: ±15V, Current: 30mA (*6)
Offset / Gain Setting Count (*7)		Up to 50000 times
Isolation Method		Between I/O terminals and programmable controller power supply: photocoupler isolation; Between input channels: no isolation
Dielectric Withstand Voltage		Between I/O terminals and programmable controller power supply: 500VACrms for 1 minute
Insulation Resistance		Between I/O terminals and programmable controller power supply: 500VDC 10MΩ or higher
Number of Occupied I/O Points		16 points (I/O assignment: Intelligent 16 points)
Connected Terminal		18-point terminal block
Applicable Wire Size		0.3 to 0.75mm²
Applicable Solderless Terminal		R1.25-3 (solderless terminals with sleeve are not usable)
Internal Current Consumption (5VDC)		0.52A
Weight (kg)		0.18
Base Unit Slots Occupied		1 slot

I/O Characteristics Maximum Resolution (*1)

Analog Input Range		Digital Output Value	Maximum Resolution
Voltage	0 to 10V	0 to 20000	500µV
	0 to 5V		250µV
	1 to 5V		200µV
	-10 to 10V	-20000 to 20000	500µV
	1 to 5V (Extended mode)	-5000 to 22500	200µV
	User Range Setting	-20000 to 20000	219µV
Current	0 to 20 mA	0 to 20000	1000nA
	4 to 20 mA		800nA
	4 to 20V (Extended Mode)	-5000 to 22500	800nA
	User Range Setting	-20000 to 20000	878nA

Notes:

1. For details on the I/O conversion characteristics, refer to the following. I/O conversion characteristic of A/D conversion in the Users Manual.
2. Except when receiving noise influence.
3. The default value is 20µs/channel.
4. The logging function can be used only in the middle speed (80µs/channel) or low speed (1ms/channel).
5. The flow amount integration function can be used only in the low speed (1ms/channel).
6. This is a momentary current value which does not cause damage to internal resistors of the module. The maximum input current value for constant application is 24mA.
7. If the number of offset/gain settings exceeds 50000 times, an error occurs.

MELSEC Q Series / iQ Isolated Analog Modules

For some applications, it is essential that there is channel-to-channel isolation between analog inputs or outputs. These modules provide galvanic isolation between each channel so there is no common connection from one channel to any other.

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080277	Channel Isolated High Resolution Analog-Digital Converter Module User's Manual	Covers Q64AD-GH, Q62AD-DGH & GX Configurator-AD	Supplied as PDF with GX Configurator-AD	S
IB(NA)0800223	Q64AD-GH Channel Isolated High Resolution Analog-Digital Converter Module	Basic information on Q64AD-GH	Yes	S

8 CH Analog Module (Isolated Analog)

Model Number		**Q68AD-G**
Stocked Item		S
Certification		UL • cUL • CE
Number of Analog Inputs		8 points (8 channels)
Digital Output		16-bit signed binary (normal resolution mode: -4096 to 4095, high resolution mode: -12288 to 12287, -16384 to 16383)
Analog Input	**Voltage**	-10 to 10VDC (Input impedance 1ΩM or more)
	Current	0 to 20mADC (Input resistance 250Ω)
I/O Characteristics Maximum Resolution		See table below
Accuracy (Accuracy Relative to Maximum Analog Output Value)	**Reference Accuracy (*1)**	±0.1%; Normal resolution mode : ±4digit (*2); High resolution mode (0 to 10V, -10 to 10V): ±16digit (*2) High resolution mode (Other than the above ranges): ±12digit (*2)
	Temp. Coefficient (*3)	±71.4ppm/°C (0.00714%/°C)
Conversion Speed		10ms / channel
I/O Device Points Occupied		16 points
Isolation Specifications		See table below
Connector Type		A6CON1 or A6CON4
Internal Current Consumption (5VDC)		0.46A
Weight (kg)		0.16
Base Unit Slots Occupied		1

Input	Analog Input Range	Normal Resolution Mode		High Resolution Mode	
		Digital Output Value	Maximum Resolution	Digital Output Value	Maximum Resolution
Voltage	0 to 5V	0 to 4000	2.5mV	0 to 1600	0.625mV
	0 to 5V		1.25mV	0 to 1200	0.416mV
	1 to 5V		1.0mV		0.333mV
	1 to 5V (Expanded Mode)	-1000 to 4500	1.0mV	-3000 to 13500	0.333mV
	-10 to 10V	-4000 to 4000	2.5mV	-16000 to 16000	0.625mV
	User Range Setting		0.375	-12000 to 12000	0.333mV
Current	0 to 20 mA	0 to 4000	5μA	0 to 12000	1.66μA
	4 to 20 mA		4μA		1.33μA
	4 to 20V (Expanded Mode)	-1000 to 45000	4μA	-3000 to 13500	1.33μA
	User Range Setting	-4000 to 4000	1.37μA	-12000 to 12000	1.33μA

Isolated Part	Isolation Method	Dielectric Strength	Insulation Resistance
Between I/O Terminal and Programmable Controller Power Supply	Transformer Isolation	500VAC rms, 1min.	500VDC 10MΩ or more
Between Analog Input Channels		1000VAC rms, 1min.	

Notes:

1. Accuracy of offset/gain setting at ambient temperature
2. "digit" indicates a digital value.
3. Accuracy per temperature change of 1°C Example: Accuracy when temperature changes from 25 to 30°C ±0.1% (reference accuracy) + 0.00714 %/°C (temperature coefficient) x 5°C (temperature change difference) = 0.1357%

High Resolution Analog Module (Isolated Analog Input Channels)

Model Number		**Q64AD-GH**
Stocked Item		S
Certification		UL • cUL • CE
Number of Analog Input Points		4 points (4 channels)
Analog Input	**Voltage**	-10 to 10VDC (Input resistance 1MΩ)
	Current	0 to 20 mADC (Input resistance 250Ω)
Digital Output		16-bit signed binary (-32768 to 32768); 32-bit signed binary (-65536 to 65536)
I/O Characteristics Maximum Resolution		See table below
Accuracy (Accuracy Relative to Full-Scale)	**Reference Accuracy (*1)**	±0.05%; Digital output value(32 bit): ±32 digit (*2); Digital output value (16 bit): ±16 digit (*2)
	Temp. Coefficient (*3)	±71.4 ppm / °C (0.00714% / °C)
Conversion Speed		10ms / 4 channels
Absolute Maximum Input		Voltage: ± 15V; Current: ± 30mA
Withstanding Voltage Isolation Method		Between I/O terminal and PLC power supply: Photocoupler insulation; Between analog input channels: transformer isolation
Dielectric Strength		1780VAC ms / 3 cycles (elevation 2000m)
Isolation Voltage		Between I/O terminal and PLC power supply: 500VDC 20MΩ more
I/O Device Points Occupied		16 points
Connected Terminal		18 points terminal block
Applicable Solderless Terminals		R1.25-3 (A solderless terminals with sleeves cannot be used)
Internal Current Consumption (5VDC)		0.89 A
Weight (kg)		0.20
Base Unit Slots Occupied		1

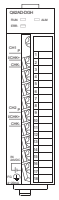
I/O Characteristics Maximum Resolution

Input	Analog Input Range	Maximum Resolution		Digital Output Value (32-Bit)	Digital Output Value (16-Bit)
		32-Bit	16-Bit		
Voltage	0 to 10V	156.3µV	312.6µV	0 to 64000	0 to 32000
	0 to 5V	78.2µV	156.4µV		
	1 to 5V	62.5µV	125.0µV		
	Users Input Range (Uni-Polar)	47.4µV	94.8µV		
	-10 to 10V	156.3µV	312.6µV	-64000 to 64000	-32000 to 32000
	Users Input Range (Bi-Polar)	47.4µV	94.8µV		
Current	0 to 20 mA	312.5nA	625.0µV	0 to 64000	0 to 32000
	4 to 20 mA	250.0nA	500.0µV		
	Users Input Range (Uni-Polar)	151.6nA	303.2µV		

Notes:

1. Accuracy when consistent at some temperature within the ambient temperature (to 55°C)
2. "Digit" indicates a digital output value.
3. Accuracy per temperature change of 1°C. Example: Accuracy when temperature change from 25 to 30°C. 0.05% (reference accuracy + 0.00714% / °C (temperature coefficient) x 5 °C (temperature change difference) = 0.0857%

Isolated Analog Input Module with Signal Conditioning Function



Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080277	Channel Isolated High Resolution Analog-Digital Converter Module User's Manual	Covers Q64AD-GH, Q62AD-DGH & GX Configurator-AD	Supplied as PDF with GX Configurator-AD	-
IB(NA)0800224	Channel Isolated High Resolution Analog-Digital Converter Module (with Signal Conditioning Function)	Basic information on Q62AD-DGH	Yes	-

Isolated Analog Input Module with Signal Conditioning Function

Model Number			Q66AD-DG
Stocked Item			S
Certification			UL • cUL • CE
Connecting Section with 2-Wire Transmitter	Input Specification	Number of Analog Input	6 points (6 channels)
		Analog Input	4 to 20 mADC (Input resistance 250Ω)
	Supply Power Specification	Supply Voltage	26 ±2VDC
		Maximum Supply Current	24mADC
		Short-Circuit Protection	Available; Limit current: 25 to 35mA
	Check Terminals		Available
Digital Output			16-bit signed binary (normal resolution mode: -96 to 4095, high resolution mode: -288 to 12287)

I/O Characteristics Maximum Resolution

Analog Input Range	Normal Resolution Mode		High Resolution Mode	
	Digital Output Value	Maximum Resolution	Digital Output Value	Maximum Resolution
0 to 20mA	0 to 4000	5µA	0 to 12000	1.66µA
4 to 20mA		4µA		1.33µA
4 to 20mA (Expanded Mode)	-1000 to 4500	4µA	-3000 to 13500	1.33µA
User Range Setting (*4)	0 to 4000	1.37µA	0 to 12000	1.33µA

Accuracy (Accuracy Relative to Full-Scale)	Reference Accuracy (*1)	±0.1% (Normal resolution mode: ±4digit (*2) High resolution mode: ±12digit (*2))
	Temp. Coefficient (*3)	±71.4 ppm / °C (0.00714% / °C)
Conversion Speed		10ms / channel

Insulation

Isolated Part	Insulation Method	Dielectric Withstand Voltage	Isolation Voltage
Between I/O Terminal and Programmable Controller Power Supply	Transformer Isolation	500VAC rms, 1min	500VDC 10MΩ or more
Between Analog Input Channels		1000VAC rms, 1min.	
Between External Power Supply and Analog Input		500VAC rms, 1min	

I/O Device Points Occupied	16 points
Connected Terminal	18 points terminal block
Connector Type	A6CON4
Internal Current Consumption (5VDC)	0.42 A
External Power Supply	24VDC +20%, -15%; Ripple, spike within 500mVp-p; Inrush current: 5.0A, within 400µs; 0.36A
Weight (kg)	0.22
Base Unit Slots Occupied	1

Notes:

1. Accuracy of offset/gain setting at ambient temperature
2. "digit" indicates a digital value.
3. Accuracy per temperature change of 1°C. Example: Accuracy when temperature changes from 25 to 30°C 0.1% (reference accuracy) + 0.00714 % / °C (temperature coefficient) x 5°C (temperature change difference) = 0.1357%

High Resolution Isolated Analog Input Module with Signal Conditioning Function

<table>
<tr><td colspan="3">Model Number</td><td>Q62AD-DGH</td></tr>
<tr><td colspan="3">Stocked Item</td><td>S</td></tr>
<tr><td colspan="3">Certification</td><td>CE</td></tr>
<tr><td rowspan="5">Connecting Section With 2-Wire Transmitter</td><td rowspan="2">Input Specification</td><td>Number of Analog Input</td><td>2 points (2 channels)</td></tr>
<tr><td>Analog Input</td><td>4 to 20 mADC (*1) (Input resistance 250Ω)</td></tr>
<tr><td rowspan="3">Supply Power Specification</td><td>Supply Voltage</td><td>26 ±2VDC</td></tr>
<tr><td>Maximum Supply Current</td><td>24mADC</td></tr>
<tr><td>Short-Circuit Protection</td><td>Available; Limit current: 25 to 35mA</td></tr>
<tr><td colspan="2">Check Terminals</td><td>Available</td></tr>
<tr><td colspan="3">Digital Output</td><td>16-bit signed binary (-768 to 32767); 32-bit signed binary (-1538 to 65535)</td></tr>
<tr><td colspan="3">I/O Characteristics Maximum Resolution</td><td>
<table>
<tr><th rowspan="2">Analog Input Range</th><th colspan="2">Maximum Resolution</th><th rowspan="2">Digital Output Value (32-Bit)</th><th rowspan="2">Digital Output Value (16-Bit)</th></tr>
<tr><th>32-Bit</th><th>16-Bit</th></tr>
<tr><td>4 to 20mA</td><td>250.0nA</td><td>500.0nA</td><td rowspan="2">0 to 64000</td><td rowspan="2">0 to 32000</td></tr>
<tr><td>User range Setting</td><td>151.6nA</td><td>303.2nA</td></tr>
</table>
</td></tr>
<tr><td colspan="2" rowspan="2">Accuracy (Accuracy Relative to Full-Scale)</td><td>Reference Accuracy (*2)</td><td>±0.05%; Digital output value(32 bit): ±32 digit (*3); Digital output value (16 bit): ±16 digit (*3)</td></tr>
<tr><td>Temp. Coefficient (*4)</td><td>±71.4 ppm / °C (0.00714% / °C)</td></tr>
<tr><td colspan="3">Conversion Speed</td><td>10ms / 2 channels</td></tr>
<tr><td colspan="3">Insulation</td><td>
<table>
<tr><th>Isolated Part</th><th>Insulation Method</th><th>Dielectric Strength</th><th>Isolation Voltage</th></tr>
<tr><td>Between I/O Terminal and PLC Power Supply</td><td>Photocoupler Insulation</td><td rowspan="3">1780 VAC rms / 3 cycles (elevation 2000m)</td><td rowspan="3">500 VDC 10MΩ or more</td></tr>
<tr><td>Between Analog Input Channels</td><td>Transformer Isolation</td></tr>
<tr><td>Between External Power Supply and Analog Input</td><td>Transformer Isolation</td></tr>
</table>
</td></tr>
<tr><td colspan="3">I/O Device Points Occupied</td><td>16 points</td></tr>
<tr><td colspan="3">Connected Terminal</td><td>18 points terminal block</td></tr>
<tr><td colspan="3">Applicable Solderless Terminals</td><td>R1.25-3 (A solderless terminals with sleeves cannot be used)</td></tr>
<tr><td colspan="3">Internal Current Consumption (5VDC)</td><td>0.33 A</td></tr>
<tr><td colspan="3">External Power Supply</td><td>24VDC +20%, -15%; Ripple, spike within 500mVp-p; Inrush current: 5.5A, within 200μs; 0.19A</td></tr>
<tr><td colspan="3">Weight (kg)</td><td>0.19</td></tr>
<tr><td colspan="3">Base Unit Slots Occupied</td><td>1</td></tr>
</table>

Notes:

1. User range setting is 2 to 24mA
2. Accuracy of offset/gain setting at ambient temperature. Q62AD-DGH needs to be powered on 30 minutes prior to operation for compliance to the specification (accuracy)
3. "Digit" indicates a digital output value.
4. Accuracy per temperature change of 1°C.
   Example: Accuracy when temperature change from 25 to 30°C. 0.05% (reference accuracy + 0.00714% / °C (temperature coefficient) x 5 °C (temperature change difference) = 0.0857%

MELSEC Q Series / iQ Combination Analog Module

Model Number		**Q64AD2DA**
Stocked Item		S
Certification		UL • cUL • CE
Number of Analog Input Points		4 points (4 channels)
Analog Input	**Voltage**	-10 to 10VDC (input resistance value 1MΩ)
	Current	0 to 20mADC (input resistance value 250Ω)
Digital Output		Normal resolution mode:-96 to 4095, -4096 to 4095, -1096 to 4595 High resolution mode:-384 to 16383, -288 to 12287, -16384 to 16383, -3288 to 13787

I/O Characteristics Max. Resolution

Analog Input Range		Normal Resolution Mode		High Resolution Mode	
		Digital Output Value	Max. Resolution	Digital Output Value	Max. Resolution
Voltage	0 to 10V	0 to 4000	2.5mV	0 to 16000	0.625mV
	0 to 5V		1.25mV	0 to 12000	0.416mV
	1 to 5V		1.0mV	0 to 12000	0.333mV
	-10 to 10V	-4000 to 4000	2.5mV	-16000 to 16000	0.625mV
	1 to 5V (Extended mode)	-1000 to 4500	1.0mV	-3000 to 13500	0.333mV
Current	0 to 20mA	0 to 4000	5μA	0 to 12000	1.66μA
	4 to 20mA		4μA		1.33μA
	4 to 20mA (Extended mode)	-1000 to 4500	4μA	-3000 to 13500	1.33μA

Accuracy (Accuracy of Digital Output Value Relative to Maximum Value) (*1)

Analog Input Range		Normal Resolution Mode		High Resolution Mode	
		Ambient Temperature 0 to 55°C	Ambient Temperature 25 ±5°C	Ambient Temperature 0 to 55°C	Ambient Temperature 25 ±5°C
Voltage	0 to 10V	±0.4% (±16 digit)	±0.1% (±4 digit)	±0.4% (±64 digit)	±0.1% (±16 digit)
	-10 to 10				
	0 to 5V				
	1 to 5V			±0.4% (±48 digit)	±0.1% (±12 digit)
	1 to 5V (Extended mode)				
Current	0 to 20mA				
	4 to 20mA				
	4 to 20mA (Extended mode)				

Conversion Time		500 μs/channel
Absolute Max. Input		Voltage: ±15V, current: ±30mA (*2)
Number Of Analog Output Points		2 points (2 channels)
Digital Input		Normal resolution mode: -96 to 4095, -4096 to 4095; High resolution mode: -288 to 12287, -16384 to 16383
Analog Output	**Voltage**	-10 to 10VDC (External load resistance: 1MΩ)
	Current	0 to 20mADC (External load resistance: 600Ω)

I/O Characteristics Maximum Resolution

Analog Output Range		Normal Resolution Mode		High Resolution Mode	
		Digital Input Value	Maximum Resolution	Digital Input Value	Maximum Resolution
Voltage	0 to 5V	0 to 4000	1.25 mV	0 to 12000	0.416 mV
	1 to 5V		1.0 mV		0.333 mV
	-10 to 10V	-4000 to 4000	2.5 mV	-16000 to 16000	0.625 mV
Current	0 to 20 mA	0 to 4000	5μA	0 to 12000	1.66μA
	4 to 20 mA		4μA		1.33μA

Accuracy (Accuracy With Respect To Maximum Analog Output Value)

Analog Output Range		Ambient Temperature	
		0 to 55°C	25 ±5°C
Voltage	0 to 5V	±0.3% (±30mV)	±0.1% (±10mV)
	1 to 5V		
	-10 to 10V		
Current	0 to 20 mA	±0.3% (±60 μA)	±0.1% (±20 μA)
	4 to 20 mA		

Conversion Speed	500 μs/channel
Absolute Maximum Output	Voltage: 12V Current: 21mA
Output Short Circuit Protection	Available
I/O Device Points Occupied	16 points (I/O assignment: Intelligent 16 points)
Connected Terminals	18 points terminal block
Applicable Solderless Terminal	A/D conversion part, D/A conversion part: R1.25-3 (Solderless terminals with sleeves are unavailable.) External power supply 24VDC, FG terminal connection: Not available
External Supply Power	24VDC 15%; Ripple, spike 500mVP-P or less; Inrush current: 2.5A 150μs or less; Current consumption: 0.19A
Internal Current Consumption (5VDC)	0.17A
Weight (kg)	0.23
Base Unit Slots Occupied	1

Notes:

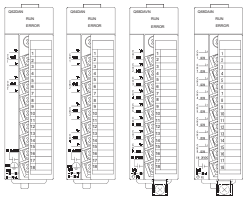
1. A1: The selection ranges and accuracies have the following relationships.

Ambient Temperature	Temperature Range		
	Pt100 and JPt100 : -20 to 120°C	Pt100 : -200 to 850°C	JPt100 : -180 to 600°C
0 to 55°C	±0.3°C	±2.125°C	±1.5°C
25 ±5°C	±0.096°C	±0.68°C	±0.48°C

The conversion speed is a period from when a temperature is input and converted into a corresponding digital value until the value is stored into the buffer memory. When two or more channels are used, the conversion speed is "40ms number of conversion enabled channels".

2. For output in the case of disconnection detection, select any of "Value immediately before disconnection", "Up scale (maximum value of measured temperature range + 5% of measured temperature range)", "Down scale (minimum value of measured temperature range - 5% of measured temperature range)" or "Given value".

MELSEC Q Series / iQ Analog Output Modules



Analog output modules allow the CPU to convert digital program values to real world analog current or voltage signals. These can then be used to control actuators whose properties vary between set limits, such as valve openings, speed control, extension distance, etc.

Key Features:

- Module set-up via menus in GX Works2; no programming required
- 2, 4 & 8 channel versions
- Fast conversion (80 microseconds/channel)
- High accuracy (±0.1%)
- High resolution (1 part in ±16,000 or 14 bits)
- Switchable resolution (1 part in ±4000, 1 part in ±12,000 and 1 part in ±16,000)
- Variable offset/gain
- Synchronous output function establishes output changes on a set timebase
- Output hold/clear function
- Output test when CPU is in STOP mode

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080054	Digital-Analog Converter Module User's Manual	Covers Q62DAN, Q64DAN, Q68DAVN, Q68DAIN GX Configurator-DA	Supplied as PDF with GX Configurator-DA	-
IB(NA)0800321E	D/A Converter Module Users' Manual (Hardware)	Basic information on Q62DAN, Q64DAN, Q68DAVN, Q68DAIN	Yes	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Model Name		Q62DAN	Q64DAN	Q68DAVN	Q68DAIN
Stocked Item		S	S	S	S
Number Of Analog Output Points		2 points (2 channels)	4 points (4 channels)	8 points (8 channels)	
Digital Input		16-bit signed binary (normal resolution mode: -4096 to 4095, High resolution mode: -12288 to 12287, -16384 to 16383)			
Analog Output	Voltage	-10 to 10VDC (External load resistance value: 1KΩ to 1MΩ)			-
	Current	0 to 20 mA DC (External load resistance value: 0Ω to 600Ω)		-	0 to 20 mA DC (External load resistance value: 0Ω to 600Ω)
I/O Characteristics, Maximum Resolution					
Accuracy (Accuracy With Respect To Maximum Analog Output Value)	Ambient Temp. 25 ±5°C	Within ± 0.1 % (Voltage: ±10 mV, Current: ± 20μA)			
	Ambient Temp. 0 to 55°C	Within ± 0.3 % (Voltage: ± 30 mV, Current: ± 60μA)			
Conversion Speed		80μs/channel			
Output Short Circuit Protection		Available			
I/O Device Points Occupied		16 points (I/O assignment: Intelligent 16 points)			
Connected Terminals		18-points terminal block			
Applicable Solderless Terminal		R1.25-3 (A solderless terminal with sleeve cannot be used)		FG terminal: R1.25-3, 1.25-YS3, RAV1.25-3, V1.25-YS3A; Other terminals than FG: R1.25-3 (A solderless terminal with sleeve cannot be used)	
External Supply Power		24VDC + 20 %, -15 %			
		Ripple, spike 500 mV P-P or less			
		Inrush current: 2.5 A, within 250μs	Inrush current: 2.5 A, within 260μs	Inrush current: 2.5 A, within 230μs	Inrush current: 2.5 A, within 230μs
		0.15 A	0.24 A	0.20 A	0.27 A
Internal Current Consumption (5VDC)		0.33 A	0.34 A	0.38 A	0.38 A
Weight (kg)		0.19	0.20	0.20	0.20
Base Unit Slots Occupied		1			

Analog Output Range		Normal Resolution Mode		High Resolution Mode	
		Digital Input Value	Maximum Resolution	Digital Input Value	Maximum Resolution
Voltage	0 to 5V	0 to 4000	1.25 mV	0 to 12000	0.416 mV
	1 to 5V		1.0 mV		0.333 mV
	-10 to 10V	-4000 to 4000	2.5 mV	-16000 to 16000	0.625 mV
	User Range Setting		0.75 mV	-12000 to 12000	0.333 mV
Current	0 to 20 mA	0 to 4000	5μA	0 to 12000	1.66μA
	4 to 20 mA		4μA		1.33μA
	User Range Setting	-4000 to 4000	1.5μA	-12000 to 12000	0.83μA

Isolated Analog Output Modules with Output Monitor

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080281	Channel Isolated Digital-Analog Converter Module Q62DA-FG/GX Configurator-DA	Covers Q62DA-FG/GX Configurator-DA	Supplied as PDF with GX Configurator-DA	S
IB(NA)0800277	Channel Isolated Digital-Analog Converter Module Q62DA-FG	Basic information on Q62DA-FG	Yes	S

Model Number		Q62DA-FG
Stocked Item		S
Certification		UL • cUL • CE
Number of Analog Outputs		2 points (2 channels)
Digital Input		16-bit signed binary (-12288 to 12287, -16384 to 16383)
Analog Output	Voltage	-12 to 12VDC (External load resistance 1k to 1MΩ)
	Current	0 to 20 mADC (External load resistance: 0 to 600Ω); 0 to 22 mADC
I/O Characteristics Maximum Resolution		See table below
Accuracy (Accuracy Relative to Maximum Analog Output Value)	Reference Accuracy (*1)	within ±0.1%; (Voltage: ±10mV, Current: ±20μA)
	Temp. Coefficient (*2)	±80 ppm / °C (0.008% / °C)
Conversion Speed		10ms / 2 channels
Output Monitor	Resolution	12 bit
	Reference Accuracy (*1)	±0.2%
	Temperature Coefficient (*2)	±160ppm / °C (0.016% / °C)
Output Short-Circuit Protection		Available
I/O Device Points Occupied		16 points
Isolation Specifications		See table below
Connected Terminal		18 points terminal block
Applicable Solderless Terminals		R1.25-3 (A solderless terminals with sleeves cannot be used)
Internal Current Consumption (5VDC)		0.37A
External Power Supply		24VDC +20%, -15%; Ripple, spike within 500mVp-p; Inrush current: 5.2A, within 300μs, 0.3A
Weight (kg)		0.20
Base Unit Slots Occupied		1

	Analog Output Range	Digital Input Value	Maximum Resolution
Voltage	0 to 5V	0 to 12000	0.416mV
	1 to 5V		0.333mV
	-10 to 10V	-16000 to 16000	0.625mV
	User Range Setting 2	-12000 to 12000	0.366mV
	User Range Setting 3		0.183mV
Current	0 to 20 mA	0 to 12000	1.66μA
	4 to 20 mA		1.33μA
	User Range Setting 1	-12000 to 12000	0.671μA

Isolated Part	Isolation Method	Dielectric Strength	Insulation Resistance
Between I/O Terminal and Controller Power Supply	Photocoupler Insulation	1780VAC rms / 3 cycles (elevation 2000m)	500VDC 10MΩ or more
Between Analog Output Channels	Transformer Isolation		
Between External Power Supply and Analog Output	Transformer Isolation		

Notes:

1. Accuracy of offset/gain setting at ambient temperature Q62AD-DGH needs to be powered on 30 minutes prior to operation for compliance to the specification (accuracy).
2. Accuracy per temperature change of 1°C.
   Example: Accuracy when temperature change from 25 to 30°C. 0.1% (reference accuracy + 0.008% / °C (temperature coefficient) x 5 °C (temperature change difference) = 0.14%

Model Number		Q66DA-G
Stocked Item		S
Certification		UL • cUL • CE
Number of Analog Outputs		6 points (6 channels)
Digital Input		16-bit signed binary (normal resolution mode:-4096 to 4095; high resolution mode: -12288 to 12287, -16384 to 16383)
Analog Output	Voltage	-12 to 12VDC (External load resistance 1k to 1MΩ)
	Current	0 to 20 mADC (External load resistance: 0 to 600Ω); 0 to 22 mADC (External load resistance: Please refer to Note 3)

I/O Characteristics Maximum Resolution

Input	Analog Input Range	Normal Resolution Mode		High Resolution Mode	
		Digital Input Value	Maximum Resolution	Digital Input Value	Maximum Resolution
Voltage	0 to 5V	0 to 4000	1.25mV	0 to 12000	0.416mV
	1 to 5V		1.0mV		0.333mV
	-10 to 10V	-4000 to 4000	2.5mV	-16000 to 16000	0.625mV
	User Range Setting 2		.075mV	-12000 to 12000	0.400mV
	User Range Setting 3		0.375mV		0.210mV
Current	0 to 20 mA	0 to 4000	5µA	0 to 12000	1.66µA
	4 to 20 mA		4µA		1.33µA
	User Range Setting 1	-4000 to 4000	1.5µA	-12000 to 12000	0.95µA

Accuracy (Accuracy Relative to Maximum Analog Output Value)	Reference Accuracy (*1)	within ±0.1%; (Voltage: ±10mV, Current: ±20µA)
	Temp. Coefficient (*2)	±80 ppm / °C (0.008% / °C)
Conversion Speed		6ms / channels
Output Monitor	Resolution	15-bit
	Reference Accuracy (*1)	±0.1%
	Temperature Coefficient (*2)	0.008% / °C
Output Short-Circuit Protection		Available
I/O Device Points Occupied		16 points

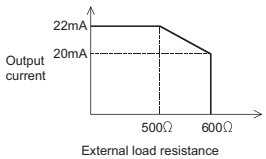
Isolation Specifications

Isolated Part	Isolation Method	Dielectric Strength	Insulation Resistance
Between Output Terminal and Controller Power Supply	Transformer Isolation	500VAC rms, 1 min.	500VDC 10MΩ or more
Between Analog Output Channels		1000VAC rms, 1 min.	
Between External Power Supply and Analog Output		500VAC rms, 1 min.	

Connected Terminal	40-pin connector
Applicable Solderless Terminals	R1.25-3 (A solderless terminals with sleeves cannot be used)
Internal Current Consumption (5VDC)	0.62A
External Power Supply	24VDC, +20%, -15%; Ripple, spike within 500 mV p-p; Inrush current: 4.8A, within 400µs; 0.22A
Weight (kg)	0.22
Base Unit Slots Occupied	1

Notes:

1. Accuracy of offset/gain setting at ambient temperature Q66DA-G needs to be powered on 30 minutes prior to operation for compliance to the specification (accuracy).
2. Accuracy per temperature change of 1 °C
   Example: Accuracy when temperature changes from 25 to 30 °C
   0.1% (Reference accuracy) + 0.008%/ °C (temperature coefficient) x 5 °C (temperature change difference) = 0.14%
3. The following indicates the external load resistance when output current is 20mA or more.



Q Series/iQ HART Interface Module

The Q Series HART® Interface I/O Modules provide total access to process data and device diagnostics from over 1000 HART enabled field devices. The system is designed to use the 4-20mA (or 0-20mA) control signal from traditional analog devices as well as the 4-20mA and digital process data from HART devices, allowing up to 5 (1 analog, 4 digital process variables) control points on a single 2-wire connection.

Key Features:

- 8 channel 4-20mA I/O modules (traditional or HART enabled 4-20mA devices), up to 512 channels on a single Process CPU
- HART Digital Communications combines high speed control (4-20mA) with access to multivariable process data
- Compatible with HART revisions 5, 6 and 7
- Configuration of field devices via an industry standard FDT frame application
- Reduces integration time and device setup through standardized interfaces

Model Number		ME1AD8HAI-Q
Stocked Item		-
Number of Analog Input Points		8 points (8 channels)
Analog Input	Current	0 to 20 mA DC • 4 to 20 mA DC
	Absolute Maximum Input	± 30 mA
	Input Resistance	250Ω
	Short-Circuit Protection	Available
	Primary Filter	Hz (3 dB), HART signal is 1200 Hz with 1 mAP-P
Digital Output		16-bit signed binary (–768 to 32767)
I/O Characteristics, Maximum Resolution		Analog Input Range: 0 to 20 mA / 4 to 20 mA; Digital Output Value: 0 to 32000; Maximum Resolution: 625.0 nA / 500.0 nA
Accuracy (Relative to Digital Output Value) (*1)		±0.15% (±48 digit) (*2)
Cycle Time		80 ms (Independent to the number of used channels)
Insulation Method	Between the I/O Terminals and PLC Power Supply	Photocoupler insulation
	Between Analog Input Channels	Non-insulated
HART Modem		FSK Physical Layer, multiplexed
HART Functions		Protocol Revision 6 support • 4 Process variables support (PV, SV, TV, QV) • FDT/DTM support
Number of I/O Occupied Points		32 points (I/O assignment: Intelligent 32 points)
External Wiring Connection System		18-points terminal block
Applicable Wire Size		Refer to the HART specification for more details. The external power supply voltage of the ME1AD8HAI-Q should be enough for correct operation of the analog transmitter. (*3, *4)
Applicable Solderless Terminals		R1.25-3 (Solderless terminals with sleeves cannot be used)
External Supply Power	Voltage	24VDC (+20%, -15%); ripple, spike within 500mVP-P
	Current (A)	0.3
	Inrush Current	5.5 A within 200 µs
Online Module Change		Not supported
Internal Current Consumption (5VDC) (A)		0.32
Weight (kg)		0.19
Base Unit Slots Occupied		1

Notes:

1. ME1AD8HAI-Q needs to be powered on 30 minutes prior to operation for compliance to the specification (accuracy).
2. "digit" indicates a digital value.
3. Use case:For distances up to 800 m, the wire size of 0.51 mm diameter with 115 nF/km cable capacitance and 36.7 Ω/km cableresistance can be applied.
4. Refer to the calculation example shown in section 4.4.2 (External wiring).

Q Series / iQ Load Cell Input Module

Model Number	Q61LD
Stocked Item	S
Certification	UL • cUL • CE
Number of Analog Inputs	1 point (1 channel)
Digital Output	32-bit signed binary; 0 to 10000
Analog Input Range (Load Cell Rated Output)	0.0 to 1.0mV/V, 0.0 to 2.0mV/V, 0.0 to 3.0mV/V
I/O Characteristics Maximum Resolution	See table below
Accuracy (Accuracy Relative to Maximum Analog Output Value)	Nonlineality: Within ±0.01%/FS (Ambient temperature 25°C); Zero drift: Within ±0.25µV/°C RTI; Gain drift: Within ±15 ppm/°C
Conversion Speed	10ms
Accuracy (Accuracy Relative to Analog Input (Load Cell Rated Output) of a Module)	Nonlineality: Within ±0.01%/FS (Ambient temperature 25°C); Zero drift: Within ±0.25µV/°C RTI; Gain drift: Within ±15 ppm/°C
I/O Device Points Occupied	16 points
Connected Terminal	18 point terminal block
Applicable Solderless Terminals	R1.25-3 (A solderless terminal cannot be used)
Internal Current Consumption (5VDC)	0.48A
External Power Supply	24VDC +20%, -15%; Ripple, spike within 500mVp-p; Inrush current: 5.2A, within 300µs, 0.3A
Weight (kg)	0.17
Base Unit Slots Occupied	1

I/O Characteristics Maximum Resolution

Analog Input Range		Digital Output Value	Maximum Weighing Capacity Output Value	Maximum Resolution
Load cell rated output	0 to 1.0mV/V	0 to 10000	-99999 to 99999	0.5µA
	0 to 2.0mV/V			1.0µA
	0 to 3.0mV/V			1.5µA

Q Series / iQ Isolated Thermocouple Input Modules

Model Number		Q68TD-G-H01	Q68TD-G-H02
Stocked Item		S	S
Certification		UL • cUL • CE	
Number of Analog Inputs		8 channels + cold junction compensation channels / 1 module	
Analog Output	Temperature Conversion Value	16-bit signed binary (-2700 to 18200)	
	Scaling Value	16-bit signed binary	
Thermocouple Compliance Standards		JIS C1602-1995, IEC 60584-1 (1995),IEC60584-2 (1982)	
Conversion Speed (*1)		320ms/8 channels	640ms/8 channels
Output Monitor	Resolution	12 bit	
	Reference Accuracy (*2)	±0.2%	
	Temperature Coefficient (*3)	±160ppm / °C (0.016% / °C)	
Output Short-Circuit Protection		Available	
I/O Device Points Occupied		16 points	
Isolation Specifications		See table below	
Connected Terminal		18 point terminal block	
Connector Type		A6CON4 (*4)	
Internal Current Consumption (5VDC)		0.49A	0.65A
Weight (kg)		0.18	0.22
Base Unit Slots Occupied		1	

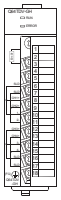
Isolation Specifications

Isolated Part	Isolation Method	Dielectric Strength	Insulation Resistance
Between thermocouple input channel and programmable controller power supply	Transfer Isolation	500VACrms for 1min	500VDC 10MΩ or more
Between thermocouple input channels	Transfer Isolation	1000VACrms for 1min	
Between cold junction compensation channel and programmable controller power supply	No Isolation	-	-

Notes:

1. The conversion speed indicates the maximum time from when the input temperature changes until the measured temperature value of buffer memory is batch-updated.
2. To satisfy with the accuracy, a warm-up (power distribution) period of 30 minutes is required.
3. Calculate the accuracy in the following method. (Accuracy) = (conversion accuracy) + (temperature characteristic) (operating ambient temperature variation) + (cold junction temperature compensation accuracy) An operating ambient temperature variation indicates a deviation of the operating ambient temperature from the 25 ±5°C range. Example: When using the thermocouple B (refer to User Manual) with the operating ambient temperature of 35°C and the measured temperature of 1000°C, the accuracy is as follows. (2.5°C)+(0.4) (35 -30 °C)+(1°C)= ±5.5°C
4. Dedicated cable and terminal block available; FA-CBL05Q68TDG and FA-LTB40TDG (non-stock)

MELSEC Q Series / iQ High Resolution Isolated Input Thermocouple Module



Thermocouple input modules are a specialized version of the more general-purpose analog input modules. These modules are designed to accept the specialized voltage signals generated by a wide variety of standard thermocouples. This allows the temperatures monitored by thermocouple sensors to be converted into digital values for use in CPU programs.

Key Features:

- Fully isolated inputs prevent interference between input signals
- Microvolt input capability for compatibility with load cell applications
- 16 bit resolution
- Module set-up via menus in GX Works2; no programming required
- 4 channels
- Supports K, E, J, T, B, R, S & N type thermocouples
- Set channel thermocouple type individually
- Disconnection detection
- Increase conversion speed by disabling unused channels
- Three data processing methods
- Offset/gain setting
- Out of range warning
- Pt100 cold junction compensation

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080141	Thermocouple Input Module Channel Isolated Thermocouple/Micro Voltage Input Module User's Manual Q64TD Q64TDV-GH GX Configurator-TI	Covers Q64TD, Q64TDV-GH & GX Configurator-TI	Supplied as PDF with GX Configurator-TI	-
IB(NA)080155	Thermocouple Input Module Channel Isolated Thermocouple/Micro Voltage Input Module User's Manual (Hardware) Q64TD, Q64TDV-GH	Basic information Q64TD, Q64TDV-GH	Yes	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Model Number		Q64TDV-GH
Stocked item		S
Certification		CE
Number of Channels		4 channels
Output	Temperature Conversion Value	16-bit, signed binary (-2700 to 18200: Value to the first decimal place x 10 times)
	Micro Voltage Conversion Value	16-bit, signed binary (-25000 to 25000)
	Scaling Value	16-bit, signed binary
Standard With Which Thermocouple Conforms		JIS C1602-1995
Usable Thermocouples		B, R, S, K, T, E, J, N
Cold Junction Temperature Compensation Accuracy		±1.0 °C
Micro Voltage Input Range		-100mV to +100mV (input resistance 2MΩ or more)
Micro Voltage Input Accuracy		±0.2mV (at 25°C ambient) ±0.8 mV (0-55°C ambient)
Resolution	Thermocouple Input	B: 0.7°C • R,S: 0.8°C • K,T: 0.3°C • E: 0.2°C • J: 0.1°C • N: 0.4°C
	Micro Voltage Input	4μV
Sampling Period		20ms/channel (*1)
Conversion Speed		Sampling period x 3 (*2)
Number of Analog Input Points		4 channels + Pt100 connection channel/module
Wire Break Detection		Yes (Each channel independent)
I/O Device Points Occupied		16 points
Connection Terminals		18-point terminal block
Applicable Crimping Terminals		R1.25-3 R1.25-3 (A solderless terminals with sleeves cannot be used)
Internal Current Consumption (5VDC)		0.50 A
Weight (kg)		0.25
Base Unit Slots Occupied		1

Notes:

1. A period until a thermocouple input value/micro voltage input value is converted into a temperature measurement micro/value voltage conversion value.
2. A period until a thermocouple input value/micro voltage input value is converted into a temperature measurement value/micro voltage conversion value and the resultant value is stored into the buffer memory. The conversion speed is a delay time that occurs during sampling processing. It is independent of averaging processing. Example: When two channels are enabled for conversion (Conversion speed) = (sampling period) x 3 = (20ms x 2 channels) x 3 = 120 ms.

MELSEC Q Series / iQ RTD Input Module

RTD input modules offer an alternative to thermocouple input modules. These work with platinum resistance temperature device (RTD) sensors. Note that RTD sensors are typically a narrower temperature range than that offered by thermocouples.

Key Features:

- Module set-up via menus in GX Works2; no programming required
- 4 channels
- Supports Pt100 & JPt100 devices
- Disconnection detection
- Increase conversion speed by disabling unused channels
- Three data processing methods
- Offset/gain setting
- Out of range warning

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080142	Thermocouple Input Module User's Manual	Covers Q64RD & GX Configurator-TI	Supplied as PDF with GX Configurator-TI	-
IB(NA)0800156	Thermocouple Input Module User's Manual (Hardware)	Basic information on Q64RD	Yes	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Model Number		Q64RD
Stocked Item		S
Certification		UL • cUL • CE
Number of Channels		4 channels
Output	Temperature Conversion Value	16-bit, signed binary data (-2000 to 8500: Value to the first decimal place x10 times); 32-bit, signed binary data (-200000 to 8500000: Value to the third decimal place x1000 times)
	Scaling Value	16-bit, signed binary
Usable Platinum Temperature-Measuring Resistors		Pt100 (JIS C1604-1997, IEC 751 1983), JPt100 (JIS C1604-1981)
Measured Temperature Range	Pt100	-200 to 850°C
	JPt100	-180 to 600°C
Range Changing	Pt100	-20 to 120°C / -200 to 850°C
	JPt100	-20 to 120°C / -180 to 600°C
Accuracy (*1)	Ambient Temperature 0 to 55°C	±0.25% (accuracy relative to full-scale value)
	Ambient Temperature 25 ± 5°C	±0.08% (accuracy relative to full-scale value)
Resolution		0.025°C
Conversion Speed		40ms/channel (*2)
Number of Analog Input Points		4 channels/module
Temperature Detecting Output Current		1mA
Wire Break Detection		Yes (each channel individually) (*3)
I/O Device Points Occupied		16 points
Connection Terminals		18-point terminal block
Applicable Crimping Terminals		1.25-3 R1.25-3 (Sleeved crimping terminals are not useable)
Internal Current Consumption (5VDC) (A)		0.60
Weight (kg)		0.17
Base Unit Slots Occupied		1

Notes:

1. The selection ranges and accuracies have the following relationships.

Ambient Temperature	Pt100 and JPt100 : -20 to 120°C	Pt100 : -200 to 850°C	JPt100 : -180 to 600°C
0 to 55°C	± 0.3°C	± 2.125°C	± 1.5°C
25 ± 5°C	± 0.096°C	± 0.68°C	± 0.48°C

2. The conversion speed is a period from when a temperature is input and converted into a corresponding digital value until the value is stored into the buffer memory. When two or more channels are used, the conversion speed is "40ms x number of conversion enabled channels".
3. At wire break detection, the temperature conversion value right before wire break occurrence is held.

Q Series / iQ Isolated RTD Input Modules

Model Number		Q64RD-G
Stocked Item		S
Certification		UL • cUL • CE
Number of Channels		4 channels
Output	Temperature Conversion Value	16-bit, signed binary data (-2000 to 8500: Value to the first decimal place x10 times); 32-bit, signed binary data (-200000 to 8500000: Value to the third decimal place x1000 times)
	Scaling Value	16-bit, signed binary
Usable Platinum Temperature-Measuring Resistors		Pt100 (JIS C1604-1997,IEC 751 1983), JPt100(JIS C1604-1981), Ni100Ω (DIN43760 1987)
Measured Temperature Range	Pt100	-200 to 850°C
	JPt100	-180 to 600°C
Range Changing	Pt100	-20 to 120°C /0 to -200°C / -200 to 850°C
	JPt100	-20 to 120°C /0 to -200°C / -180 to 600°C
Accuracy (*1) (Accuracy Relative to Maximum Value of Selection Range)	Pt100/JPt100 (-20 to 120 °C)	±70ppm/°C (±0.0070%/°C)
	Pt100/JPt100 (0 to 200°C)	±65ppm/°C (±0.0065%/°C)
	Pt100/JPt100 (-200 to 850°C)	±50ppm/°C (±0.0050%/ °C)
	Pt100/JPt100 (-60 to 180°C)	±70ppm/ °C (±0.0070%/ °C)
Resolution		0.025°C
Conversion Speed		40ms/channel (*2)
Number of Analog Input Points		4 channels/module
Isolation		See table below
Temperature Detecting Output Current		1mA
Wire Break Detection		Yes (each channel individually) (*3)
I/O Device Points Occupied		16 points
Connection Terminals		18-point terminal block
Applicable Crimping Terminals		1.25-3 R1.25-3 (Sleeved crimping terminals are not useable)
Internal Current Consumption (5VDC) (A)		0.62
Weight (kg)		0.20
Base Unit Slots Occupied		1

Specific Isolated Area	Isolation Method	Dielectric Withstand Voltage	Isolation Resistance
Between Temperature-Measuring Resistor Input and Programmable Controller Power Supply	Photocoupler Isolation	1780VrmsAC/ 3 cycles (Altitude 2000m)	10MΩ or more using 500VDC isolation resistance tester
Between Temperature-Measuring Resistor Input Channels	Transformer Isolation		

Notes:

1. The selection ranges and accuracies have the following relationships.

Ambient Temperature	Pt100 and JPt100 : -20 to 120°C	Pt100 : -200 to 850°C	JPt100 : -180 to 600°C
0 to 55°C	± 0.3°C	± 2.125°C	± 1.5°C
25 ± 5°C	± 0.096°C	± 0.68°C	± 0.48°C

2. The conversion speed is a period from when a temperature is input and converted into a corresponding digital value until the value is stored into the buffer memory. When two or more channels are used, the conversion speed is "40ms x number of conversion enabled channels".
3. For output in the case of disconnection detection, select any of "Value immediately before disconnection", "Up scale (maximum value of measured temperature range + 5% of measured temperature range)", "Down scale (minimum value of measured temperature range – 5% of measured temperature range)" or "Given value". Refer to User Manual.

Q Series / iQ Isolated RTD Input Modules

Model Number		Q68RD3-G
Stocked Item		S
Certification		UL • cUL • CE
Number of Channels		8 channels
Output	Temp. Conversion Value	16-bit, signed binary data (-2000 to 8500)
	Scaling Value	16-bit, signed binary
Usable Platinum Temperature-Measuring Resistors		Pt100 (JIS C1604-1997,IEC 751 1983), JPt100 (JIS C1604-1981), Ni100 (DIN43760 1987)
Measured Temperature Range	Pt100 (*1)	-200 to 850°C
	JPt100 (*1)	-180 to 600°C
	Ni100 (*1)	-60 to 180°C
Conversion Accuracy (*2)	Pt100 (-200 to 850°C) (*1)	±0.8°C (Ambient temperature: 25± 5°C), ±2.4°C (Ambient temperature: 0 to 55°C)
	Pt100 (-20 to 120°C) (*1)	±0.3°C (Ambient temperature: 25± 5°C), ±1.1°C (Ambient temperature: 0 to 55°C)
	Pt100 (0 to 200°C) (*1)	±0.4°C (Ambient temperature: 25± 5°C), ±1.2°C (Ambient temperature: 0 to 55°C)
	JPt100 (-180 to 600°C) (*1)	±0.8°C (Ambient temperature: 25± 5°C), ±2.4°C (Ambient temperature: 0 to 55°C)
	JPt100 (-20 to 120°C) (*1)	±0.3°C (Ambient temperature: 25± 5°C), ±1.1°C (Ambient temperature: 0 to 55°C)
	JPt100 (0 to 200°C) (*1)	±0.4°C (Ambient temperature: 25v 5°C),± 1.2°C (Ambient temperature: 0 to 55°C)
	Ni100 (-60 to 180°C) (*1)	±0.4°C (Ambient temperature: 25± 5°C), ±1.2°C (Ambient temperature: 0 to 55°C)
Resolution		0.1°C
Conversion Speed		320ms/8 channels (*3)
Number of Analog Input Points		8 channels

Isolation

Specific Isolated Area	Isolation Method	Dielectric Withstand Voltage	Isolation Resistance
Between RTD Input and Programmable Controller Power Supply	Transformer IsolatIon	500VACrms for 1min.	500VDC 10MΩ or more
Between RTD Input Channels		1000VACrms for 1min.	

Wire Break Detection	Yes (each channel individually) (*4)
I/O Device Points Occupied	16 points
Connection Terminals	40-pin connector
Internal Current Consumption (5VDC) (A)	0.54
Weight (kg)	0.20
Base Unit Slots Occupied	1

Notes:

1. The selection ranges and accuracies have the following relationships.

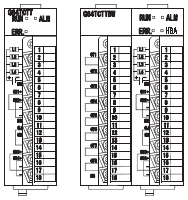
Ambient Temperature	Pt100 and JPt100 : -20 to 120°C	Pt100 : -200 to 850°C	JPt100 : -180 to 600°C
0 to 55°C	± 0.300°C	± 1.615°C	± 1.140°C
25 ± 5°C	± 0.090°C	± 0.533°C	± 0.390°C

Ambient Temperature	Pt100 and JPt100 : -0 to 200°C	Pt100 : -60 to 180°C
0 to 55°C	± 0.470°C	± 0.450°C
25 ± 5°C	± 0.145°C	± 0.135°C

2. Accuracy in ambient temperature and wire resistance when the offset/gain setting is set. Accuracy per 1-degree temperature change. Example: Accuracy for the case of changing from 25 to 30°C 0.04% (Reference accuracy) + 0.0070%/°C (Temperature coefficient) x 5°C (Temperature difference) = 0.075%
3. The conversion speed is a period from when a temperature is input and converted into a corresponding digital value until the value is stored into the buffer memory. When two or more channels are used, the conversion speed is “40ms x number of conversion enabled channels”.
4. For output in the case of disconnection detection, select any of “Value immediately before disconnection”, “Up scale (maximum value of measured temperature range + 5% of measured temperature range)”, “Down scale (minimum value of measured temperature range -5% of measured temperature range)” or “Given value”. Refer to User Manual.

MELSEC Q Series / iQ Temperature Control Modules

Temperature Controller modules are specialized modules that are intended for closed loop control of temperature in process control applications. They accept either thermocouple or RTD input devices. The modules incorporate programmable PID algorithms to allow the modules to maintain set temperatures independently of the CPU programs. The modules also provide outputs that operate under control of the PID algorithms to maintain control of heaters.



Key Features:

- Module set-up via menus in GX Works2; no programming required
- Auto-tuning PID capability simplifies configuration
- Four PID loops per module
- Reset Feedback (RFB) limiter to suppress overshooting at startup or an increase in set value
- Resolution of 0.1°C or 0.1°F
- Sensor disconnection detection on certain modules

Required Manuals

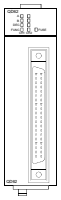
Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080989	Temperature Control Module User's Manual	Covers Q64TCTTN, Q64TCTTBWN, Q64TCRTN, Q64TCRTBWN & GX Configurator-TC	Supplied as PDF with GX Configurator-TC	-
IB(NA)0800120	Q64TCTT & Q64TCTTBW User's Manual (Hardware)	Basic information on Q64TCTT & Q64TCTTBW	Yes (Q64TCTT & Q64TCTTBW only)	-
IB(NA)0800121	Q64TCRT & Q64TCRTBW User's Manual (Hardware)	Basic information on Q64TCRT & Q64TCRTBW	Yes (Q64TCRT & Q64TCRTBW only)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Model Number		Q64TCTTN	Q64TCRTN	Q64TCTTBWN	Q64TCRTBWN
Stocked Item		S	-	-	-
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Control Output		Transistor output			
Number of Temperature Input Points		4 channels/module			
Usable Thermocouples/Platinum Temperature-Measuring Resistors		R, K, J, T, S, B, E, N, U, L, PLII, W5Re/W26Re	Pt100, JPt100	R, K, J, T, S, B, E, N, U, L, PLII, W5Re/W26Re	Pt100, JPt100
Accuracy	Ambient Temp. 25°C ± 5°C	Input range width x (±0.3%)			
	Ambient Temp. 0°C to 55°C	Input range width x (±0.7%)			
Cold Junction Temperature Accuracy Compensation	Ambient Temp. 0°C to 55°C	Within ±1.0°C	-	Within ±1.0°C	-
	Ambient Temp. -100°C to -150°C	Within ±2.0°C	-	Within ±2.0°C	-
	Ambient Temp. -150°C to -200°C	Within ±3.0°C	-	Within ±3.0°C	-
Sampling Period		0.5s/4 channels (constant independently of the number of channels used)			
Control Output Period		1 to 100s			
Input Impedance		1MΩ			
Input Filter		0 to 100s (0: Input filter off)			
Sensor Compensation Value Setting		-50.00 to 50.00%			
Operation at Sensor Input Disconnection		Upscale processing			
Temperature Control System		PID ON/OFF pulse or 2-position control			
PID Constant Range	PID Constant Setting	Setting can be made by auto tuning			
	Proportional Band (P)	0.0 to 1000.0% (0: 2-position control)			
	Integral Time (I)	0 to 3600s			
	Derivative Time (D)	0 to 3600s (set 0 for PI control)			
Dead Band Setting Range		0.1 to 10.0%			
Transistor Output	Output Signal	ON/OFF pulse			
	Rated Load Voltage	10 to 30VDC			
	Max. Load Current	0.1A/point, 0.4A/common			
	Max. Inrush Current	0.4A 10ms			
	Leakage Current at OFF	0.1mA or less			
	Max. Voltage Drop at ON	1.0VDC (TYP) 0.1A 2.5VDC (MAX) 0.1A			
	Response Time	OFF-ON : 2ms or less, ON-OFF : 2ms or less			
Heater Disconnection Detection Specs.	Current Sensor (*)	-		The following current sensors of URD, Ltd.: CTL-12-S36-8 (0.0 to 100.0A, CTL-6-P-H (0.00 to 20.00A)	
	Input Accuracy	-		Input range width (±1.0%)	
	Number of Alert Delays	-		3 to 255	
Number of Occupied I/O Points		16 points/slot (I/O assignment: 16 intelligent points)		32 points/2 slots (Default I/O assignment: 16 free points + 16 intelligent points)	
Connection Terminal		18-point terminal block		Two 18-point terminal blocks	
Applicable Crimping Terminal		R1.25-3, 1.25-YS3, RAV1.25-3, V1.25-YS3A			
Internal Current Consumption (A)		0.29		0.33	
Weight (kg)		0.20		0.30	
Base Unit Slots Occupied		1			

Note: Use only URD's current sensors. In North America contact URD via www.urdamerica.com

MELSEC Q Series / iQ High Speed Counter Modules



These modules provide a capability for the CPUs to sense high frequency pulse trains as would be found in motion control and similar applications. Typically these modules would be linked to encoders to provide a closed loop of position sensing on a motion axis.

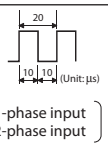
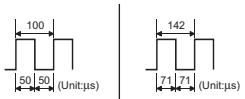
Key Features:

- Module set-up via menus in GX Works2; no programming required
- External selection of count function capability
- Up to 0.5MHz count frequency (depending on model)
- 32 bit count range
- Single phase & quadrature input
- Preset count functions (linear, ring, sample, periodic)
- Built-in outputs for direct actuation of external processes
- CW/CCW detection

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080036	High Speed Counter Module User's Manual	Covers QD62, QD62E, QD62D & GX Configurator-CT	Supplied as PDF with GX	-
IB(NA)0800059	High Speed Counter Module User's Manual (Hardware)	Basic information on QD62, QD62E, QD62D	Yes	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Model Number		QD62-H01	QD62-H02
Stocked Item		-	-
Certification		UL • cUL • CE	
Number of Occupied I/O point		16 I/O points	
Number of Channels		2 channels	
Count Input Signal	Phase	1-phase input, 2-phase input	
	ON / OFF Characteristics	5/12/24VDC, 2 to 5mA	
Counter	Counting Speed (Max) (*1)	1-phase input 50kPPS; 2-phase input 50kPPS	1-phase input 10kPPS; 2-phase input 7kPPS
	Counting Range	32-bit signed binary (-2147483648 to 2147483647)	
	Type	UP/DOWN Preset counter + Ring counter function	
	Minimum Count Pulse Width (Duty Ratio 50%)	 1-phase input 2-phase input	 (1-phase input) (2-phase input)
External Input	Rated Input Voltage	5/12/24VDC, 2 to 5mA	
	ON / OFF Characteristics		
Comparison Output	Comparison Range	32-bit signed binary	
	Comparison System	Setting value < Count value Setting value = Count value Setting value > Count value	
	Number of Points	2 points/channel	
	Output Rating	Transistor (sink type)	
	External Supply Power	12/24VDC 0.5A/point; 2A/common	
I/O Device Points Occupied		16 points (I/O assignment: Intelligent 16 points)	
5VDC Internal Current Consumption (A)		0.30	
Weight (kg)		0.11	
Base Unit Slots Occupied		1	

Note:

1. Counting speed is affected by pulse rise and fall time. Possible counting speeds are shown in the following table. Note that a miscount may occur if the D62-H01 counts a pulse larger than t=50µs. In this case, use the QD62-H02.

MELSEC Q Series / iQ High Speed Counter Modules

Model Number		QD62	QD62E	QD62D	QD63P6
Stocked Item		S	S	S	-
Certification		UL • cUL • CE			
Compatible Encoder Types (*2) (*3)		Open collector type/CMOS	Open collector type/CMOS	Line driver type	Open collector type/CMOS
Counting Speed Switch Setting		200k (100k to 200kPPS) 100k (10k to 100kPPS) 10k (10kPPS max.)		500k (200k to 500kPPS) 200k (100k to 200kPPS) 100k (10k to 100kPPS) 10k (10kPPS max.)	200k (100k to 200kPPS) 100k (10k to 100kPPS) 10k (10kPPS max.)
Number of Channels		2 channels			6 channels
Count Input Signal	Phase	1 phase input, 2 phase input			
	Rated Input Voltage	5/12/24VDC (positive or negative common)		EIA Standard RS-422-A Differential line driver level (*1)	6.4 to 11.5 mA at 5VDC
	ON / OFF Characteristics	5/12/24V; 2 to 5mA			
	Counting Range	32-bit designated binary (-2147483648 to 2147483647)			
	Type	UP/DOWN preset counter + ring counter functions			
External Input	Rated Input Voltage	5/12/24VDC (positive or negative common)		5/12/24V (*2)	5V
	ON / OFF Characteristics	5/12/24V; 2 to 5mA			6.4 to 11.5mA
Comparison Output	Comparison Range	32-bit designated binary (-2147483648 to 2147483647)			
	Comparison System	Set value < count value, set value = count value, set value>count value			
	Number of Points	2 points/channel			Internal I/O
	Output Rating	Transistor (Sink) 12/24VDC 0.5A/point 2A/common	Transistor (Source) 12/24VDC 0.1A/point 0.4A/common	Transistor (Sink) 12/24VDC 0.5A/point 2A/common	-
	External Supply Power	Voltage range: 10.2 to 30V, current consumption: 8mA (typ @24VDC)			-
I/O Device Points Occupied		16 points (I/O assignment: 16 intelligent points)			32 points (I/O assignment: 32 intelligent points)
5VDC Internal Current Consumption (A)		0.30	0.33	0.38	0.59
Weight (kg)		0.11		0.12	0.15
Base Unit Slots Occupied		1			

Notes:

1. Japan Texas Instruments product model Am26LS31 or equivalent.
2. Insure encoder output voltages are compatible with the module's input specifications.
3. TLL output type encoders cannot be used with the QD62, QD62E, and QD62D.

MELSEC Q Series / iQ High Speed Counter Modules

QD62-H01

Counting Speed Switch Setting	1 Phase Input	2-Phase Input
t=5µs or less	50PPS	
t=50µs	5kPPS	
t=500µs	-	

QD62-H02

Counting Speed Switch Setting	1 Phase Input	2-Phase Input
t=5µs or less	10kPPS	7kPPS
t=50µs	-	
t=500µs	500PPS	250PPS

QD62

Counting Speed Switch Setting	200kPPS	100kPPS	10kPPS
Rise/Fall time	Both Phases 1 and 2		
t=1.25µs or less	200kPPS	100kPPS	10kPPS
t=2.5µs or less	100kPPS	100kPPS	10kPPS
t=25µs or less	-	10kPPS	10kPPS
t=500µs	-	-	500PPS

QD62E

Counting Speed Switch Setting	200kPPS	100kPPS	10kPPS
Rise/Fall time	Both Phases 1 and 2		
t=1.25µs or less	200kPPS	100kPPS	10kPPS
t=2.5µs or less	100kPPS	100kPPS	10kPPS
t=25µs or less	-	10kPPS	10kPPS
t=500µs	-	-	500PPS

QD62D

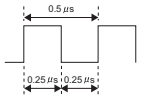
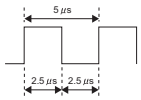
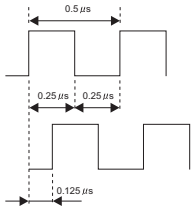
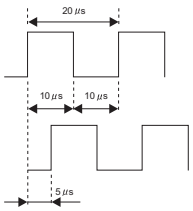
Counting Speed Switch Setting	500kPPS	200kPPS	100kPPS	10kPPS
Rise/Fall time	Both Phases 1 and 2			
t=0.5µs or less	500kPPS	200kPPS	100kPPS	10kPPS
t=1.25µs or less	200kPPS	200kPPS	100kPPS	10kPPS
t=2.5µs or less	-	100kPPS	100kPPS	10kPPS
t=25µs or less	-	-	10kPPS	10kPPS
t=500µs	-	-	-	500PPS

Note: Inputting a waveform with a long rise/fall time may cause a false input. Use a waveform within the permissible rise/fall time.

QD63P6

Counting Speed Switch Setting	200kPPS	100kPPS	10kPPS
Rise/Fall time	Both Phases 1 and 2		
t=1.25µs or less	200kPPS	100kPPS	10kPPS
t=2.5µs or less	100kPPS	100kPPS	10kPPS
t=25µs or less	-	10kPPS	10kPPS
t=500µs	-	-	500PPS

MELSEC Q Series / iQ Multi-Function Counter/Timer Module

Model Number		QD65PD2	
		Differential input	DC Input
Stocked Item		S	
Certification		UL • cUL • CE	
Number of Occupied I/O Point		32 points (I/O assignment: Intelligent, 32 points)	
Number of Channels		2 channels	
Counting Speed Switch Setting (*1)	1 Multiple	10kpps/100kpps/200kpps/500kpps/ 1Mpps/2Mpps	10kpps/100kpps/200kpps
	2 Multiples	10kpps/100kpps/200kpps/500kpps/ 1Mpps/2Mpps/4Mpps	
	4 Multiples	10kpps/100kpps/200kpps/500kpps/ 1Mpps/2Mpps/ 4Mpps/8Mpps	
Count Input Signal	Phase	1-phase input (1 multiple/2 multiples), 2-phase input (1 multiple/2 multiples/4 multiples), CW/CCW	
	Signal Level (øA, øB)	EIA Standards RS-422-A, differential line driver level (AM26LS31 [manufactured by Texas Instruments] or equivalent)	5/12/24VDC, 7 to 10mA
Counter	Counting Speed (Max) (*2, *3)	8Mpps (4 multiples of 2 phases)	200kpps
	Counting Range	32-bit signed binary (-2147483648 to 2147483647)	
	Format	Count, subtraction count; Linear counter format, ring counter format; Preset/replace function, latch counter function	
	Minimum Count Pulse Width (Duty Ratio 50%)	1-phase input (1 multiple/2 multiples), CW/CCW  (Minimum pulse width in 2 multiples of 1 phase: 0.25µs)	1-phase input (1 multiple/2 multiples), CW/CCW  (Minimum pulse width in 2 multiples of 1 phase: 2.5µs)
		2-phase input (1 multiple/2 multiples/4 multiples)  (Minimum pulse width in 4 multiples of 2 phases: 0.125µs)	2-phase input (1 multiple/2 multiples/4 multiples)  (Minimum pulse width in 4 multiples of 2 phases: 5µs)
Comparison Output	Comparison Range	32-bit signed binary	
	Comparison System	Setting value < Count value; Setting value = Count value; Setting value > Count value	
	In-Range Output	Setting value (lower limit value) ≤ Count value ≤ Setting value (upper limit value)	
	Not-In-Range Output	Count value < Setting value (lower limit value), Setting value (upper limit value) < Count value	
	Interrupt	Equipped with a coincidence detection interrupt function	
External Input	Phase Z	EIA Standards RS-422-A, differential line driver level (AM26LS31 [manufactured by Texas Instruments] or equivalent): 2 points	5/12/24VDC, 7 to 10mA: 2 points
	Function	5/12/24VDC, 7 to 10mA: 2 points	
	Latch Counter	5/12/24VDC, 7 to 10mA: 2 points	
	General Input	24 VDC, High Speed: 7 to 10mA, 2 points, Low Speed: 3mA, 4 points	
External Output	Coincidence Output (High Speed)	Transistor (sink type) output: 2 points 12/24VDC 0.1A/point, 0.8A/common	
	Coincidence output (Low Speed)	Transistor (sink type) output: 6 points 12/24VDC 0.1A/point, 0.8A/common	
	General Output	Transistor (sink type) output: 8 points 12/24VDC 0.1A/point, 0.8A/common	
Pulse Measurement	Measurement Item	Pulse width (ON width/OFF width)	
	Measurement Resolution	100ns	
	Measurement Points	2 points/channel	
Cam Switch	Number of Output Points	8 points (max. 16 steps/point)	
	Control Cycle	1ms	
	Difference Between Each Output Duration in a Channel	100µs or less	
PWM Output Frequency Range	Coincidence Output (High Speed)	DC and up to 200kHz	
	Coincidence Output (Low Speed)	DC and up to 2kHz	
	Duty Ratio	Any ratio (Can be set by 0.1µs)	
5VDC Internal Current Consumption (A)		0.23	
Applicable Wire Size		0.3mm² (22 AWG) (A6CON1 and A6CON4), 0.088mm² to 0.24mm² (24 to 28 AWG) (A6CON2)	
Applicable Connector for External Wiring (Sold Separately)		A6CON1, A6CON2, A6CON4	
External Dimensions (H x W x D) mm		98 x 27.4 x 90	
Weight (kg)		0.15	
Base Unit Slots Occupied		1	

Notes:

1. Counting speed switch setting can be done using the switch setting.
2. Note that the count may be done incorrectly by inputting pulses whose phase difference is small between the phase A pulse and phase B pulse. To check the input waveform of the phase A pulse and phase B pulse, or to check phase difference between the phase A pulse and phase B pulse, refer to User's Manual
3. The counting speed is affected by the pulse rise/fall time. The number of pulses that can be counted depending on the counting speed is listed below. Note that the count may be done incorrectly by counting pulses with long rise/fall time.

MELSEC Q Series / iQ Interrupt Modules

Although Q Series I/O modules are designed to offer very fast responses to input signals, some applications need a shorter response than these modules can offer. In these cases, use the QI60 interrupt module. This offers response times as rapid as 50 microseconds for very fast event capture. For more sophisticated applications, the QD60P8-G offers isolated input capability together with averaging, scaling and sampling functions.

Key Features:

- 16 input points
- Response time adjustable over the range 0.05ms to 1ms
- 24VDC positive common connection

Required manuals:

The QI60 is covered in the Q Series CPU manuals

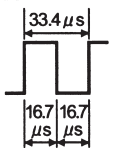
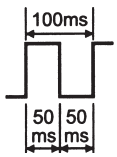
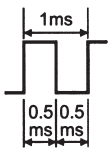
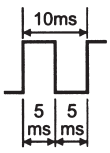
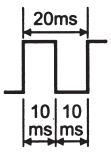
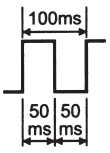
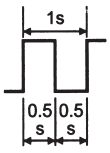
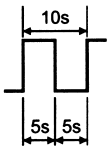
Model Number			QI60				
Stocked Item			S				
Certification			UL • cUL • CE				
Number of Input Points			16 points				
Rated Input Voltage			24VDC (+20/-15%, ripple ratio within 5%)				
Rated Input Current			Approx. 6mA				
ON Voltage/ON Current			19V or higher/3mA or higher				
OFF Voltage/OFF Current			11V or lower/1.7mA or lower				
Response Time (ms)	Set Value (*)		0.1	0.2	0.4	0.6	1
	ON-OFF	Typ	0.05	0.15	0.30	0.55	1.05
		Max	0.10	0.20	0.40	0.60	1.20
	OFF-ON	Typ	0.15	0.20	0.35	0.60	1.10
		Max	0.20	0.30	0.50	0.70	1.30
Common Terminal Arrangement			16 points/common (common terminal: TB17)				
I/O Device Points Occupied			16 points				
External Connections			18-point terminal block (M3 x 6 screws)				
Applicable Crimping Terminal			R1.25-3 (sleeved crimping terminals cannot be used)				
5VDC Internal Current Consumption (mA)			60 (TYP. all points ON)				
Weight (kg)			0.20				
Base Unit Slots Occupied			1				

Note: Set via software.

Isolated Interrupt Module

Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080313	Channel Isolated Pulse Input Module (QD60P8-G) User's Manual	Covers QD60P8-G	Supplied as a PDF with GX Configurator-CT	-
IB(NA)0800229	Channel Isolated Pulse Input Module User's Manual (Hardware) QD60P8-G	Basic information on QD60P8-G	Yes	-

Model Number		QD60P8-G							
Stocked Item		S							
Certification		CE							
Counting Speed Switch Settings		30kpps	10kpps	1kpps	100pps	50pps	10pps	1pps	0.1pps
Number of Channels		8 channels							
Count Input Signal	Phase	1-phase input							
	Signal Level	5VDC / 12 to 24VDC							
Counter	Counting Speed (Max.)	30kpps	10kpps	1kpps	100pps	50pps	10pps	1pps	0.1pps
	Count Range	Sampling pulse number: 16-bits binary values (0 to 32767); Accumulating count value: 32-bits binary values (0 to 99999999) Input pulse value: 32-bits binary values (0 to 2147483647)							
	Count Type	Linear counter method, Ring counter method							
	Minimum Count Pulse Width (Duty Ratio 50%)								
Connected Terminal		18 points terminal block							
I/O Device Points Occupied		32 points							
Applicable Solderless Terminals		R1.25-3 (A solderless terminals with sleeves cannot be used)							
Internal Current Consumption (5VDC)		0.58A							
Weight (kg)		0.17							
Base Unit Slots Occupied		1							

* Counting speed is affected by pulse rise and fall time. Note that if a pulse that has a large rise and/or fall time is counted, a miscount may occur.

MELSEC Q Series / iQ Positioning Modules

One of Q Series' strengths is the ability to integrate positioning directly onto your system. If a Q Series motion CPU is not required, the following modules provide a range of alternative positioning control capabilities in a range of formats.

Key Features:

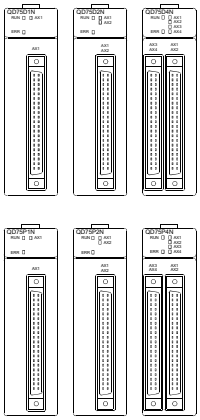
- Module set-up via menus in GX Works2; no programming required
- One, two and four axis versions available
- Open collector, differential driver and SSCNET versions available
- 4MHz output capability
- 4 axis linear interpolation
- Circular interpolation
- Variety of control schemes (point to point, fixed feed, speed, speed/position and position/speed)

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080172	GX Configurator-QP Version 2 Operating Manual	Covers GX Configurator-QP for all Q Series motion control modules (P/D/M)	Supplied as PDF with GX Configurator-QP	-
IB(NA)0800063	QD75P/D1N, 2N & 4N Users' Manual (Hardware)	Basic information on QD75P/D1, 2 & 4	Supplied with QD75P/D1, 2 & 4	-
SH(NA)080058	QD75PN/QD75DN Positioning Module User's Manual	Covers QD75P/D 1, 2 & 4	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

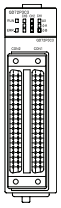
MELSEC Q Series / iQ Positioning Control Modules



Model Number		QD75P1N (*1) • QD75D1N	QD75P2N (*1) • QD75D2N	QD75P4N (*1) • QD75D4N
Stocked Item		-	S	S
Number of Control Axes		1 axis	2 axes	4 axes
Interpolation Function		No	2-axis linear interpolation; 2-axis circular interpolation	2-, 3-, or 4-axis linear interpolation 2-axis circular interpolation
Control Unit		mm, inch, degree, pulse		
Backup		Parameters, positioning data, and block start data can be saved on flash ROM (battery-less backup).		
Positioning	Positioning System	PTP control: Incremental system/absolute system Speed-position switching control: Incremental system/absolute system (*2) Position-speed switching control: Incremental system Path control: Incremental system/absolute system		
	Position Range	In absolute system • -214748364.8 to 214748364.7(m) • -21474.83648 to 21474.83647(inch) • 0 to 359.99999(degree) • -2147483648 to 2147483647(pulse) In incremental system • -214748364.8 to 214748364.7(m) • -21474.83648 to 21474.83647(inch) • -21474.83648 to 21474.83647(degree) • -2147483648 to 2147483647(pulse) In speed-position switching control (INC mode) / position-speed switching control • 0 to 214748364.7(m) • 0 to 21474.83647(inch) • 0 to 21474.83647(degree) • 0 to 2147483647(pulse) In speed-position switching control (ABS mode) • 0 to 359.99999(degree)		
	Speed Command	0.01 to 40000000.00(mm/min); 0.001 to 2000000.000(inch/min); 0.001 to 2000000.000(degree/min); 1 to 4000000(pulse/s)		
	Acceleration/Deceleration Process	Automatic trapezoidal acceleration/deceleration, S-pattern acceleration/deceleration		
	Acceleration/Deceleration Time	1 to 8388608 (ms) Four patterns can be set for each of acceleration time and deceleration time		
	Sudden Stop Deceleration Time	1 to 8388608 (ms)		
Protective Degree		IP2X		
External Wiring Connection System		40-pin connector		
Applicable Wire Size		0.3mm² (AWG#22) or less (for A6CON1, A6CON4), AWG #24 (for A6CON2)		
Applicable Connector for External Devices		A6CON1, A6CON2, A6CON4 (Sold separately)		
Max. Output Pulse		QD75D1N, QD75D2N, QD75D4N: 4Mpps		
Max. Connection Distance Between Servos		QD75P1, QD75P2, QD75P4: 2m; QD75D1, QD75D2,QD75D4: 10m		
Online Module Change		Disabled		
I/O Device Points Occupied		32 points/slot (I/O assignment: intelligent)		
5VDC Internal Current Consumption		QD75P1N: 0.29A QD75D1N: 0.43A	QD75P2N: 0.30A QD75D2N: 0.45A	QD75P4N: 0.36A QD75D4N: 0.66A
Weight (kg)		0.15	0.15	0.16
Base Unit Slots Occupied		1		

Notes:

1. QD75P represents the open-collector output system, and QD75D represents the differential driver output system.
2. In speed-position switching control (ABS mode), the control unit available is "degree" only.



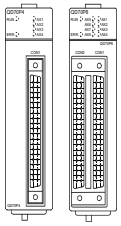
MELSEC Q Series / iQ Positioning Module with Built-in Counter Function

Model Number		QD72P3C3
Stocked Item		-
Certification		UL • cUL • CE
Number of Control Axes		3 axes
Interpolation Function		No (Artificial linear interpolation by concurrent start is available.)
Control Unit		Pulse
Backup		No
Positioning	Positioning System	PTP (Point to Point) control, speed control
	Position Range	-1073741824 to 1073741823 pulses
	Speed Command	1 to 100000 pulses/s (*1)
	Acceleration/Deceleration Process	Trapezoidal acceleration/deceleration
	Acceleration/Deceleration Time	1 to 5000 ms
External Wiring Connection System		40-pin connector
Applicable Connector for External Devices		A6CON1, A6CON2, A6CON4 (Sold separately)
Max. Output Pulse		100 kpps
I/O Device Points Occupied		32 points
5VDC Internal Current Consumption (A)		0.57
Weight (kg)		0.16
Base Unit Slots Occupied		1

Note:

1. 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.

MELSEC Q Series / iQ Basic Positioning Control Modules



For applications not requiring the level of sophistication offered by our QD75P/D/M modules, consider the QD70P4 & P8 modules. These modules offer four and eight axis control from a single module. All basic motion control capabilities for non-coordinated axes are offered.

Key Features:

- Module set-up via menus in GX Works2; no programming required
- Multiple axes controlled by a single module to minimize slot occupancy on the rack
- Multiple modules may be installed on a Q Series rack, giving control over dozens of axes
- Start 8 axes simultaneously, with very short (0.1ms) delay
- Variety of axis control schemes (point to point, speed/position switching control)

Required Manuals

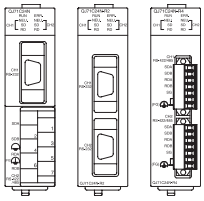
Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080171	QD70 Positioning Module User's Manual	Covers QD70P4, QD70P8 & GX Configurator-PT	Included with GX Configurator PT as PDF	-
IB(NA)0800169	QD70P User's Manual (Hardware)	Basic information on QD70P4 & QD70P8	Supplied with QD70P4 & P8	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Model Number		QD70P4	QD70P8
Stocked Item		S	S
Certification		UL • cUL • CE	UL • cUL • CE
No. of Control Axes		4 axes	8 axes
Interpolation Function		No	
Control Method		PTP (Point To Point) control, path control (linear only), speed-position switching control	
Control Unit		Pulse	
Data Backup		No	
Positioning Control	Positioning Control Method	PTP control : Incremental system/absolute system Speed-position switching control : Incremental system Path control : Incremental system/absolute system	
	Positioning Control Range	Absolute system: -2147483648 to 2147483647 (pulse) Incremental system: -2147483648 to 2147483647 (pulse) Speed-position switching control: 0 to 2147483647 (pulse)	
	Speed Command	0 to 200000 (pulse/s)	
	Acceleration/Deceleration Processing	Trapezoidal acceleration/deceleration	
	Accel./Decel. Time	0 to 32767 (ms)	
External Device Connection Connector		A6CON1, A6CON2 (option), A6CON4	
Pulse Output Method		Open collector output	
Max. Output Pulse		200kpps	
Max. Connection Distance Between QD70 and Drive Unit		2m (6.56 feet)	
Internal Current Consumption (5VDC)		0.55A	0.74A
External 24V Current Consumption (24VDC)		0.065A	0.12A
I/O Device Points Occupied		32 points (I/O assignment: Intelligent function module 32 points)	
Weight (kg)		0.15	0.17
Base Unit Slots Occupied		1	

MELSEC Q Series / iQ Serial Communication Modules

Serial communication modules provide a way to link the Q Series system to third party systems that offer standard serial RS-232 or RS-422/485 communication ports. Examples of typical connections include modems, scales, bar code readers, printers and marquee displays. The modules can be regarded as communication co-processors, as they support a variety of dedicated communication functions that are accessed via special CPU instructions. These functions reduce the amount of specialist communications programming required.



Key Features:

- Module set up via software without programming
- Many pre-made protocols built-in to the configuration software
- Protocol function block allows complex communication protocols to be configured without any programming. Library of preset function blocks available to communicate with third party devices
- Debugging function allows communication signals to be monitored and packet data to be examined
- 230,400 bps communication speed; run both serial ports on the module at 115,200 bps simultaneously
- Use as a duplicate CPU programming port (offers full CPU port capabilities, including program upload/ download, device monitoring, etc)
- Use preset MC (MELSEC Communications) or user defined protocols
- Two communications ports per module, each operable independently
- Remote system management & maintenance via third party modems
- Multi-drop communications between multiple systems via RS-422/485 ports
- Available with two RS-232 ports, or RS-232 + RS-422/485 ports

Note: The Q Series Ethernet communication modules (QJ71E71, QJ71E71-B2 & QJ71E71-100) also use the MC protocol.

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800008	Serial Communication Module User's Manual (Hardware)	Basic information on QJ71C24N & QJ71C24N-R2 modules	Supplied with QJ71C24N & QJ71C24N-R2	-
SH(NA)080006	Q Corresponding Serial Communication Module User's Manual (Basic)	Covers basic programming information for QJ71C24N, QJ71C24N-R2 & GX Configurator-SC	Included with GX Configurator-SC as PDF	-
SH(NA)080007	Q Corresponding Serial Communication Module User's Manual (Application)	Covers using the QJ71C24N & QJ71C24N-R2 module in various practical applications	No (purchase separately)	-
SH(NA)080008	Q Corresponding MELSEC Communication Protocol Reference Manual	Reference guide to the MC Protocol used by the QJ71C24N & QJ71C24N-R2 (and also used by Q Series Ethernet modules)	No (purchase separately)	-
SH(NA)080393	GX Configurator-SC Version 2 Operating Manual	Guide to using the GX Configurator-SC utility software	Included with GX Configurator-SC	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Serial Communication Modules

Model Number		QJ71C24N	QJ71C24N-R2	QJ71C24N-R4
Stocked Item		S	S	S
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Interface	CH1	RS-232-compliance (D-sub 9P)	RS-232-compliance (D-sub 9P)	RS-422/485-compliance (2-piece plug-in connector socket block)
	CH2	RS-422/485-compliance (2-piece terminal block)	RS-232-compliance (D-sub 9P)	RS-422/485-compliance (2-piece plug-in connector socket block)
Communication Method		Full duplex communication/half duplex communication		
Synchronization Method		Start-up synchronization method		
Transmission Speed		50 / 300 / 600 / 1200 / 2400 / 4800 / 9600 / 14400 / 19200 / 28800 / 38400 / 57600 / 115200 / 230400 • Transmission speed 230400 bps is available for only CH1. (Not available for CH2) • Total transmission speed of two interfaces is available up to 230400 bps. • Transmission speed of up to 115200 bps for each interface is available when two interface are used simultaneously.		
Data Format	Start Bit	1		
	Data Bit	7/8		
	Parity Bit	1 (vertical parity) or none		
	Stop Bit	1/2		
Access Cycle	MC Protocol Communication	Processes one request during installed PLC CPU END processing. Number of scans that must be processed/number of link scans depends on the contents of the request.		
	Nonprocedural Protocol Communication Bidirectional Protocol Communication	Sends each time a send request is issued. Can receive at any time.		
Error Detection	Parity Check	For all protocol, select odd/even by the parameter when there is an error.		
	Sum Check Code	Select by the parameter for MC protocol/Bidirectional protocol. Select by the user frame for non-procedure protocol.		
Transmission Control		DTR/DSR (ER/DR) Control: RS-232 •, RS-422/485 - RS/CS Control: RS-232 •, RS-422/485 - CD Signal Control: RS-232 •, RS-422/485 - DC1/DC3 (Xon/Xoff) Control, DC2/DC4 Control: RS-232 •, RS-422/485 • • DTR/DSR signal control and DC code control are selected by the user.		
Line Configuration	RS-232	1:1	1:1	-
	RS-422/485	1:1, 1:n, n:1, m:n	-	1:1, 1:n, n:1, m:n
Max. Transmission Distance (Overall Distance)	RS-232	15m (49.2 ft.)	15m (49.2 ft.)	-
	RS-422/485	1200m (4592.4 ft.) (overall distance)	-	1200m (4592.4 ft.) (overall distance)
I/O Device Points Occupied		32 points per slot (I/O assignment: Intelli: 32 points)		
Applicable Connector for External Wiring		9 pin D-sub (male) screw type		-
5VDC Internal Current Consumption		0.31A	0.26A	0.39A
Weight kg (lbs)		0.20 (0.44)		
Base Unit Slots Occupied		1		

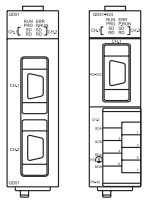
Compatible Modem Specifications

Telephone Line	Public Line/Private Line/Cellular Phone	ISDN
Connection Line	Analog 2-wire type	ISDN line
Initialization	Hayes AT command-compatible product	Hayes AT command-compatible product
Communication Standard	V.34/V.32bis/V.32/V.22bis/V.22/V.21V.fc, 212A/103	V.110 (B-channel circuit exchange, D-channel packet switching)
Error Correction	Class 4, class 10 compatible, V.42 compatible	
Data compression	Class 5 compatible, V.42bis compatible	
Others	Should be able to exercise flow control (RS/CS control) and have independent control of DR (DSR) signal.	

* When using a cellular phone, it is recommended to use a modem whose error correction function supports MNP class 10.
Note that communications may not be made depending on the line status.

MELSEC Q Series / iQ Intelligent Communication Modules

The modules offer a higher-level alternative to the QJ71C24 & QJ71C24-R2. The QD51 & QD51-R24 can run their own BASIC programs, allowing complex communications based tasks to be handled separately of the other CPUs on a Q Series system.



Key Features:

- Runs AD51H-BASIC
- Can run two tasks simultaneously
- Can use external hard disks of connected peripherals
- Range of communications options supported

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800130	QD51/QD51-R24 Corresponding Intelligent Communications Module User's Manual (Hardware)	Basic information on QD51 & QD51-R24	Supplied with QD51 & QD51-R24	-
SH(NA)080089	Q Corresponding Intelligent Communication Module User's Manual	Covers the QD51 & QD51-R24	No (purchase separately)	-
SH(NA)080090	AD51H-BASIC Programming Manual (Command Manual)	Covers AD51H-BASIC commands	No (purchase separately)	-
SH(NA)080091	AD51H-BASIC Programming Manual (Program Manual, Compilation Manual)	Covers debugging, multi-tasking & compilation features of AD51H-BASIC	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

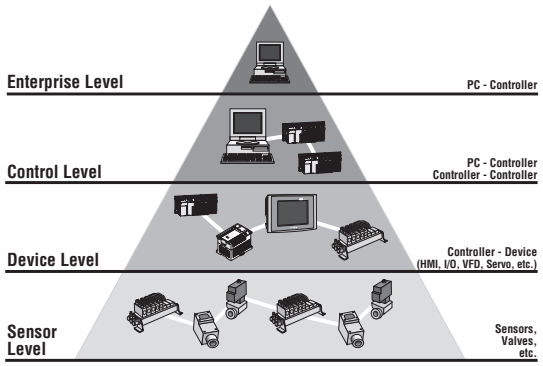
Model Number	QD51	QD51-R24
Stocked Item	-	
Programming Language	AD51H-BASIC	
Internal Memory	Program memory: 64k bytes/2 tasks (Capacity of task 1 + capacity of task 2 ≤ 64k bytes); Common memory: 8k bytes; Buffer memory: 6k bytes; Expanded register: 1024 points (2k bytes); Expanded relay: 1024 points	
I/O to / From PLC CPU	Input 26 points, output 23 points	
Memory Protection	Yes, (Flash ROM write protectable)	
Communication Port	QD51 : RS-232 2ch; QD51-R24 : RS-232 1ch, RS-422/485 1ch	
Communication System	Full-duplex	
Synchronization System	Synchronous	
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400; Usable when the total transmission speed of two channels is within 38400bps.	
Data Format	Start bit: 1; Data bit: 7 or 8; Parity bit: Even, odd, none; Stop bit: 1 or 2	
Transmission Control	DTR/DSR (ER/DR) control: Available for RS-232 only; RS/CS control: Available for RS-232 only; CD signal control: No; DC1/DC3 (Xon/Xoff) control: Yes; DC2/DC4 control: No	
Clock Function	No	
Power Failure Compensation	No	
Storage of User Program onto ROM	No (only program area data is stored onto flash ROM)	
Console	IBM PC/AT personal computer	
Multi-Task Debugging	Possible (using debugger)	
Line Configuration	RS-232:1:1; RS-422/485:1:1, 1:n, n:1, m:n	
Transmission Distance	RS-232: Max. 15m (49.18 ft.); RS-422/485: Max. 1200m (3934.43 ft.) (overall distance)	
I/O Device Points Occupied	32 points (1 slot occupied) (I/O assignment: Intelligent)	
Internal Current Consumption (5VDC) (A)	0.26	0.31
Weight (kg)	0.2	
Base Unit Slots Occupied	1	

Overview of Networks

When choosing a network solution a number of criteria may come into play. Topology, bus speed, communications distance, redundancy, data transfer capabilities, the number of nodes the network can support, deterministic capabilities, cost, ease-of-use, third party support to name just a few.

But most importantly, will it work well within your specific application? When developing our family of network products, we've taken all these factors into consideration - assuring users, all the necessary features and capabilities are packaged into the network product they have selected.

From top to bottom in the network hierarchy, from open architecture protocols to seamless engineered systems, from sensor to enterprise level, we offer a host of powerful network solutions for users to choose from. The one common denominator with all Mitsubishi Electric network products is unmatched performance. In relative performance data comparisons, all our network solutions meet, exceed or dramatically outperform most competitive networks available on the global market today.



While bus speed is a critical factor in measuring performance, there are several other reasons why Mitsubishi Electric network solutions excel over others. Easy connectivity, seamless integration, synergistic performance characteristics of a Mitsubishi Electric controlled network and above all else - maximum levels of uptime without sacrificing performance or productivity. Whether you have an entire factory floor or just an individual machine to network, you'll find Mitsubishi Electric's expansive range of network options to be the superior choice.

Enterprise Level

Specifications	Ethernet (100base-TX)	Ethernet (10base-T)	Ethernet (10base-5)	Ethernet (10base-2)
Network Level	Enterprise	Enterprise	Enterprise	Enterprise
Architecture	Star (via hub)	Star (via hub)	Bus	Bus
Communications Media	Cat. 5 (UTP/STP)	Cat. 5 (UTP/STP)	via AUI transceiver	Coax
Transmission Speed	100Mbit/s	10Mbit/s	10Mbit/s	10Mbit/s
Number of Stations	Two levels of cascade connections via hubs	Four levels of cascade connections via hubs	100/segment	30/segment
Maximum Distance (m)	100/segment	100/segment	500/segment	185/segment
Remote I/O	N/A	N/A	N/A	N/A

Control Level

Specifications	CC-Link IE Control	CC-Link IE Field	MELSECNET/H
Network Level	Control	Control and Device	Control
Architecture	Loop	Bus/Loop/Star (via hub)	Bus/Loop
Communications Media	Fiber	Cat. 5	Fiber/Coax
Transmission Speed	1Gbit/s	1 Gbit/s	10/25Mbit/s (depends on module used)
Number of Stations	120	120	64 (fiber)/32 (coax)
Maximum Distance (m)	66,000	12,000	30,000 (fiber)/500 (coax)
Remote I/O	No	Yes	Yes

Note: MELSECNET/H is backwards compatible with MELSECNET/10. CC-Link IE was formerly known as MELSECNET/G.

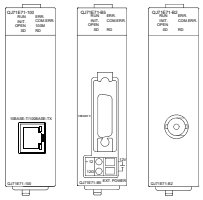
Device Level

Specifications	CC-Link	DeviceNet	PROFIBUS-DP	MODBUS/TCP	MODBUS/RTU
Network Level	Device	Device	Device	Device	Device
Architecture	Bus	Bus	Bus	Star (via hub)	Bus
Communications Media	STP	Thick/thin trunkline	STP	Cat. 5 (UTP/STP)	STP
Transmission Speed	10Mbit/s (all devices)	0.5Mbit/s	12Mbit/s (depends on devices used)	100Mbit/s	115kbps
Number of Stations	64	64	60	64	64
Maximum Distance (m)	1200/segment (extend up to 13.2km with repeaters)	500	1200	100	1200
Remote I/O	Yes	Yes	Yes	Yes	Yes

Sensor Level

Specifications	CC-Link/LT	AS-i
Network Level	Sensor	Sensor
Architecture	Bus	Star, bus or tree
Communications Media	Dedicated mechanically keyed cable	
Transmission Speed	2.5Mbit/s	172kbit/s
Number of Stations	64	31
Maximum Distance (m)	700	100
Remote I/O	Yes	Yes

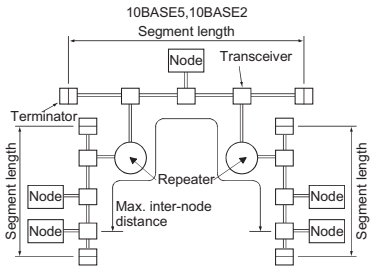
MELSEC Q Series / iQ Ethernet Enterprise Level Network Modules

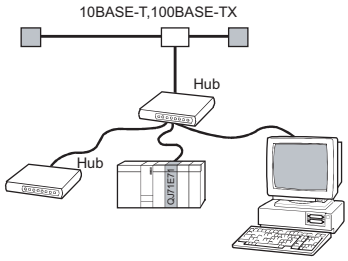


Typically Ethernet is used to link shop-floor systems to higher level IT systems for SCADA (Supervisory Control And Data Acquisition) monitoring, maintenance, and similar functions. The Q Series Ethernet modules provide a method of linking automation systems to existing standard LAN infrastructures throughout a plant.

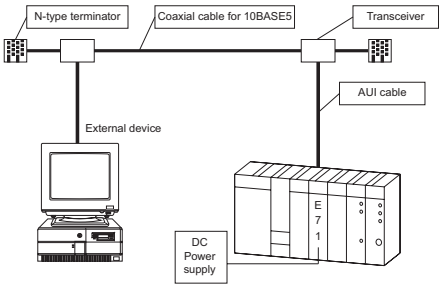
Key Features:

- GX Works2 provides complete support for configuration and maintenance of Ethernet connections including programming, monitoring, email & FTP capabilities for remote system monitoring & maintenance via Ethernet connection
- Compatible with existing LANs via range of physical connection formats (10base-T, 100base-TX, 10base-5, 10base-2)
- Peer-to-peer communication
- Multiple ports
- Acts as a gateway into lower level networks for access to individual stations on large networks
- "Keep Alive" function allows the status of external equipment to be monitored via TCP/IP

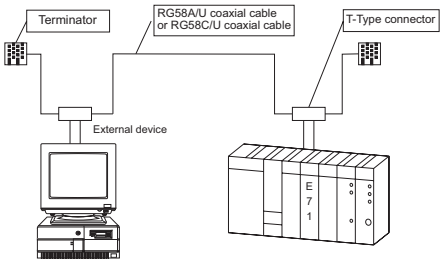




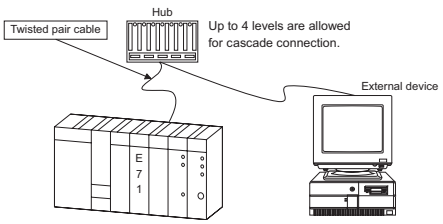
■ **10BASE5:QJ71E71-B5**



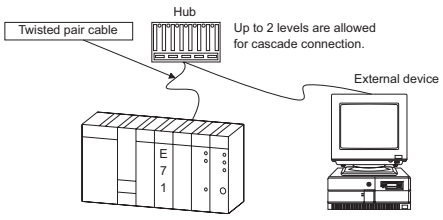
■ **10BASE2:QJ71E71-B2**



■ **10BASE-T:QJ71E71-100**



■ **100BASE-TX:QJ71E71-100**



Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800009	Ethernet Interface Module User's Manual (Hardware) QJ71E71-100, QJ71E71, QJ71E71-B2	Basic information on QJ71E71-100, QJ71E71 & QJ71E71-B2	Yes	-
SH(NA)080009	Q Corresponding Ethernet Interface Module User's Manual (Basic)	Covers programming and using the Ethernet modules	No (purchase separately)	-
SH(NA)080010	Q Corresponding Ethernet Interface Module User's Manual (Application)	Covers higher level functions, such as email, FTP, and integration with other networks	No (purchase separately)	-
SH(NA)080008	Q Corresponding MELSEC Communication Protocol Reference Manual	Reference guide to the MC Protocol used by the Q Series Ethernet modules (Also used by the QJ71C24 & QJ71C24-R2)	No (purchase separately)	-
SH(NA)080180	Manual (Web Function) Q Corresponding Ethernet Interface Module User's	Guide to using the Ethernet modules with an Internet connection	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Ethernet Enterprise Level Network Modules

Model Number			QJ71E71-100		QJ71E71-B5	QJ71E71-B2
Stocked Item			S		-	-
Certification			UL • cUL • CE			
Ethernet Transition Speed			100BASE-TX	10BASE-T	10BASE5	10BASE2
Transmission Specifications	Data Transmission Speed		100Mbps	10Mbps		
	Communication Mode		Full-duplex/Half-duplex	Half-duplex		
	Maximum Node-to-Node Distance		-		2500 m (8202.10 ft.)	925 m (3034.77 ft.)
	Maximum Segment Length		100 m (328.08 ft.) (*1)		500 m (1640.42 ft.)	185 m (606.96 ft.)
	Maximum Number of Modes/Connection		Cascade connection Maximum 2 stages	Cascade connection Maximum 4 stages	100 units/ segment	30 units/ segment
	Interval Between the Minimum Nodes		-		2.5 m (8.20 ft.)	0.5 m (1.64 ft.)
Transmission Data Storage Memory	No. of Simultaneously Open Connections Allowed		16 connections (Connections usable by the sequence program)			
	Fixed Buffer		1 k words x 16			
	Random Access Buffer		6 k words x 1			
	E-mail	Attached File	6 k words x 1			
		Attached File Format	Binary, ASCII or CSV can be selected. File name: XXXX.bin (binary), XXXX.asc (ASCII), XXXX.csv (CSV) (CSV: Comma Separated Value)			
		Main Text	960 words x 1			
I/O Device Points Occupied			32 points			
5VDC Internal Current Consumption			0.50A		0.50A	0.60A (*3)
12VDC External Power Supply Capacity (Transceiver)			-		(*2)	-
Weight kg (lb)			0.11 (0.24)		0.12 (0.26)	0.13 (0.29) (*3)
Base Unit Slots Occupied			1			

Notes:

1. Length between the Hub and node.
2. It is necessary to apply a transceiver, or a device that meets AUI cable specifications.
3. The product with first 5 digits of serial number "05049" or earlier is different as follows:
   - 5VDC internal current consumption: 0.70A
   - Weight: 0.14kg (0.31lb.)

MELSEC Q Series / iQ CC-Link IE Control Level Master/Local Network Modules

CC-Link IE is an industry leading alternative for open control level networking. Originally introduced as MELSECNET/G, it introduces an unprecedented 1Gbit/s Ethernet physical layer fiber topology for system performance surpassing any other network technology. MELSECNET/G has been turned over to the open administration of the CC-Link Partner Association (CLPA), and is now known as CC-Link IE. Mitsubishi offers full support for CC-Link IE via the Q Series Automation Platform and the iQ Platform system.

Key features:

- Practically unlimited bandwidth (1Gbit/s)
- Noise immune, fault tolerant dual loop optical fiber media
- Uses industry standard 1000base-SX optical fiber and LC type connectors
- Variety of Reliability, Availability & Serviceability (RAS) functions to allow network operation to continue despite broken media, power failures, etc
- Extensive diagnostic functions and tools to monitor network operation and quickly troubleshoot faults
- Up to 120 stations per network
- Up 550 meters between stations
- Connect up to 239 networks
- Program free parameter based configuration for cyclic communications

CC-Link IE

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800364E	CC-Link IE Network Module User's Manual (Hardware)	Basic information on QJ71GP21-SX & QJ71GP21S-SX	Yes	-
SH(NA)080668	CC-Link IE Network System Reference Manual (Controller Network)	Reference guide to the CC-Link IE network technology	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com.

CC-Link IE Optical Fiber Cordsets

Model Number	Description	Stocked Item
QG-_M-B-LL	CC-Link IE cordset, where _ represents length 1, 2, 3, 5, 10, 15, 20, 25, 30, 35, 40 or 50 meters	S
Belden	Belden part numbers. Ordered directly through Belden.	-

Model Number		QJ71GP21-SX	QJ71GP21S-SX
Stocked Item		S	-
Certification		UL • cUL • CE	
Network Common Memory		256 kbytes	
Transient Transmission Capacity		960 bytes	
Communication Speed		1 Gbps	
Number of Stations Per Network		When Universal model QCPU is used for control station: 120; (Control station: 1, Normal station: 119); When High Performance model QCPU is used for control station: 64 (Control station: 1, Normal station: 63)	
Connection Cable		Optical fiber cable (Multi-mode fiber)	
Overall Cable Distance		66000m (When 120 stations are connected)	
Max. Station-To-Station Distance		550m	
Max. Number of Networks		239	
Max. Number of Groups		32	
I/O Device Points Occupied		32	48 (I/O assignment: Empty first half: 16 points, Latter half: 32 points for intelli.)
External Power Supply	Voltage	No external power supply function	20.4V to 31.2VDC
	Current		0.28A
	Terminal Screw Size		M3
	Applicable Solderless Terminal		R1.25-3
	Allowable Momentary Power Failure Time		1ms (Level PS1)
Internal Current Consumption (5VDC)		0.85A	0.90A
Weight (kg)		0.18	0.28
Base Unit Slots Occupied		1	2

iQ Platform CC-Link IE Field Control and Remote I/O Network Module

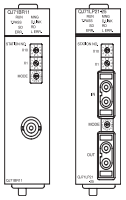
CC-Link IE Field brings 1 Gigabit speed for cyclic, acyclic and transient data transmission to RJ45 and Cat 5e cabling infrastructure. Create mixtures of line and star topology, and maintain control over up to 120 controller or remote I/O stations simultaneously on the same network.

Model Number		QJ71GF11-T2 (*1)
Stocked Item		S
Certification		UL • cUL • CE
Network Common Memory		32k bytes
Transient Transmission Capacity		2048 bytes
Ethernet	Communication Speed	1Gbps
	Connection Cable	An Ethernet cable that meets the 1000BASE-T standard (Category 5e or higher, shielded RJ45)
	Maximum Station-to-Station Distance	100m max. (Compliant with ANSI/TIA/EIA-568-B (Category 5e))
	Total Distance	Line topology: 12000m (when connected to 1 master station and 120 slave stations) Star topology: Depends on the system configuration
	Number of Cascade Connections	Up to 20
	Transmission Path	Line topology, star topology, ring topology and mix of both line topology and star topology is possible
Number of Connected Stations in One Network	Master Station	1 station
	Local Station	120 stations (Local station or Remote I/O) (*2)
Maximum Number of Networks		239
Communication Method		Token passing method
Number of Occupied I/O Points		32 points (I/O assignment: Intelligent 32 points)
Internal Current Consumption (5VDC)		0.85A
Weight (kg)		0.18
Base Unit Slots Occupied		1

Notes:

1. Must be used with QnU Universal CPUs with Serial Numbers starting with '12012' or higher.
2. For CC-Link IE Field Remote I/O stations, refer to the LJ72GF15-T2 CC-Link IE Field Slave Head station.

MELSEC Q Series / iQ MELSECNET/H Control Level Master/Local Network Modules



Use MELSECNET/H to link Q Series systems together on a control level network for the coordinated operation of multiple controllers on a production line or large machine. MELSECNET/H also supports the direct connection of PCs onto the network for SCADA or maintenance applications. MELSECNET/H was designed to offer similar performance benefits to most industrial Ethernet systems, while offering the high degree of performance required in an automation environment.

Key Features:

- MELSECNET/H configuration and maintenance is supported by GX Works2 with no need for accessory plug-ins
- High-speed communications at up to 25Mbit/s (depending on modules used)
- Backwards compatible with existing MELSECNET/10 installations
- Guaranteed determinism via token passing scheme
- Scalable to exceed the needs of the largest installations (over 15,000 stations in one system)
- Up to 30km loop circumference via fiber connections
- Loop topology optical fiber media offers maximum speed and dual redundancy
- Single bus coax offers many performance benefits with economical media
- No programming required to establish cyclic network communications; just set parameters in GX Works2
- Transient communications permit asynchronous peer to peer messaging
- Loop topology offers recovery from media breaks via automatic loop back
- Floating master maintains network operation by allowing any station to take over after the original master goes offline
- Offline stations return to the network automatically when able
- Extensive diagnostic functions to monitor network operation and status
- Program & monitor across the network
- Transmit up to 35 kbytes of uninterrupted data for increased performance and simpler programming (S/N 06092x, Version D units or later)

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800144	MELSECNET/H Network Module User's Manual (Hardware) QJ71LP21-25, QJ71LP21G, QJ71BR11	Basic information on QJ71LP21-25, QJ71LP21G & QJ71BR11 (MELSECNET/H master modules)	Yes	-
SH(NA)080049	MELSECNET/10H for Q Network System Reference Manual (PLC to PLC network)	General reference to MELSECNET/H (MELSECNET/H & MELSECNET/10H are equivalent terms)	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

MELSECNET/H Optical Fiber

Optical fiber media cable is available for connecting MELSECNET/H networks.

Model Number	Description	Stocked Item
AS-1000M-B	Optical fiber cable, sold by the meter	S
DL-72ME	AS-1000M-B connector, MEAU offers the service to provide pre-terminated cables as required	S
PA7003	Splice connector for joining pre-terminated AS-1000M-B cable	-
CAK-0068ME	Optional termination tool kit for AS-1000M-B and DL-72ME for on-site termination work	-

MELSECNET/H Control Level Master/Local Network Modules

Model Number		QJ71LP21-25	QJ71LP21S-25	QJ71LP21G	QJ71LP21GE
Stocked Item		S	-	-	-
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Connection Form		Duplex loop type			
Max. Number of Link Points Per Network		MELSECNET/H Mode / MELSECNET/10 Mode: LX/LY 8192 points (8k bits) / 8192 points (8k bits); LB 16384 points (16k bits) / 8192 points (8k bits); W 16384 points (16k words) / 8192 points (8k words)			
Max. Number of Link Points Per Station		[LW+LB+LY<=2000 bytes (cyclic communication)]+[LW+LB+LY<=2000 bytes (low-speed cyclic communication)]			
Transient Transmission Capacity		Max. 1920 bytes/frame			
Transmission Speed		10Mbps/25Mbps (depending on switch setting) (*1)		10Mbps	10Mbps
Cable Type		Optical (AS-1000M-B (SI, 200/250)) (*2)	Optical (AS-1000M-B (SI, 200/250)) (*2)	Optical (GI-50/125)	Optical (GI-62.5/125)
Max. Number of Networks		239			
Max. Number of Groups		32			
Number of Stations Connected		64 stations (1: control station, 63: normal station)			
Overall Distance		30km (98360.67 ft.)			
Station to Station Distance		Cable Type / Transmission Speed (10Mbps / 25Mbps): SI 500m (3278.69 ft.) / 200m (1312.33 ft.); H-PCF 1km (3278.69 ft.) / 400m (1312.33 ft.); Broadband H-PCF 1km (3278.69 ft.) / 1km (3278.69 ft.); QSI 1km (3278.69 ft.) / 1km (3278.69 ft.)		2km (6557.38 ft.)	
Distance Extension Repeater		-			
I/O Device Points Occupied		32 points	48 points (I/O assignment: first 16 points as empty, 1st 32 points as intelligent)	32 points	
External Power Supply	Voltage	-	20.4 to 31.2VDC	-	-
	Current	-	0.20 A	-	-
	Terminal Screw Size	-	M3 Screw	-	-
	Applicable Solderless Terminal	-	R1.25-3	-	-
	Applicable Wire Size	-	0.3 to 1.25 mm^2	-	-
	Tightening Torque	-	42 to 58N • cm	-	-
Internal Current Consumption (5VDC) (A)		0.55	0.55	0.55	0.55
Weight (kg)		0.11	0.20	0.11	0.11
Base Unit Slots Occupied		1	2	1	

Notes:

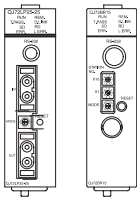
1. 25 Mbps is available for the MELSECNET/H mode only.
2. Other types of fiber cables can be used, see "Station-to-station distance". To order pre-assembled AS-1000M-B cables, specify cable length, two DL-72ME connectors, and labor-TSS surcharge.

MELSECNET/H Control Level Master/Local Network Modules

<table>
<tr><th>Model Number</th><th>QJ71BR11</th><th>QJ71NT11B</th></tr>
<tr><td>Stocked Item</td><td>S</td><td>S</td></tr>
<tr><td>Certification</td><td colspan="2">UL • cUL • CE</td></tr>
<tr><td>Connection Form</td><td>Simplex bus type</td><td>Token bus</td></tr>
<tr><td>Max. Number of Link Points Per Network</td><td>
<table>
<tr><th></th><th>MELSECNET/H Mode</th><th>MELSECNET/10 Mode</th></tr>
<tr><td>LX/LY</td><td>8192 points (8k bits)</td><td>8192 points (8k bits)</td></tr>
<tr><td>LB</td><td>16384 points (16k bits)</td><td>8192 points (8k bits)</td></tr>
<tr><td>W</td><td>16384 points (16k words)</td><td>8192 points (8k words)</td></tr>
</table>
</td><td>
<table>
<tr><th></th><th>MELSECNET/H Mode,
MELSECNET/H Extended Mode (*1)</th></tr>
<tr><td>LX/LY</td><td>8192 points</td></tr>
<tr><td>LB</td><td>16384 points</td></tr>
<tr><td>W</td><td>16384 points</td></tr>
</table>
</td></tr>
<tr><td>Max. Number of Link Points Per Station</td><td>[LW+LB+LY<=2000 bytes (cyclic communication)]+[LW+LB+LY<=2000 bytes (low-speed cyclic communication)]</td><td>MELSECNET/H mode: {(LY+ LB) /8 + (2 × LW)} ≤ 2000 bytes (*2)
MELSECNET/H Extended mode: {(LY+ LB) /8 + (2 × LW)} ≤ 35840 bytes (*2)</td></tr>
<tr><td>Transient Transmission Capacity</td><td colspan="2">Max. 1920 bytes/frame</td></tr>
<tr><td>Transmission Speed</td><td>10Mbps</td><td>156kbps/312kbps/625kbps/1.25Mbps/2.5Mbps/5Mbps/10Mbps
(Switched by network parameters)</td></tr>
<tr><td>Cable Type</td><td>Coaxial 75Ω; RG-59B/U RG-11A/U</td><td>Twisted pair cable or CC-Link Ver.1.10-compatible cable(*4)</td></tr>
<tr><td>Max. Number of Networks</td><td colspan="2">239</td></tr>
<tr><td>Max. Number of Groups</td><td colspan="2">32</td></tr>
<tr><td>Number of Stations Connected</td><td colspan="2">32 stations (1: control station, 31: normal station)</td></tr>
<tr><td>Overall Distance</td><td colspan="2">500m (1639.34 ft.)
RG-11A/U) / 300m
(983.61 ft.) (RG-59B/U)</td></tr>
<tr><td>Station to Station Distance</td><td colspan="2">
<table>
<tr><th>Communication Speed</th><th>Twisted Pair Cable</th><th>CC-Link Ver. 1.10-Compatible Cable</th></tr>
<tr><td>156kbps (*3)</td><td>1200m</td><td>1200m</td></tr>
<tr><td>312kbps</td><td>600m</td><td>900m</td></tr>
<tr><td>625kbps</td><td>400m</td><td>600m</td></tr>
<tr><td>1.25Mbps</td><td>200m</td><td>400m</td></tr>
<tr><td>2.5Mbps</td><td rowspan="3">(Not applicable)</td><td>200m</td></tr>
<tr><td>5Mbps</td><td>150m</td></tr>
<tr><td>10Mbps</td><td>100m</td></tr>
</table>
</td></tr>
<tr><td>Distance Extension Repeater</td><td>Up to 2.5km (8196.72 ft.) by connection of max. four repeaters.
Use A6BR10/ A6BR10-DC repeaters.</td><td>-</td></tr>
<tr><td>I/O Device Points Occupied</td><td>32 points</td><td>32 points</td></tr>
<tr><td>Internal Current Consumption (5VDC) (A)</td><td>0.75</td><td>0.6</td></tr>
<tr><td>Weight (kg)</td><td>0.11</td><td>0.13</td></tr>
<tr><td>Base Unit Slots Occupied</td><td colspan="2">1</td></tr>
</table>

Notes:
1. Mode selection is performed using network parameters.
2. The number of LY points of the stations set in the I/O master station is the sum total of the LY points for output to all stations within the block.
3. This value is set as default of the communication speed.
4. For details of cable specifications, refer to the user manual.

MELSEC Q Series / iQ MELSECNET/H Remote I/O Network Modules



These modules form a complimentary solution to the master/local modules. The master/local modules allow CPUs to be linked for information exchange. The remote I/O modules fit on a base rack in place of the CPU, and allow this rack of I/O to be operated under the control of a remote Q Series CPU over a MELSECNET/H link.

Key Features:

- Fiber loop & coax bus versions available
- Place complex I/O combinations on a remote network link
- Most I/O & special function modules (analog, motion, communications, etc) can be installed on a remote I/O rack
- Remote I/O modules offer a communication port on the I/O rack when local access is required

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800145	MELSECNET/H Network Module User's Manual (Hardware) QJ72LP25-25, QJ72LP25G	Basic information on QJ72LP25-25, QJ72LP25G, QJ72BR15, QJ72BR15 (MELSECNET/H remote I/O station modules)	Yes	-
SH(NA)080124	Q Corresponding MELSECNET/H Network System Reference Manual (Remote I/O network)	General reference to MELSECNET/H remote I/O network	No (purchase separately)	-

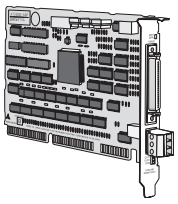
Note: Many of these manuals are available by free download from our website, www.meau.com

Model Number		QJ72LP25-25	QJ72LP25G	QJ72LP25GE	QJ72BR15
Stocked Item		S	-	-	S
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Connection Form		Duplex loop type			Simplex bus type
Max. Number of Link Points Per Station		Remote I/O station to remote master station ((LY+LB)/8 + (2 LW)) </- 1600 bytes			
Transient Transmission Capacity		Max. 1920 bytes/frame			
Transmission Speed		10Mbps/25Mbps (depending on switch setting)	10Mbps		
Cable Type		Optical (AS-1000M-B (SI, 200//250)) (*1)	Optical (GI-50/125)	Optical (GI-62.5/125)	Coaxial 75Ω (RG-59B/U, RG-11A/U)
Max. Number of Networks		239			
Number of Stations		65 stations (1:remote master station, 1:remote I/O station)			33 stations (1:remote master station, 32:remote I/O station)
Overall Distance		30km (98360.66 ft.)			500m (1639.34 ft.) (RG-11A/U); 300m (983.61 ft.) (RG-59B/U)
Distance Extension Repeater		-	-	-	Up to 2.5km (8196.72 ft.) 4 repeaters max. Use A6BR10/ A6BR10-DC
Max. Distance Between Stations	Communication Speed: 10Mbps	SI type optical cable: 500m (3278.69 ft.); H-PCF type optical cable: 1km (3278.69 ft.); Broadband H-PCF cable: 1km (3278.69 ft.); QSI type optical cable: 1km (3278.69 ft.)	2km (6557.38 ft.)	2km (6557.38 ft.)	-
	Communication Speed: 25Mbps	SI type optical cable: 200m (1312.33 ft.); H-PCF type optical cable: 400m (1311.48 ft.); Broadband H-PCF cable: 1km (3278.69 ft.); QSI type optical cable: 1km (3278.69 ft.)	-	-	-
5VDC Internal Current Consumption (A)		0.89	0.89	0.89	1.1
Weight (kg)		0.15	0.15	0.15	0.16
Base Unit Slots Occupied		1			

Note: 1. Other types of fiber can be used. See "Interstation distance". AS-1000M-B is purchased by the meter and can be ordered pre-assembled with DL-72ME connectors and LaborTSS surcharge.

PC Network Cards

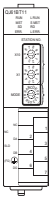
Many of our larger scale controller systems are typically integrated into large-scale plant wide networks that require integration with PC based systems. Mitsubishi Electric addresses this requirement with a range of PC compatible network cards that allow a PC to be directly connected to a number of our networks. These boards are typically used as the physical network interface for a PC system written in third party applications such as Microsoft® Visual Basic ™, Visual C++™, etc.



Model Number	Q80BD-J71GP21-SX	Q80BD-J71GP21S-SX	Q80BD-J71LP21-25	Q81BD-J71LP21-25	Q80BD-J71LP21G	Q80BD-J71LP21GE	Q80BD-J71BR11	Q80BD-J61BT11N	Q81BD-J61BT11 (*1)
Stocked Item	-	-	S	-	-	-	S	S	-
Certification	UL • cUL • CE				CE		UL • cUL • CE		
Network Type	CC-Link IE Control		MELSECNET/H					CC-Link	
Media Type	Optical Fiber (62.5 micron)		Optical Fiber (200 micron)	Multi-mode Optical Fiber	Optical Fiber (50 micron)	Optical Fiber (62.5 micron)	Coax	Twisted Pair	
Configuration Type	Dual loop						Bus		
Station Type	Master/local								
External Power Supply	No	Yes	No						

Note:
1. Supports PCI Express bus.

CC-Link Device Level Master/Local Network Module



Device level networks typically link a controller to the physical components of a system that it controls. CC-Link represents the next level down from MELSECNET/H in the networking hierarchy and allows devices such as I/O modules, VFDs, HMIs and servos to be connected to the controller in a very cost effective, high performance way via a single network cable.

Key Features:

- QJ61BT11N module supports CC-Link V2.0
- V2.0 increases I/O capacity to 8192 points and data capacity to 4096 words (up from 2048 and 512 respectively)
- V2.0 permits more efficient use of network station address space
- CC-Link configuration and maintenance is supported by GX Works2 with no need for accessory plug-ins
- Control up to 64 CC-Link networks from a single Q Series system
- Open device network with over 200 vendors
- Eliminates costly wiring harnesses with a single economical cable
- Adds device diagnostic capabilities
- All devices on the network support high performance 10Mbit/s communications speed
- Up to 13.2km bus length with repeaters
- Redundant master station capability
- Fully supported by all Mitsubishi automation products
- Very wide array of products available

Please see the CC-Link part of the Distributed I/O section for a full listing of the CC-Link I/O products available.

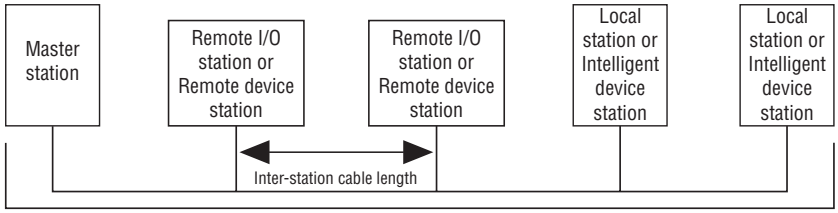
Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800250	CC-Link System Master/Local Module User's Manual (Hardware) QJ61BT11N	Covers basic information on QJ61BT11N	Yes	-
SH(NA)080394	CC-Link System Master/Local Module User's Manual QJ61BT11N	Covers programming a CC-Link system	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Model Number	QJ61BT11N
Stocked Item	S
Certification	UL • cUL • CE
Transmission Rate	Selectable 156 kbps/ 625 kbps/ 2.5 Mbps/ 5 Mbps/ 10 Mbps
Maximum Overall Cable Distance (Maximum Transmission Distance)	Varies according to the transmission rate (156 kbps: 1200m; 10Mbps: 100m)
Maximum Number of Connected Stations (Master Station)	64
Number of Occupied Stations (Local Station)	1 to 4 stations; The number of stations can be switched using the GX Works2 parameter setting.
Maximum Number of Link Points Per System	Remote I/O (RX, RY): 8192 points; Remote write register (RWw): 2048 words. Remote read register (RWr): 2048 words
Remote Station/Local Station/Intelligent Device Station/Standby Master Station Maximum Number of Link Points Per Station	Remote I/O (RX, RY): 128 points; Remote write register (RWw): 32 words (master station - remote device station/local station/ intelligent device station/standby master station); Remote register (RWr): 32 words (remote device station/local station/intelligent device station/standby master station - master station)
RAS Function	Automatic return function; Slave station cut-off function; Error detection by the link special relay/register
I/O Device Points Occupied	32 points
5VDC Internal Current Consumption	0.46 A
Base Unit Slots Occupied	1

CC-Link Device Level Master/Local Network Module (continued)

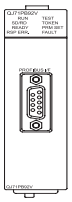
Model Number		QJ61BT11N
Max. Overall Cable Length and Interstation Cable Length (Ver. 1.10 or later)	Same Specifications Regardless of System Configuration	

Ver. 1.10-Compatible CC-Link Dedicated Cable (Terminating Resistor 110Ω Used)

Transmission Speed	Interstation Cable Length	Max. Overall Cable Length
156kbps	20 cm (7.88 inch) or more	1200m (3934.43 ft.)
625kbps		900m (2950.82 ft.)
2.5Mbps		400m (1311.48 ft.)
5Mbps		160m (524.59 ft.)
10Mbps		100m (327.87 ft.)

Connection Cable	BA1SJ61-S (signal only) / BA1SJ61-P (signal and power)
Internal Current Consumption (5VDC) (A)	0.46
Weight (kg)	0.12
Base Unit Slots Occupied	1

Q Series / iQ PROFIBUS-DP V1 & V2 Device Level Network Master Module



The QJ71PB92V supports the more recent PROFIBUS-DPV1 and V2 advanced function set.

Key Features:

- PROFIBUS-DPV1 functions:
  - Acyclic slave communications
  - Slave alarm acquisition
- PROFIBUS-DPV2 functions:
  - Slave station clock control
- General functions:
  - Up to 125 slave stations
  - Support for slave configuration with CommDTM/FDT
  - Program using GX Configurator DP V7.0

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800324	Profibus-DP Master Module User's Manual (Hardware)	Covers basic information on QJ71PB92V	Yes	-
SH(NA)080572	Profibus-DP Master Module User's Manual	Covers using the QJ71PB92V	No	-

Note: Many of these manuals are available by free download from our website, www.meau.com

PROFIBUS-DP Master Module Performance Specifications

Model Number		QJ71PB92V		
Stocked Item		S		
Certification		UL • cUL • CE		
PROFIBUS-DP Station Type		Class 1 master station		
Transmissions Specifications	External Standard & Characteristics	EIA-RS485 compatible		
	Communication Cable	Shielded twisted pair cable		
	Network Configuration	Bus type (tree type if repeater is used)		
	Transmission Rate (*1) Maximum Transmission Distance (*2)	Transmission Rate	Transmission Distance	Max. Transmission Distance when Using Repeater (*2)
		9.6kbps	1200m/segment	4800m/network
		19.2kbps		
		93.75kbps		
		187.5kbps	1000m/segment	4000m/network
		500kbps	400m/segment	1600m/network
		1.5Mbps	200m/segment	800m/network
		3Mbps	100m/segment	400m/network
		6Mbps		
		12Mbps		
	Max. No. of Repeaters In a Path	3 repeaters		
	Max. No. of Stations	32 stations per segment (including repeaters)		
	Max. No. Slave Stations	125 slaves per single QJ71PB92V master		
	I/O Data Size	Max. 8192 words (4096 input words, 4096 output words)		
I/O Device Points Occupied		32 points		
5VDC Internal Current Consumption		0.57A		
Weight (kg)		0.13		
Base Unit Slots Occupied		1		

Notes:

1. Transmission rate control is within ±0.2% (compatible with IEC 61158-2).
2. The "maximum transmission distance" in the above table is an example which assumes that 3 repeaters are being used. If more repeaters are used to extend the distance, the maximum transmission distance would be calculated as follows: [Maximum transmission distance (m/network)] = [Number of repeaters +1] x [transmission distance (m/segment)]

MELSEC Q Series / iQ PROFIBUS-DP Device Level Network Slave Module

The QJ71PB93D allows a Q Series system to be connected to a third party PROFIBUS-DP network as a slave controller. This allows distributed processing systems to be built where local control of the application can be given to the Q Series, which then supplies information back to a supervisory controller. This could be another Q Series system, fitted with the QJ71PB92D. Configure the QJ71PB93D using the GX Configurator-DP plug in for GX Developer.

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080318	Profibus-DP Slave Module type QJ71PB93D User's Manual	Covers QJ71PB93D and GX Configurator-DP	No	-
IB(NA)0800230	Profibus-DP Slave Module User's Manual (Hardware) QJ71PB93D	Basic information on QJ71PB93D	Yes	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Model Number		**QJ71PB93D**		
Stocked Item		-		
Certification		UL • cUL • CE		
PROFIBUS-DP Station Type		Slave station (EN50170 Volume 2 (Parts 1-4, 8) compliant)		
Station Number Setting Range		0 to 125 (*3)		
Max. Communication Data Size		Number of I/O data is 192 words in total (Number of input or output data is up to 122 words)		
Transmission Specifications	**Electrical Standards**	Complies with EIA-RS485		
	Network Cable	Dedicated PROFIBUS DP cable		
	Network Configuration	Bus (tree type when a repeater is used)		
	Transmission Speed / Maximum Transmission Distance (*1, *2)	Transmission Speed	Transmission Distance [m/segment]	Max. Transmission Distance with 3 repeaters [m]
		9.6 [kbps]	1200	4800
		19.2 [kbps]		
		45.45 [kbps]		
		93.75 [kbps]		
		187.5 [kbps]	1000	4000
		500 [kbps]	400	1600
		1500 [kbps]	200	800
		3 [Mbps]	100	400
		6 [Mbps]		
		12 [Mbps]		
	Max. Number of Repeaters / Network	3 units (*2)		
	Max. Number of Stations / Segment	32 stations (including repeaters)		
	Number of Connection Nodes / Segments	32		
I/O Device Points Occupied		32 points		
5VDC Internal Power Consumption		0.44		
Weight (kg)		0.11		
Base Unit Slots Occupied		1		

Notes:

1. Transmission speed control within ±3% (Compliant with EN50170 Volume 2)
2. Distance that the transmission distance can be expanded by (m/network) using repeaters.
   Maximum transmission distance (m/network) = (number of repeaters + 1) x transmission distance (m/segment)
3. Factory set to "126" (EN50170 Volume 2 compliant)
   Set the station number by using sequence program or GX Configurator-DP 4.03D or later.
   Set communication parameters on the master station side.
   GSD (DDB) file may be required without GX Configurator-DP Version 4.03D or later. Please contact your local Mitsubishi representative for the GSD (DDB file).

MELSEC Q Series / iQ MODBUS/TCP Network Module

The QJ71MT91 module offers a full MODBUS/TCP network communications facility to any Q Series system. Use this module to establish control of a MODBUS/TCP network of devices from a Q Series based system.

Key Features:

- Easily configured with Intelligent Function Module utilities in GX Developer or GX Works2 (requires plug-in)
- GX Configurator-MB or GX Configurator2-MB reduce setup and maintenance time
- Master communication function supports both automatic communications or communication under program control if required
- Also supports slave communication functions including automatic response and MODBUS device assignment
- Both slave and master functions can operate concurrently
- 100Mbit Ethernet capability with KeepAlive and router relay functions

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800280	MODBUS/TCP Interface Module User's Manual (Hardware) QJ71MT91	Basic information on QJ71MT91	Yes	-
SH(NA)080446	MODBUS/TCP Interface Module User's Manual	Covers QJ71MT91 & GX Configurator MB	Included with GX Configurator MB as PDF	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Model Number			QJ71MT91	
			10BASE-T	100BASE-TX
Stocked Item			S	
Certification			UL • cUL • CE	
Transmission Specifications	Data Transmission Rate		10Mbps	100Mbps
	Maximum Node-To-Node Distance		200m	
	Maximum Segment Length (*1)		100m	
	Number of Cascade Connection Stages		Max. 4 stages	Max. 2 stages
	Maximum Number of Connections (*2)		64 connections	
	Number of Routers That Can Be Set		1 default router + any 8 routers	
	Cable		Cable compliant with the IEEE802.3 10BASE-T Standard (unshielded twisted pair cable (UTP cable), Category 3, 4, 5)	Cable compliant with the IEEE802.3 100BASE-TX Standard (shielded twisted pair cable (STP cable), Category 5)
	Connector Applicable For External Wiring		RJ45	
Master Function	Automatic Communication Function	Number of Slaves (*3)	64 slaves	
		Input Area Size	4k words	
		Output Area Size	4k words	
	Dedicated Instruction	Number of Instructions That Can Be Executed Concurrently (*4)	Up to 8 instructions	
		Input Area Size	Max. 253 bytes per instruction	
		Output Area Size	Max. 253 bytes per instruction	
Slave Function	MODBUS Device Size	Coil	64k points	
		Input	64k points	
		Input Register	64k points	
		Holding Register	64k points	
		Extended File Register	Max. 4086k points	
	No. of Simultaneously Acceptable Request Messages		64	
Number of Simultaneously Connectable MELSOFT PCs			Max. 8	
I/O Device Points Occupied			32 points	
5VDC Internal Current Consumption			0.52A	
Weight (kg)			0.11	
Base Unit Slots Occupied			1	

Notes:
1. Length between a hub and a node.
2. Indicates the number of TCP connections that can be established simultaneously.
3. Indicates the maximum number of slaves that can be communication targets.
4. Indicates the maximum number of dedicated instructions that can be started simultaneously from a sequence program.

MELSEC Q Series / iQ MODBUS® RTU Master Module

The QJ71MB91 module adds Modbus RTU capability to a Q Series system. Use this module to communicate with and control any of a wide variety of third party Modbus compatible products.

Key Features:

- Easily configured with Intelligent Function Module utilities in GX Developer or GX Works2 (requires plug-in)
- GX Configurator-MB or GX Configurator2-MB reduce setup and maintenance time
- Supports master communication with automatic communication
- Dedicated instructions are available for communications
- Supports slave communications with automatic response and device assignment function
- Link operation function; allows a third party Modbus device to communicate with Modbus slaves connected to the Q Series controller via the QJ71MB91 module
- 115.2kbps communication speed

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800329	Modbus Interface Module User's Manual (Hardware)	Basic information on the QJ71MB91	Yes	-
SH(NA)080578	Modbus Interface Module User's Manual	Covers QJ71MB91 and GX Configurator MB	No	-

Note: Many of these manuals are available by free download from our website, www.meau.com. Modbus is a registered trademark of Schneider Electric.

Model Number			QJ71MB91
Stocked Item			S
Certification			UL • cUL • CE
Transmission Specifications	Number of Interfaces		RS-232 1 channel; RS-422/485 1 channel
	Transmission Speed (bps)		Total transmission speed of two interfaces must be 115200 bps or less. 300 / 600 / 1200 / 2400 4800 / 9600 / 14400 / 19200 28800 / 38400 / 57600 / 115200
	Transmission Distance (Overall Distance)	RS-232	Max. 15m (49.2 ft.)
		RS-422/485	Max. 1200m (3936.9 ft.) (Overall distance)
Master Function	Automatic Communication Function	Number of Slaves (*1)	32 per channel
		Input Area Size	4k words
		Output Area Size	4k words
	Dedicated Instruction	Number of Instructions That Can Be Executed Concurrently (*2)	1 per channel
		Input Area Size	Max. 253 bytes per instruction
		Output Area Size	Max. 253 bytes per instruction
Slave Function	MODBUS® Device Size	Coil	64k points
		Input	64k points
		Input Register	64k points
		Holding Register	64k points
		Extended File Register	Max. 4086k points
	No. of Simultaneously Acceptable Request Messages		1 request per channel
	Station No.		1 to 247
I/O Device Points Occupied			32 points
5VDC Internal Current Consumption			0.31A
Weight (kg)			0.20
Base Unit Slots Occupied			1

Notes:

1. Indicates the maximum number of slaves that can be communication targets.
2. Indicates the maximum number of dedicated instructions that can be activated simultaneously from a sequence program.

MELSEC Q Series / iQ EtherNet/IPTM Scanner

The EIP4CCPU is an EtherNet/IPTM Scanner for the iQ Platform. It allows the iQ Platform to talk with other Ethernet/IP connected third party CPUs such as ControlLogix or CompactLogix to share data, and to directly control EtherNet/IPTM distributed devices such as I/O (Block or Point), drives, and other devices. The scanner is configured using the EIP4CCPU Scanner Configuration Utility (a free utility that can be downloaded on meau.com). The EIP4CCPU Scanner Configuration Utility discovers and configures the network settings of a scanner regardless of its network parameters, making it very easy to setup a new module or reconfigure an existing module.

Required Manual

Model Number	Description	Contents	Included?	Stocked Item
ICC-#10816	EIP4CCPU User's Manual	Covers EIP4CCPU	Yes	-

Model Number		EIP4CCPU
Stocked Item		-
Number of Client TCP Connections		32 (*1)
Number of Server TCP Connections		8
PLCs Supported on Backplane		1 to 3
Changing Configuration During Operation		Yes (*2)
Client Class 1 Implicit (I/O) Messaging	CIP Connections	60 (*3)
	Total Combined Input and Output Data Size	Up to 14KB (high speed shared memory limitation)
	Max Data Size	511 bytes
	Connection Type (Target to Originator)	Multicast (*4)
	Transport Trigger	Cyclic
	Data Type	SINT, USINT
	RPI	1 to 8388ms
	Minimum Timeout Time	128ms (timeout multiplier is adjusted according to the RPI)
Client Explicit Messaging	Class 3 CIP Connections (Connected)	16 (*3, *5)
	UCMM (Unconnected)	16 outstanding requests (*5)
	Max Data Size	120 words
	Connection Type (Target to Originator)	Point-to-Point
	Cache Type	Un-cached
	Transport Trigger	Application
	Data Type	INT, UINT
	RPI	7500ms
	Timeout Multiplier	4x
	Tag Access Methods	Data table read/write, Typed read/write, CIP generic
	PLC Implementation	Based on populating internal PLC registers with a predefined messaging structure
Server Class 3 Explicit Messaging	CIP Connections	16
	Max Data Size	250 words
	Connection Type (Target to Originator)	T->O Point-to-Point
	Transport Trigger	Application
	Data Type	INT, UINT
	RPI	1 to 8388ms
	Timeout Multiplier	4x to 512x
	Tag Access Methods	Data table read/write, Typed read/write, CIP generic
	PLC Implementation	Predefined device mappings

Notes:

1. The client TCP and CIP connections share a common resource pool. The number of TCP and CIP connections is dependent upon one another and must satisfy the following formulas:
   1. (Number of TCP connections * 4) + (Number of CIP connections) <= 160
   2. (Number of CIP connections) <= 60
2. If configuration is changed via EtherNet/IP by editing the Connection Configuration objects (RSNetWorx for EtherNet/IP method), the configuration will take effect immediately without rebooting the device. If the configuration is transferred as an XML file via FTP to the device (Windows® Configuration Utility method), a reboot is required for the configuration to take effect.
3. The number of simultaneous class 1 connections lists the total number of simultaneous I/O connections that can be made to remote devices, regardless of whether or not those devices are being served by a single adapter at one IP address (modular devices such as Flex I/O and Point I/O will consume one class 1 connection for each module attached to the chassis/adapter). Because the scanner supports up to 128 TCP connections (sockets), up to 128 simultaneous physical remote devices (adapters) can be attached to. At the same time, the scanner contains a pool of 256 class 1 CIP connections and 16 class 3 CIP connections. So, for example, if the scanner is configured to target one Flex I/O adapter with three modules on the chassis, then it will use the following internal resources: one TCP connection and three class 1 CIP connections. Additionally, if the user wants a connected explicit messaging request to target (for example) module #2 on the chassis, then this will consume one of the 16 class 3 CIP connections (so in total, one TCP connection, three class 1 CIP connections, and one class 3 CIP connection will be in use). During configuration, the user can keep adding connections until they run out of either TCP connections or 17 ICC class 1 connections. For example, if the network contains a large number of modular devices with multiple modules on each adapter, then it is likely that the pool of class 1 CIP connections will be exhausted first. On the other hand, if the network does not contain any modular devices, then only one class 1 CIP connection will be required for each TCP connection, and it is therefore likely that the number of TCP connections will be exhausted first.
4. Up to 20 unique multicast addresses are supported per TCP connection.
5. Both connected and unconnected explicit messaging requires the use of interrupts. Each interrupt can only service one outstanding explicit message at any given time. Since there are only 16 interrupts, the total number of outstanding connected and unconnected explicit messages cannot exceed 16.

MELSEC Q Series / iQ DeviceNet™ Device Level Network Master Module

The DeviceNet master module allows the Q Series to control systems that require integration of third party DeviceNet products. The QJ71DN91 module is configured by use of the GX Configurator-DN plug-in for GX Developer or GX Configurator2-DN in GX Works2. Note that this module is also capable of functioning as a DeviceNet slave if required.

Required Manuals for DeviceNet

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800149	QJ71DN91 User's Manual (Hardware)	Covers basic information on QJ71DN91	Yes	-
SH(NA)080143	DeviceNet Master-Slave Module User's Manual	Covers programming of the QJ71DN91 module and GX Configurator-DN	Included as PDF with GX Configurator-DP	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Model Number				QJ71DN91
Stocked Item				S
Certification				UL • cUL • CE
Node Type				DeviceNet master (Group 2 only client)
Node Number Which Can be Set				0 to 63
Functioning as Master	Number of Connections that can be Created	Message Connection		63
		I/O Connection		63 (polling, bit strobe, change of state, cyclic)
	Amount of Communication Data	I/O Communication	Send	Max. 4096 points (512 bytes), max. 256 bytes per 1 node
			Receive	Max. 4096 points (512 bytes), max. 256 bytes per 1 node
		Message Communication	Send	Max. 240 bytes
			Receive	Max. 240 bytes
Functioning as Slave	Node Type			DeviceNet slaves (Group 2 server)
	Setting Possible Node Number			0 to 63
	Number of Connections that can be Created	I/O Connection		1 (polling)
	Amount of Communication Data	I/O Communication	Send	Max. 1024 points (128 bytes)
			Receive	Max. 1024 points (128 bytes)
Transmission Speed				One speed can be selected from 125, 250 and 500kbit/s

Maximum Cable Length*

Communications Speed	Maximum Transmitting Distance of Trunk Line			Length of Drop Line	
	Thick Cables	Thin Cables	Thick and Thin Cables Coexist	Maximum	Total
125kbaud	500m (1640 ft.)	100m (328 ft.)	See table below	6m (20 ft.)	156m (511 ft.)
250kbaud	250m (820 ft.)				78m (256 ft.)
500kbaud	100m (328 ft.)				39m (128 ft.)

Current Consumption Required on the Network (A)	0.03
I/O Device Points Occupied	32 points
5VDC Internal Current Consumption (A)	0.17
Weight (kg)	0.11
Base Unit Slots Occupied	1

* The maximum cable length complies with that in the DeviceNet specification (release 2.0) volumes 1 & 2.

Combined Distance of Thick and Thin Cables

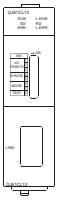
Transmission Speed	Max, Combined Distance of Thick and Thin Cables
125kbaud	Thick cable length + 5 x Thin cable length ≤ 500m (1640 ft.)
250kbaud	Thick cable length + 2.5 x Thin cable length ≤ 250m (820 ft.)
500kbaud	Thick cable length + Thin cable length ≤ 100m (328 ft.)

MELSEC Q Series CC-Link/LT Sensor Level Network Master Module

The QJ61CL12 allows the Q Series to control a CC-Link/LT network segment. Key features of CC-Link/LT are:

- Connect network devices with no cutting or stripping of cable
- I/O is addressed like it was on the rack; no special programming required
- Control up to 1024 I/O per master
- Compatible with CC-Link
- Fine granularity of I/O allows placement of small groups of I/O where required

CC-Link/LT



Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800232	QJ61CL12 CC-Link / LT Master Module User's Manual (Hardware)	Basic information on QJ61CL12	Yes	-
SH(NA)080351	CC-Link / LT Master Module User's Manual QJ61CL12	Covers QJ61CL12 and CC-Link/LT	No	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Model Number				QJ61CL12		
				4-Point Mode	8-Point Mode	16-Point Mode
Stocked Item				-		
Certification				UL • cUL • CE		
Control Specifications	Max. Number of Link Points [When The Same I/O Address Is Used]			256 points (512 points)	512 points (1024 points)	1024 points (2048 points)
	Number of Link Points Per Station [When The Same I/O Address Is Used]			4 points (8 points)	8 points (16 points)	16 points (32 points)
	Link Scan Time (ms)	When 32 Stations Are Connected	Number of Points	128 points	256 points	512 points
			2.5Mbps	0.7	0.8	1.0
			625kbps	2.2	2.7	3.8
			156kbps	8.0	10.0	14.1
		When 64 Stations Are Connected	Number of Points	256 points	512 points	1024 points
			2.5Mbps	1.2	1.5	2.0
			625kbps	4.3	5.4	7.4
			156kbps	15.6	20.0	27.8
Communication Specifications	Transmission Rate (bps)			2.5M / 625k / 156k		
	Number of Connected Units			64		
	Remote Station Numbers			1 to 64		
	RAS Function			Network diagnostics, internal loopback diagnostics, station detach function automatic return to system		
	Connection Cable			Dedicated flat cable (0.75mm² x 4) CL9-FL4-18		
I/O Device Points Occupied (*1)				16, 32, 48, 64, 128, 256, 512, 1024		
5VDC Internal Current Consumption				0.13 A		
24VDC Power Supply (*2)	Voltage			20.4 to 28.8VDC		
	Current Consumption			0.028 A		
	Current on Startup			0.070 A		
Weight (kg)				0.09		
Base Unit Slots Occupied				1		

Notes: 1. Set by module switches; 2. External supply

MELSEC Q Series AS-i Sensor Level Network Master Module

The AS-i module allows Q Series to control systems that require integration of third party AS-i sensor level network products. The GX Configurator-AS plug in for GX Developer configures the QJ71AS92 module.

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080291	AS-i Master Module User's Manual	Covers QJ71AS92 and GX Configurator-AS	Supplied as a PDF with GX Configurator-AS	-
IB(NA)0800225	AS-i Master Module User's Manual (Hardware) QJ71AS92	Basic information on QJ71AS92	Yes	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Model Number		QJ71AS92
Stocked Item		S
Certification		CE
Max. Number of AS-i System Slaves		62 (Group A: 31, Group B: 31)
Max. Number of I/O Points (1 Point = 16 Bits)	Input	248 points
	Output	248 points
Max. Number of Analog I/O Points (1 Point = 1 Bit)	Input	124 points
	Output	124 points
I/O Refresh Time		Approx. 5 ms (without I/O slave grouping); Approx. 10 ms (with I/O slave grouping); Approx. 35 ms (per analog slave channel)
Communication Speed		167 kbps
Transmission Distance		Max. 100m (Max. 300m by use of two repeaters)
I/O Device Points Occupied		32 points
Connection Cable		Dedicated AS-i cable
External Power Supply	Voltage	TYP. 30.5VDC (supplied by AS-i power supply)
	Current Consumption	46mA (TYP 30.5VDC)
5VDC Internal Current Consumption		0.40A
Weight (kg)		0.12
Base Unit Slots Occupied		1

Energy Measuring Module

The energy measuring module adds energy management capability to a Q Series system. Mount this module on a Q base unit to measure a variety of energy usage, such as current, voltage, power, frequency, etc.

Model Number			QE81WH
Stocked Item			-
Certification			CE
Phase Wire System			Single-phase 2-wire, single-phase 3-wire, 3-phase 3-wire
Instrument Rating	Voltage Circuit	Single-Phase 2-Wire, 3-Phase 3-Wire	110VAC, 220VAC common use
		Single-Phase 3-Wire	110VAC (between wires 1-2, between wires 2-3), 220VAC (between wires 1-3)
	Current Circuit		AC50A, 100A, 250A, 400A, 600A (Dedicated split-type current sensor is used. In all cases, the current sensor's primary current is indicated.)
			AC5A (Dedicated split-type current sensor is used. The 5A current sensor is used in combination with a current transformer (CT) in a two-step configuration. In this case, the maximum primary current setting is 6000A.)
	Frequency		50-60Hz (automatic frequency selection)
Tolerance	Main Unit		Current, demand current (*1): ±1.0% (relative to 100% rating) Voltage: ±1.0% (relative to 100% rating) Power, demand power (*1): ±1.0% (relative to 100% rating) Frequency: ±1.0% (45 to 65Hz range) Power factor: ±3.0% (relative to electrical angle of 90°) Power level: ±2.0% (5 to 120% of rating, power factor = 1) Reactive power level: ±2.5% (5 to 120% of rating, power factor = 0)
Number of Measurement Circuits			1 circuit
Data Refresh Period			250ms (fixed) Note: Constant cumulative count of power level and reactive power level (also includes short-cycle load changes)
Response Time			Backup to non-volatile memory (Saved items: Setting values, max./min. values and their occurrence times, power level (regenerative, consumption), reactive power level, period power level)
Measureable Items (*2, *3)			Current, current demand, voltage, power, demand power, power factor, frequency, eectric energy, reactive energy, term electric energy
Number of Occupied Points			16 points (I/O assignment: intelligent 16 points)
Internal Current Consumption (A)			0.17
Weight (kg)			0.10

Notes:

1. "Demand" is the moving average over the specified time period.
2. Indicates the moving average over the specified time period.
3. When the phase wire system is set to single-phase 2-wire, these parameters are not measured.

Insulation Monitoring Module

Model Number			QE82LG
Stocked Item			-
Certification			CE
Phase Wire System			Single-phase 2-wire, single-phase 3-wire and 3-phase 3-wire systems common use
Instrument Rating	Voltage Circuit (*1, *2)	Single-Phase 2-Wire, 3-Phase 3-Wire	110VAC, 220VAC common use
		Single-Phase 3-Wire	110VAC (between wires 1-2, between wires 2-3), 220VAC (between wires 1-3)
	Current Circuit		AC50A, 100A, 250A, 400A, 600A (Dedicated split-type current sensor is used. In all cases, the current sensor's primary current is indicated.)
			AC5A (Dedicated split-type current sensor is used. The 5A current sensor is used in combination with a current transformer (CT) in a two-step configuration. In this case, the maximum primary current setting is 6000A.)
	Frequency		50-60Hz (automatic frequency selection)
Tolerance	Main Unit		Leakage current ±2.5% (10% to 100% of rating) Resistive-component leakage current ±2.5mA (≤10% of rating) (The resistive-component leakage current does not include electrostatic capacity.)
Number of Measurement Circuits			2 circuits (*3)
Data Refresh Period			Leakage current: 2 sec or less; Resistive-component leakage current: 10 sec or less
Response Time			Leakage current: 4 sec or less; Resistive-component leakage current: 30 sec or less
			Backup to non-volatile memory (Saved items: Setting values, max. value and its occurrence date/time, alarm occurrence times)
Measuring Items	Leakage Current		Current value, Max. value, Occurance date/time of max. value, Number of first stage alarm occurrences, Number of second stage alarm occurrences
	Resistive-Component Leakage Current		Current value, Max. value, Occurance date/time of max. value, Number of first stage alarm occurrences, Number of second stage alarm occurrences
Number of Occupied Points			16 points (I/O assignment: intelligent 16 points)
Internal Current Consumption (A)			0.17
Weight (kg)			0.10

Notes:

1. The module can be connected directly to 110V and 220V. To connect to 440V, an external voltage transformer (VT) is necessary. Leakage current (I0, I0r) cannot be measured without voltage input.
2. I0r can be measured on a single-phase 3-wire or 3-phase 3-wire delta circuit. On special grounded circuits, such as 3-phase 3-wire star circuits, high-resistance grounded circuits and capacitor grounded circuits, only I0 can be measured.*
3. Leakage current (I0 and I0r) of CH1 and CH2 can be measured only on circuits when the voltage input was on the same system.

e-F@ctory

High Speed Data Logger Module

The High Speed Data Logger can manipulate and store large amounts of CPU data in multiple formats on a CF card for access later via FTP, E-mail, or direct. Dedicated software utilities available for download directly from the module's built-in FTP server allow for easy logging setup as well as data analysis.

Model Number			QD81DL96	
Stocked Item			S	
Certification			UL • cUL • CE	
Ethernet (*1) 10BASE-T 100BASE-TX	Data Transmission Rate		10BASE-T 10Mbps	100BASE-TX 100Mbps
	No. of Cascaded Stages		Maximum 4 stages	Maximum 2 stages
	Max. Segment Length (*2)		100m	
Compact Flash Card	Supply Power Voltage		3.3 V±5%	
	Supply Power Capacity		Maximum 150mA	
	Card Size		TYPE I card	
	Number of Card Slots		1 card	
Number of Occupied I/O Points			32 points/slot	
Data Sampling (*3)	Number of Access Target CPUs		Maximum of 64 CPUs	
	Data Sampling Interval (Point)	High Speed Data Sampling	Sequence scan time synchronization; 1 to 32767 ms (for trigger logging) 3 to 32767 ms (for continuous logging)	
		General Data Sampling	0.1 to 0.9 seconds; 1 to 32767 seconds	
	Amount of Sampled Data (*4, *5, *6)	High Speed Data Sampling	Overall amount of data: maximum of 8192 (per setting: 256);Overall number of device points: maximum of 8192 (per setting: 256)	
		General Data Sampling	Overall amount of data: maximum of 16384 (per setting: 256); Overall numbe number of device points: maximum of 262144 (per setting: 4096)	
	Data Type (*7)		Bit, Word (signed), Double word (signed), Word (unsigned), Double word (unsigned), Float (single precision), Float (double precision), 16 bit BCD, 32 bit BCD, String: 1 to 8192 characters, Raw: 1 to 8192 bytes	
	Data Output Format (CSV File) (*8)		Bit, Decimal format, Exponential format, Hexadecimal format, String, Raw	
	Scaling (*9)		Basic arithmetic operations: calculations combining (×, ÷) and (+, -)	
Data Logging	Number of Settings		Maximum of 64 settings (*10)	
	Logging Type		Continuous logging, Trigger logging	
	File Format		CSV file (extension: CSV), Binary file (extension: BIN) (*11)	
	Period		Specify applicable period or exclusion period, Data condition, Date range, Time range, Day of week/week condition, AND or OR combination of the above: up to 8 conditions (*12)	
	Trigger Logging	Trigger Conditions	Data condition: bit ON/OFF, compare data to constant value, compare data to data, Data change, Fixed cycle: 1 to 86400 seconds, Time of day specification: specify month/day/hour/minute/second, At module startup, AND or OR combination of the above: up to 8 conditions (*12), Condition execution count: 3 conditions (*12), Condition execution order (order and/or time conditions): up to 4 conditions (*12)	
		Number of Logging Rows	Before trigger occurs: 0 to 32767 lines; After trigger occurs: 1 to 32767 lines	
	File Switching Timing		Number of lines (number of records) specification: 100 to 65535 lines, File size specification, Data condition, compare data to data, Data change, Fixed cycle, Time of day specification, At module startup, Trigger logging unit	
	Max. Number of Files Saved		65535	
Event Logging	Number of Settings		Maximum of 64 settings (*10)	
	Number of Events		Maximum of 64 events per single event logging setting	
	File Format		CSV file (extension: CSV); Binary file (extension: BIN)	
	Event Conditions		Data condition, compare data to data, Data change, AND or OR combination of the above: up to 4 conditions, Condition execution count: 3 conditions, Condition execution order (order and/or time conditions): up to 4 conditions	
	Period		Data condition, Date range, Time range, Day of week/week condition, AND or OR combination of the above: up to 8 conditions (*13)	
	File Switching Timing		No. of rows (no. of records), File size specification, Data condition, Data change, Fixed cycle, Time of day, at module startup	
	Number of Files Saved		65535	
Report	Number of Settings		Maximum of 64 settings (*10)	
	File Format		Excel format (extension: xls)	
	Output Data Type		Data inside data logging file (*14), Current value data, Creation time	
	Amount of Output Data		64 layouts per single report setting, 65535 cells in total	
	Creation Trigger Conditions		Data condition, Data change, Fixed cycle, Time of day specification, At module startup, AND or OR combination of the above: up to 8 conditions (*12), Condition execution count: 3 conditions (*12), Condition execution order (order and/or time conditions): up to 4 conditions (*12), At the time of the data logging file is switched	
	Period		Data condition, Date range, Time range, Day of week/week condition, AND or OR combination of the above: up to 7 conditions (*12)	
	Layout File Size		Maximum of 10MB (total of all report settings)	
	Max. Number of Files Saved		65535	

Note: Continued on next page.

High Speed Data Logger Module (continued)

Model Number			QD81DL96
E-Mail	Subject		user specified; automatically created
	Body		user specified; automatically created
	Attachment		Saved file transmission e-mail: Saved file (CSV, binary, or Excel file); Maximum of 512KB
	Attachment Format		MIME 1.0
	Communications with Mail Server	Port No.	25, 587, other (1 to 65535)
		Authentication Method	No authentication, SMTP-AUTH (PLAIN, LOGIN, CRAM-MD5), POP before SMTP
	Target Address		16 groups max.
	Operability Verified E-Mail Client Software		Microsoft® Outlook® Express 6.0, Microsoft Windows® Mail 6.0
FTP Server (*15)	Application		Read and delete saved files
	Operability Verified FTP Client Software		Microsoft Internet Explorer® 6.0; Windows Internet Explorer 7.0
	Session Count (*16)		10
FTP Client (*17)	Application		Transfer saved files
	Operability Verified FTP Server Software		Microsoft Internet Information Services
Data Viewer Software	Displayable Data		Data sampled with the data logging function (realtime display, historical display), Data sampled with the event logging function (realtime display, historical display)
	Number of Displayable Windows		Maximum of 4 windows (*18)
	Number of Windows Which can be Monitored in Real Time		Maximum of 2 windows for 1 high speed data logger module (*19)
	Graph Lines		Maximum of 32 lines per trend window
	Realtime Trend Data		Maximum of 10000 plots
	Realtime Event Data		Maximum of 2000
Internal Current Consumption (5VDC)			0.46A
Weight (kg)			0.15
Base Unit Slots Occupied			1

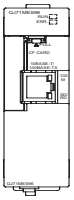
Notes:

1. The high speed data logger module distinguishes 10BASE-T from 100BASETX depending on the device on other end. For connection with a hub not having the auto-negotiation function, set the hub side to half-duplex auto communication mode.
2. Distance between a hub and node.
3. The specification for target data sampling with the data logging function, event logging function, and report function.
4. The number of device points available for 1 piece of data depends on the data type.
5. The total number of data logging, event logging, and report data.
   - Data logging : logging target data, trigger condition data, period condition data, file switching condition data, saved file name data
   - Event logging: monitoring data, period condition data, file switching condition data, saved file name data
   - Report : current value data, creation trigger condition data, period condition data, saved file name data
6. The amount of sampled data per single setting is as follows only when the creation trigger and current value data are not synchronized with the report setting. Amount of data (per single setting): maximum of 65535, number of device points (per single setting): maximum of 65535.
7. The data type when reading data from the programmable controller CPU's device memory.
8. The format when outputting data to a CSV file with data logging or event logging. Binary files are output in the binary format. Reports are output in Excel cell format.
9. A function to perform data scaling and offset calculations.
10. Up to 64 settings can be configured for data logging, event logging, and report function combined. Of these, up to 32 settings can be configured for data logging, event logging, and report function when high speed data sampling is specified.
11. By using the report function, data can be re-output in the Excel file format.
12. When high speed data sampling is specified, period and trigger conditions combined up to 4 conditions. When general data sampling is specified, period and trigger conditions combined up to 8 conditions.
13. When high speed data sampling is specified, up to 4 conditions.
14. Only binary format data logging can be output to report function.
15. A function to access the high speed data logger module (FTP server) from a personal computer's FTP client software. For details of supported FTP commands, refer to Appendix 9.
16. The upper limit of the number of simultaneous connections to the high speed data logger module from FTP client software. FTP client software may use multiple connections per single access session.
17. A function to access a personal computer's FTP server software from the high speed data logger module (FTP client).
18. Up to 4 windows can be displayed, consisting of the realtime trend window, historical trend window, realtime event window, and historical event window.
19. Up to 2 windows can be displayed, consisting of the realtime trend window and realtime event window.

CompactFlash Specifications

Model Number	QD81MEM-512MBC	QD81MEM-1GBC	QD81MEM-2GBC	QD81MEM-4GBC	QD81MEM-8GBC
Stocked Item	S	S	-	-	-
Memory Capacity	512MB	1GB	2GB	4GB	8GB
Number of Insertions / Ejections	10,000 cycles				
External Dimensions (W x W x D) mm	43 x 36 x 3.3				
Weight (g)	12				

MELSEC Q Series Standard MES Interface Module



As part of Mitsubishi's e-F@ctory technology, the QJ71MES96 module allows a direct connection from a Q Series Automation Platform controller on the shop floor to high level IT MES (Manufacturing Execution Systems) infrastructure. This offers the following benefits:

- No need for intermediate PC infrastructure to interface shop floor controllers to "front office" IT systems
- Significantly reduced cost of ownership as no PC maintenance issues apply
- Improved security; prevents access by unauthorized personnel
- Improved productivity; industrially hardened architecture is immune to typical PC reliability issues
- High speed Ethernet connection from shop floor to "front office" IT systems
- Convenient installation; module simply mounts in a spare Q Series slot and configures with dedicated software tool (MX-MESIF-STD-C1)

Required Manuals for QJ71MES96

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800354	QJ71MES96 MES Interface Module User's Manual (Hardware)	Basic information on QJ71MES96 module	Yes	-
SH(NA)080644	QJ71MES96 MES Interface Module User's Manual	Complete information on how to use the MES interface module and associated software	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Performance Specifications

Model Number		QJ71MES96	
Stocked Item		S	
Certification		UL • cUL • CE	
Ethernet	**Interface (*1)**	10BASE-T	100BASE-TX
	Data Transmission Rate	10 Mbps	100 Mbps
	Number of Cascaded Stages	Maximum 4 stages	Maximum 2 stages
	Max. Segment Length (*2)	100 m	
I/O Device Points Occupied		32 points/slots	
5VDC Internal Current Consumption		0.65A	
Weight (kg)		0.16	
Base Unit Slots Occupied		1	

Notes:

1. The MES interface module distinguishes 10BASE-T from 100BASE-TX depending on the device on other end. For connection with a hub not having the auto-negotiation function, set the hub side to half-duplex auto communication mode.
2. Distance between a hub and node.

Q Series MES Interface IT Module

The MES Interface IT and e-F@ctory technology solves the difficult challenge of efficiently linking factory and IT systems to enable comprehensive data collection and distribution. It achieves system standardization security, and high data reliability for any system from individual machines to large scale production lines.

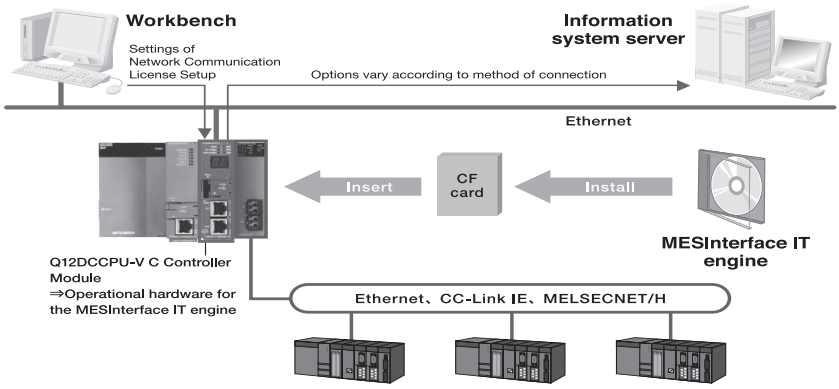
- Access to accurate and reliable production information
- Dramatically simplified system architecture
- Reduced integration time and effort
- Improved security and standardization
- Achieves lean and agile operation at the lowest cost of ownership

The MES Interface IT module is a communication interface between IT assets and plant floor equipment.

Each MES Interface IT system should have a minimum of one module and one transport. A transport is added to the module so the module knows how to talk to a database or message queue system. Additional transports can be purchased at anytime.

Mitsubishi Electric MELSEC drivers are included with the purchase of the module. Other drivers are available as options if the module needs to share information with legacy MELSEC or third party controllers.

Device connections refer to the number of controllers or other devices the MES Interface IT module will communicate with. The example to the left has four controllers (one is the local CPU and the other three are networked). The module comes with five device connections. Additional connections can be purchased at anytime.



	Model Number	Description	Stocked Item
Included items	QJ71MES96IT	Q Series C Language CPU, 128MB	S
		MES IT DeviceWise Core	
		MES IT 2GB CF Memory Card	
		MES IT 5 Device Connections	
		MES IT Mitsubishi (EZ Socket) Driver	
Extra Device Connections	MESITDVC-5	MES IT 5 Device Connections	S
	MESITDVC-10	MES IT 10 Device Connections	S
Transports / Databases	MESITLCLDTBS	MES IT Local Database	S
	MESITTRNSORCL	MES IT Oracle Transport + Local Database	S
	MESITTRNSSQL	MES IT SQL Transport + Local Database	S
	MESITTRNSDB2	MES IT DB2 Transport + Local Database	S
	MESITTRNSMQTT	MES IT MQTT Transport + Local Database	S
	MESITTRNSSIB	MES IT SIB Transport + Local Database	S
	MESITTRNSWMQ	MES IT WMQ Transport + Local Database	S
	MESITTRNSPSQL	MES IT Postgre SQL Transport + Local Database	S
	MESITTRNSRDM	MES IT RDM Transport + Local Database	S
Drivers	MESITDRVMMC	MES IT Mitsubishi (MC Protocol) Driver	S
	MESITDRVRAPLC	MES IT Rockwell Driver (SLC, PLC5, MicroLogix)	S
	MESITDRVRALGXTG	MES IT Logix Tag Driver	S
	MESITDRVSMNSS7	MES IT Siemens S7 Driver	S
	MESITDRVHWKEYE	MES IT Siemens HAWKEYE Driver	S
	MESITDRVOMRON	MES IT OMRON Driver	S
	MESITDRVALIEN	MES IT ALIEN Driver	S
	MESITDRVBANNR	MES IT BANNER Driver	S
	MESITDRVEMS	MES IT EMS Driver	S
	MESITDRVMBUS	MES IT Modbus Driver	S
Spare Parts	MESIT2GBCF	Spare MES IT 2GB CF Memory Card	S

Performance Specifications

Data Transport Method	**Databases**	Oracle 10g, 11g; Microsoft SQL Server 2000, 2005, 2008; IBM DB2 8,9; IBM DB2/400 V5R3; Local DB
	Messages	MSMQ; WMQ; WMQTT; WebSphere MQ; JMS; SAP; SMTP (e-mail); TCP; HTTP
Data Transport Map	**SQL Commands Supported by the Database Interface Function**	Insert; Batch Insert; Update; Select; Delete; Select with Delete; Select with Update; Stored Procedure; CountRows
	Message Style	ASCII (delimited format, free format), XML
	Character Code	UTF-8
	Max. Store and Forward Capacity	10,000MB/transport. However, the volume actually used does not exceed the capacity of a CompactFlash card (512MB)
Trigger	**Trigger Conditions**	Fixed cycle (Schedule-Periodic); Fixed time (schedule); Value monitoring (Data); Listener (Listener); Manual operation (On Demand); Boot from separate trigger (Sub Trigger); MES Interface IT event (Internal); Top management communication event (Enterprise); Event from separate system with multiple CPUs (GINT command)
	Actions	Numerical processing (referencing other numerical operations) (Expression); Standby (Wait); Device writing (Set); Array operation (Array); Bit operation (Bit); Device control (Device); Communication from top management (Enterprise Communication); Setting display (Hardware); Correction of internal data (internal); PING operation (Ping); Job control (Routing); File operation (Staging File System); Character string operation (String); Boot trigger (Trigger)
	Operations	Four arithmetic operation (+, -, x. /); abs (absolute value); acos (inverse cosine); asin (inverse sine); atan (inverse tangent); avg (average); cos (cosine); cosh (hyperbolic cosine function); exp (exponential function); ln (natural logarithm); log (logarithmic function); log10 (common logarithm); max (maximum value); min (minimum value); sin (sine); sinh (hyperbolic sine function); sqrt (square root); sum (total); tan (tangent); tanh (hyperbolic tangent function)

F. Accessories

MELSEC Q Series Programming Cables

Depending on the CPU type being used, either a serial or USB connection can be made to a CPU from a PC as follows:

CPU	Connections Available	Cable to Use
Q00J, Q00, Q01, Q02	Serial RS-232	SC-Q (serial connection)
Q02H, Q06H, Q12H, Q25H, Q12PH, Q25PH	Serial RS-232 & USB (Type B)	SC-Q (serial connection) or third party USB cable (Type B)
Q00UJ, Q00U, Q01U,Q02U,Q03U, Q04U, Q06U, Q10U, Q13U, Q20U, Q26U, Q50U, Q100U	USB (Mini-B) and RS-232/Ethernet	GT09-C30USB-5P, Third party USB (Mini-B) or Ethernet SC-Q / Cat5e (RJ45 connector)

MELSEC Q Series Slot Filler Module

In some cases it is not possible to fill all the slots on a rack. Where unused slots exist, there is a risk of system damage caused by extraneous material entering the backplane or system modules via the unused slot positions. The QG60 module is an empty single slot module case that fits in an unused slot to protect from possible contamination. Since the QG60 contains no electronic components, it does not affect the system configuration, power consumption or programming.

MELSEC Q Series / iQ Memory Cards

Q Series memory cards are optional memory expansions. Use these cards to expand the CPU memory up to 32Mb. Memory cards may be used for storage of programs, data and system documentation. Note these are only used with sequence CPUs. Program memory is not increased by adding memory cards.

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080484	QCPU(Q Mode) User's Manual (Function Explanation, Program Fundamentals)	CPU specifications, system configuration, Programming basics, I/O assignments, memory organization, CPU functions, communication with intelligent function modules, parameters & devices, program up/downloads, overview of multiple program architecture, programming basics	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Memory Cards Supported Data and Compatibility

Drive No.	Memory Card (RAM)	Memory Cards (ROM)		File Name and Extension
	SRAM Card	Flash Card	ATA Card	
	Q2MEM-1MBS Q2MEM-2MBS Q3MEM-4MBS Q3MEM-8MBS	Q2MEM-2MBF Q2MEM-4MBF	Q2MEM-8MBA Q2MEM-16MBA Q2MEM-32MBA	
Parameter	X	X	X	PARAM.QPA
Intelligent Function Module Parameter	X	X	X	IPARAM.QPA
Program	X (*1)	X (*1)	X (*1)	***.QPG
Device Comment	X (*2)	X (*2)	X (*2)	***.QCD
Device Initial Value	X	X	X	***.QDI
Device Data	-	-	-	***.QST
File Register	X	X (*3)	-	***.QDR
Local Device	X	-	-	***.QDL
Sampling Trace File	X	-	-	***.QTD
Failure History Data	X	-	-	***.QFD
PLC User Data	-	-	X	***.***

For program storage only.
Does not increase program memory.

Notes:
1. To execute the program stored in the standard ROM or memory card, adjusting the program memory boot settings is required in the PLC parameter dialog box. Note that the Universal model QCPU cannot boot data from the standard ROM to the program memory.
2. Read from a sequence program requires several scans.
3. Read only from a sequence program.

Memory Card		CPU Module				
		Base Q CPUs	High Performance CPUs	Process CPUs	Redundant CPUs	Universal QnU CPUs
SRAM Card	Q2MEM-1MBS	-	X	X	X	X
	Q2MEM-2MBS	-	X	X	X	X
	Q3MEM-4MBS	-	-	-	-	X
	Q3MEM-8MBS	-	-	-	-	X
Flash Card	Q2MEM-2MBF	-	X	X	X	X
	Q2MEM-4MBF	-	X	X	X	X
ATA Card	Q2MEM-8MBA	-	X	X	X	X
	Q2MEM-16MBA	-	X	X	X	X
	Q2MEM-32MBA	-	X	X	X	X

Note: Only one memory card can be installed for each CPU module.

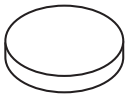
Type	Memory Type	Capacity	Write Count (Times)	Certification	Stocked Items
Q2MEM-1MBS	SRAM	1,011kb	No restriction	UL • cUL • CE	S
Q2MEM-2MBS	SRAM	2,034kb	No restriction	UL • cUL • CE	S
Q2MEM-2MBF	Linear flash ROM	2,032kb	100,000	UL • cUL	S
Q2MEM-4MBF	Linear flash ROM	4,080kb	100,000	UL • cUL	-
Q3MEM-4MBS	SRAM	4,078kb	No restriction	UL • cUL • CE	-
Q3MEM-4MBS-SET	Set consisting of Q3MEM-4MBS & protective cover	N/A	N/A	UL • cUL • CE	-
Q2MEM-8MBA	ATA flash ROM	7,940kb	1,000,000	UL • cUL	S
Q3MEM-8MBS	SRAM	8,172kb	No restriction	UL • cUL • CE	-
Q3MEM-8MBS-SET	Set consisting of Q3MEM-8MBS & protective cover	NA	N/A	UL • cUL • CE	-
Q2MEM-16MBA	ATA flash ROM	15,932kb	1,000,000	UL • cUL	-
Q2MEM-32MBA	ATA flash ROM	31,854kb	1,000,000	UL • cUL	-

Note: Both the linear flash ROM and ATA flash ROM are rewritable non-volatile memories. For replacement memory card back-up batteries, please see the Accessories section.
For certain sequence CPU functions to be enabled, specific types of memory card are required. Please refer to the relationship between memory cards and supported data type to select the memory card that best meets your needs.

MELSEC Q Series Memory Card Adapter

The Q2MEM-ADP adapter allows a Q Series memory card (Q2MEM-_MB_) to be installed in a standard PC Card (PCMCIA) slot for reading and writing to the card. Non-Stock product.

MELSEC Q Series Memory Card Replacement Battery

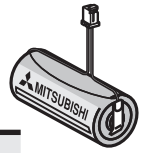


Use these batteries to maintain the contents of SRAM memory cards after power down.

Model Number	Q2MEM-BAT	Q3MEM-BAT
Stocked Item	S	-
Classification	Graphite fluoride lithium primary battery	Manganese dioxide lithium primary battery
Initial Voltage	3.0V	3.0V
Nominal Current	48mAh	550mAh
Storage Life	5 years (room temperature)	
Lithium Content	0.014g	0.150g
Application	Power failure backup for SRAM card (for Q2MEM-1MBS/Q2MEM-2MBS)	Power failure backup for SRAM card (for Q3MEM-4MBS/Q3MEM-8MBS)

MELSEC Q Series CPU Memory Replacement Battery

All Q Series CPUs employ RAM based memory. To insure this is preserved after power down, use the Q6BAT or Q7BAT. Note these are not compatible with the A6BAT. Any RAM based memory cards installed in the CPU use the Q2MEM-BAT for back-up and are independent of the Q6BAT. One Q6BAT is shipped with each CPU.

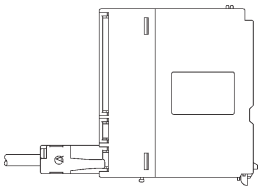


Model Number	Q6BAT			
Stocked Item	S			
Battery Lifetime	CPU Type	Min. Back-Up Time	Typical Back-Up Time	Back-Up Time After Battery Error ON
	Basic Q CPUs	5,433 hours	13,120 hours	120 hours
	Q02H, Q06H	2,341 hours	6,435 hours	120 hours
	Q12H, Q25H, Q12PH, Q25PH	1,260 hours	4,228 hours	48 hours

Model Number	Q7BAT/Q7BAT-SET			
Stocked Item	S			
Battery Lifetime	CPU Type	Min. Back-Up Time	Typical Back-Up Time	Back-Up Time After Battery Error ON
	Q02	13,000 hours	31,000 hours	240 hours
	Q02H, Q06H	5,000 hours	14,000 hours	240 hours
	Q12H, Q25H, Q12PH, Q25PH	2,900 hours	9,700 hours	96 hours

MELSEC Q Series Connector Disconnection Prevention Holder

The Q6HLD-R2 is a clamp that fixes a cable securely to the RS-232 port of a Q Series CPU to prevent accidental disconnection. It is adjustable to accommodate different cable designs and does not block access to the USB port, where available



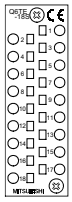
Model Number	Q6HLD-R2
Stocked Item	-
Required Manuals	IB(NA)0800181 Included

MELSEC Q Series Spare Parts

Model Number	Description	Stocked item
BKO-C8834H12	Spare CC-Link terminating resistors 2 x 110Ω, 2 x 130Ω, fitted with insulated lugs	-
BKO-C10798H02	QJ61BT11N CC-Link network master module network connection terminal block	-
K08H07500150	QXn0/QYn0 I/O block complete terminal block assembly (screw terminal block, hinged cover and label) (Fits QX10, QY10, etc.)	-
K08H07500151	Hinged cover and label only from K08H07500150	-

MELSEC Q Series Spring Clamp Terminal Block

The Q6TE-18S fits most Q Series 16 point (or less) I/O modules and allows terminations to be made via a spring clamp. This offers the benefit of making wiring connections without using wiring lugs.



Model Number	Q6TE-18SN
Stocked Item	S
Required Manuals	IB(NA)0800476 Included

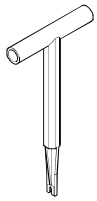
MELSEC Q Series IDC Terminal Block Adapter

The Q6TA32 allows some I/O modules to offer an IDC (insulation displacement connector) type wiring connection. This makes wiring less expensive and faster, as wires do not need to be stripped or have a lug fitted. Wire is simply pushed into the receptacles on the adapter, and held firmly by the IDC connection.

Model Number	Q6TA32
Stocked Item	-
Required Manuals	IB(NA)0800228 Included

MELSEC Q Series IDC Insertion Tool

Use the Q6TA32-TOL to fit wires into the IDC receptacles of the Q6TA32.

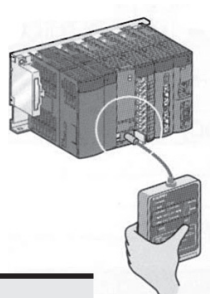


Model Number	Q6TA32-TOL
Stocked Item	-

MELSEC Q Series Program Loader EQLDR01

The EQLDR-01 program loader provides a convenient handheld device that can be used to upload, store, transfer and download programs for Basic Q CPUs that do not have a memory card slot. The EQLDR-01 also accepts standard off the shelf compact flash memory cards for inexpensive transfer of programs from one loader to another.

CPU Connection



Required Manuals

Model Number	Description	Stocked Item
50EM8508-A	EQLDR01 User's Manual	-

Note: Many of these manuals are available by free download from our website, www.meau.com

Model Number		EQLDR01
Stocked Item		-
Interface	Transmission Speed	115.2Kbps
	Cable Length	0.2m
Power Supply		Received from CPU (5VDC)
Current Consumption (5VDC)		0.31A
Weight (kg)		0.14
External Dimensions (Excluding Cable) W x H x D mm (in)		75 x 110 x 27.5 (2.95 x 4.33 x 1.08)
Maximum Processing Time of Each Mode		See table below

		Q00JCPU	Q00CPU	Q01CPU
CPU WR	Internal Memory	about 37s	about 93s	
	Compact Flash™ Card	about 36s	about 96s	
CPU RD	Internal Memory	about 24s	about 58s	
	Compact Flash™ Card	about 21s	about 54s	
MEM.-CF		about 2s	about 3s	
CF-MEM.		about 5s	about 7s	
MEM.CLR.		about 6s		
CF CLR.*		about 2s (The processing time differs according to capacity.)		

*With Compact Flash™ card capacity of 32 MB

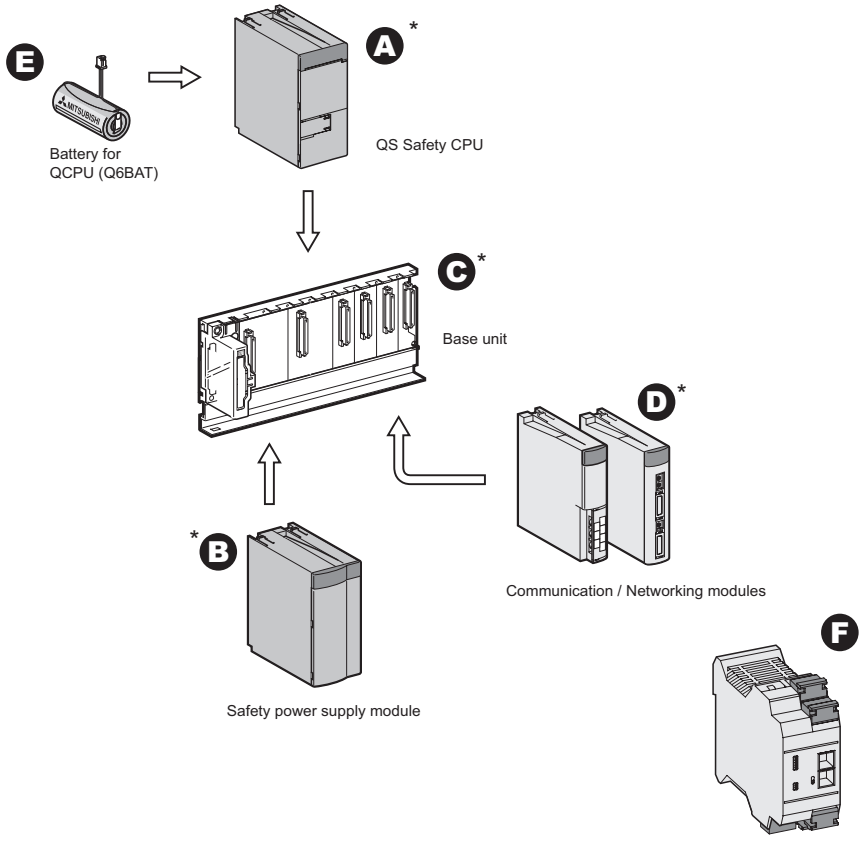
MELSEC QS Safety

The MELSEC Safety lineup provides innovative solutions to applications requiring accident-free user operation. For Category 4 Safety control, the QS Safety PLC uses TÜV certified function block programming and CC-Link Safety to integrate both safety and non-safety assets into a single seamless system. Safety rated Light Curtains, Electromechanical Switches, and Laser Scanners can all be incorporated to minimize danger to the operator. Another way to add safety control to a non-safety system is by using the Safety Relay Modules, which provide independent Category 3 Safety I/O control and can be monitored via the Q Bus or standard CC-Link.

Key Features:

- QS PLC is TÜV certified to IEC61508 SIL 3 & ISO13849-1 Category 4
- Safety Function Blocks included with standard GX Developer programming software for easy failsafe programming
- Reduced wiring costs using CC-Link Safety device level network for both Safety and Non-Safety I/O
- Built-in User Management to the programming environment for different levels of user access
- QS PLCs have Test Mode and Safety Mode for easy pre-commission trouble-shooting
- Safety Relay Modules are easily integrated with existing control systems
- Safety Relay Modules require no programming and an optional partial system shutdown feature

System Configuration



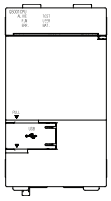
* Minimum requirements

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080626	QSCPU User's Manual (Hardware Design, Maintenance & Inspection)	Overview, system configuration, general specifications, CPU module, power supply module, base unit, battery, startup, EMC & LVD, loading & installation, maintenance & inspection, troubleshooting	No (purchase separately)	-
SH(NA)080627	QSCPU User's Manual (Function Explanation, Program Fundamentals)	Overview, performance specifications, sequence program execution, I/O assignment, memory & file handling, functions, communication with IFM, parameters, devices, procedures for writing programs to CPU	No (purchase separately)	-
SH(NA)080628	QSCPU Programming Manual (Common Instructions)	General description, instruction tables, configuration of instructions, how to read instructions, sequence instructions, basics instructions, application instructions, QSCPU dedicated instructions, error codes	No (purchase separately)	-
IB(NA)0800340	QSCPU Module User's Manual (Hardware)	Overview, specifications, EMC & LVD, loading & installation, error codes, transportation precautions	Yes	-
SH(NA)080613	Safety Application Guide	Overview, application example, risk assessment & safety level, precautions for the use of safety PLCs, safety application example	No (purchase separately)	-
IB(NA)0800344E	CC-Link Safety System Master Module User's Manual (Hardware)	Overview, specifications, mounting & installation, part names & settings, external wiring, external dimensions	Yes	-
SH(NA)080600	CC-Link Safety System Master Module User's Manual	Overview, system configuration, specifications, functions, data link processing time, parameter setting, procedure before starting, programming specifications, troubleshooting	No (purchase separately)	-
IB(NA)0800345E	CC-Link Safety System Remote I/O Module User's Manual (Hardware)	Overview, specifications, part names & settings, mounting & installation, wiring, external dimensions	Yes	-
SH(NA)080612	CC-Link Safety System Remote I/O Module User's Manual	Overview, system configuration, specifications, functions, parameter setting, procedures & settings, programming, maintenance & inspection, troubleshooting	No (purchase separately)	-

Note: Many of these manuals are available by free download from our website, www.meau.com

A. MELSEC QS Safety CPU Specifications

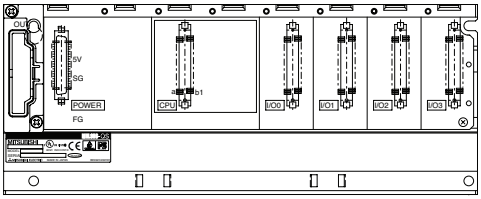


Model Number		QS001CPU
Stocked Item		S
Processing Speed (Sequence Instruction)	LD X0	0.10 µs
	MOV D0 D1	0.35 µs
Program Capacity (*1)		14k steps (56k bytes)
Memory Capacity (*1)	Program Memory (Drive 0)	128k bytes
	Standard ROM (Drive 4)	128k bytes
Max. Number of Files Stored	Program Memory	3 (*2)
	Standard ROM	3 (*2)
Maximum I/O Device Points		6144 points (X/Y0 to 17FF)
Maximum Physical I/O points		1024 points (X/Y0 to 3FF)
Maximum Expansion		4 Communication / Networking modules
Communication Ports		USB (B-Type), RS-232
5VDC Internal Current Consumption		0.43A
Weight (kg)		0.29
Protection Of Degree		IP2X

Notes:

1. The maximum number of executable sequence steps is as follows. (Program capacity) - (File header size (default: 34 steps)) For the details, refer to the QSCPU User's Manual (Function Explanation, Program Fundamentals)
2. Parameter, sequence program, SFC program, and device comment files can be stored.

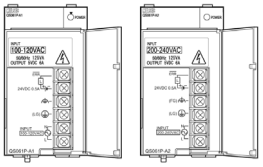
B. MELSEC QS Safety Base Unit Specifications



Model Number	QS034B-E
Stocked Item	S
Expansion Slots (Excluding CPU Slot)	4
Applicable Intelligent Function Modules	QS and Q Series communication/networking modules (*1)
5VDC Internal Current Consumption	0.095A
Weight (kg)	0.28
External Dimensions W x H x D mm (in)	245 x 98 x 44.1 (9.65 x 3.86 x 1.74)

Note: Only CC-Link Safety, CC-Link IE, MELSECNET/H and Ethernet modules can be connected.

C. MELSEC QS Safety Power Supply Specifications



QS061P-A1 QS061P-A2

Model Number		QS061P-A1	QS061P-A2
Stocked Item		S	-
Applicable Base Unit		QS034B-E	
Input Power Supply		100 to 120VAC +10% -15%	200 to 240VAC +10% -15%
Input Frequency		50/60Hz ±5%	
Input Voltage Distortion Factor		Within 5%	
Max. Input Apparent Power		125VA	
Inrush Current		20A within 8ms (*2)	
Rated Output Current	5VDC	6A	
Allowable Momentary Power Failure Period (*1)		Within 20ms	
Operation Indication		LED indication (Normal: ON (green), Error: OFF)	
Weight (kg)		0.40	

Notes:
1. Allowable momentary power failure period
   - An instantaneous power failure lasting less than 20ms will cause AC down to be detected, but operation will continue.
   - An instantaneous power failure lasting in excess of 20ms may cause the operation to continue or initial start to take place depending on the power supply load.
2. Inrush current. When power is switched on again immediately (within 5 seconds) after power-off, an inrush current of more than the specified value (2ms or less) may flow. Reapply power 5 or more seconds after power-off. When selecting a fuse and breaker in the external circuit, take account of the blowout, detection characteristics and above matters.

D. Intelligent Function Modules

The QS Safety PLC can be used with the CC-Link Safety Master, MELSECNET/H, CC-Link IE Field and Ethernet intelligent function module.

MELSEC QS CC-Link Safety Network Master Specifications

Model Number		QS0J61BT12				
Stocked Item		S				
Transmission Rate		Select from 156kbps/625kbps/2.5Mbps/5Mbps/10Mbps				
Maximum Overall Cable Distance (Maximum Transmission Distance)		1200 meters at 156kpp, 100 meters at 10Mbps				
Maximum No. of Connectable Modules		64 modules				
Maximum No. of Link Points Per System		Remote I/O (RX, RY) : 2048 points • Remote register (RWr) : 256 points (remote device stationmaster station) Remote register (RWw): 256 points (master remote device station)				
Link Points Per Remote Station	Station Type	Safety remote station	Standard remote station			
	Number of Occupied Stations	1 station	1 station	2 stations	3 stations	4 stations
	RX	32 points	32 points	64 points	96 points	128 points
	RY	32 points	32 points	64 points	96 points	128 points
	RWr	0 points	4 points	8 points	12 points	16 points
	RWw	0 points	4 points	8 points	12 points	16 points
Recommended Connection Cable		Version 1.10 compatible CC-Link dedicated cable (*1)				
I/O Device Points Occupied		32 points				
5VDC Internal Current Consumption		0.46A				
Weight (kg)		0.12				
Base Unit Slots Occupied		1				

Note:
1. Use BA1SJ61-S or -P certified CC-Link cable and appropriate terminating resistors.

CC-Link IE Field Safety Interface

Model Number		QS0J71GF11-T2
Stocked Item		S
Number of Connectable Stations per Network	Master Station (Safety Station)	1 station (Up to 120 slave stations can be connected to the master station (safety station))
	Local Station (Standard Station)	120 stations
Number of Connectable Safety Stations per Network		32 stations
Maximum Number of Networks		239
Maximum Number of Safety Connections per Station	Asynchronous Mode	31 connections
	Synchronous Mode	8 connections
Number of Safety Inputs/ Outputs per Safety Connection	Input	8 words
	Output	8 words
Ethernet	Communication Speed	1Gbps
	Network Topology	Line topology, star topology (Coexistence of line topology and star topology is possible), and ring topology
	Connection Cable	An Ethernet cable that meets the 1000BASE-T standard: Category 5e or higher (double shielded, STP), straight cable
	Maximum Station-to-Station Distance	100m max. (Compliant with ANSI/TIA/EIA-568-B (Category 5e))
	Overall Cable Distance	• Line topology: 12000m (when cables are connected to 1 master station and 120 slave stations) • Star topology: Depends on the system configuration. • Ring topology: 12100m (when cables are connected to 1 master station and 120 slave stations)
	Number of Cascade Connections	Up to 20
Number of Occupied I/O Points		32 points (I/O assignment: Intelligent 32 points)
Internal Current Consumption (5VDC)		0.85A
External Dimensions (W x H x D) mm		27.4 x 98 x 115
Weight (kg)		0.18

Note:

1. For transmission delay time or other specifications, refer to the MELSEC-QS CC-Link IE Field Network Master/Local Module User's Manual

MELSEC QS CC-Link Safety Remote I/O Module Specifications

Model Number		QS0J65BTB2-12DT			
Stocked Item		S			
Input Specifications			Output Specifications		
No. of Input Points		8 points (Input terminals: 16 points (*2))	No. of Output Points		4 points (source + sink) or 2 points (source + source)
Rated Input Voltage		24VDC	Rated Load Voltage		24VDC
Rated Input Current		Approx. 4.6mA	Operating Load Voltage Range		19.2V to 28.8VDC (Ripple ratio: 5% or less)
Operating Voltage Range		19.2V to 28.8VDC (Ripple ratio: 5% or less)	Max. Load Current		0.5A/point
ON Voltage / ON Current		15VDC/2mA or more	Leakage Current at OFF		0.5mA or less
OFF Voltage / OFF Current		5VDC/0.5mA or less	Max. Voltage Drop at ON		1.0VDC or less
Input Type		Negative common (source)	Output Type		Source + sink type; Source + source type
Response Time	OFF - ON	0.4ms or less (at 24VDC)	Response Time	OFF-ON	0.4ms or less (at 24VDC)
	ON - OFF	0.4ms or less (at 24VDC)		ON-OFF	0.4ms or less (at 24VDC)
Safety Remote Station Input Response Time		32ms or less + filtering time (1ms, 5ms, 10ms, 20ms, 50ms)	Safety Remote Station Output Response Time		32ms or less
External Power Supply	Voltage	19.2V to 28.8VDC (Ripple ratio: 5% or less)			
	Current	60mA (24VDC, with all points ON, excepting for external load current)			
Points / Common		16 input points/common, 4 output points/common (Terminal block 2-wire type)			
Common Current		Max. 4A (Total of inputs and outputs)			
No. Of Stations Occupied		1 station			
Safety Refresh Response Processing Time		38ms			
Module Power (*1)	Voltage	19.2V to 28.8VDC (Ripple ratio: 5% or less)			
	Current	140mA or less (24VDC, with all points ON)			
	Momentary Power Failure Period	10ms or less			
Level of Protection		IP2X			
Connection Type		Screw Terminal			
Weight (kg)		0.67			
Dimensions (W x H x D) mm		197 x 65 x 74.5			

Notes:

1. The power supply connected to the QS0J65BTB2-12DT must satisfy the following conditions: (1) Reinforced insulation SELV (Safety Extra Low Voltage): Hazardous potential part (48V or more) (2) Compliance with the LVD (Low Voltage Directive) (3) Output voltage within 19.2V to 28.8VDC (Ripple ratio: 5% or less.)
2. Two inputs terminals are assigned for each input since redundant wiring is supported.

MELSEC QS CC-Link Safety Remote I/O Module Specifications

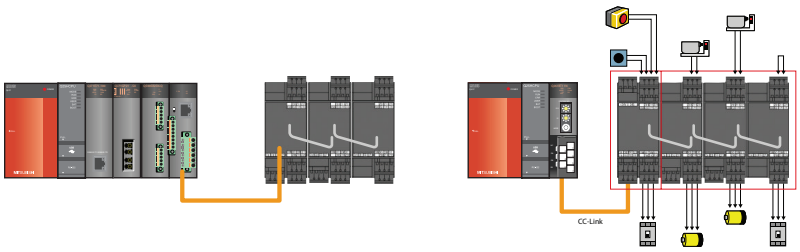
Model Number		QS0J65BTS2-8D	QS0J65BTS2-4T
Stocked Item		S	S
Number of I/O Points		Input: 8 points (input terminals: 16 points) (*2)	Output: 4 points (source + sink), or 2 points (source + source)
Rated Input Voltage		24VDC	-
Rated Input Current		Approx. 5.9 mA	-
Rated Load Voltage		-	24VDC
Operating Load Voltage Range		19.2 to 28.8VDC (ripple ratio: 5% or less)	
ON Voltage / ON Current		15VDC or more / 2mA or more	-
OFF Voltage / OFF Current		5VDC or less / 0.5 mA or less	-
Max. Load Current		-	0.5 A/point
Leakage Current at OFF		-	0.5 mA or less
Max. Voltage Drop at ON		-	1.0VDC or less
Input Type		Negative common (source type)	-
Output Type		-	Source + sink type, Source + source type
Response Time	OFF - ON	0.4 ms or less (at 24VDC)	
	ON - OFF	0.4 ms or less (at 24VDC)	
Safety Remote Station Input Response Time		11.2 ms or less + time of noise removal filter (1 ms, 5 ms, 10 ms, 20 ms, 50 ms)	10.4 ms or less (ON to OFF), 11.2 ms or less (OFF to ON)
External Power Supply	Voltage	19.2 to 28.8VDC (ripple ratio: 5% or less)	
	Current	40 mA (at 24VDC, all points ON, not including external load current)	45 mA (at 24VDC, all points ON, not including external load current)
Points / Common		16 input points/common (spring clamp terminal block 2-wire type)	4 output points/common (spring clamp terminal block 2-wire type)
Common Current		-	Max. 2 A
Number of Occupied Stations		1 station	
Safety Refresh Response Processing Time		9.6 ms	
Module Power (*1)	Voltage	19.2 to 28.8VDC (ripple ratio: 5% or less)	
	Current	120 mA or less (24VDC, all points ON)	95 mA or less (24VDC, all points ON)
	Momentary Power Failure Period	10 ms or less	
Degree of Protection		IP2X	
Connection Type		Screw Terminal	
Weight (kg)		0.46	0.45
Applicable DIN Rail		TH35-7.5Fe, TH35-7.5Al (JIS C 2812 compliant)	
Dimensions (W x H x D) mm		163 x 98 x 85	197 x 65 x 74.5

Notes:

1. The power supply connected to the QS0J65BTB2-8D and QS0J65BTS2-4T must satisfy the following conditions:
   (1) SELV (Safety Extra Low Voltage): Reinforced insulation from hazardous potential part (48 V or more) required.
   (2) Compliance with the LVD (Low Voltage Directive).
   (3) Output voltage must be 19.2 to 28.8 V DC (ripple ratio: 5% or less).
2. Two input terminals are assigned for each input since dual wiring is supported. Do not insert two or more wires into one terminal.

F. Safety Relay Modules

Function	Description
Dual Input Function	Prevents damage of the safety functions due to a single failure by doubling inputs. Input N type: Dual input with positive common and negative common Input P type: Dual input with positive commons In the case of input N type, when a short circuit occurs between the dual inputs, a short circuit occurs between the power supply and grounding. Therefore, power goes off by the electric fuse.
Start-Up/Off Check Function	Checks that status of the safety relay module and external device are normal.
Start-Up Method Selection Function	Checks that status of the safety relay module and external device are normal.
Monitor Function	Allows to check operating status of the whole safety relay modules including extension safety relay modules by connecting to the programmable controller using programming tool.
Partial Shutdown Function With Extension Module	Allows to shut off outputs of a certain module by using safety inputs of extension module.



Safety Relay Module Specifications

Model Number		Q Series Safety Relay Module		CC-Link Safety Relay Module		Extension Safety Relay Module	
		QS90SR2SP-Q	QS90SR2SN-Q	QS90SR2SP-CC	QS90SR2SN-CC	QS90SR2SP-EX	QS90SR2SN-EX
Stocked Item		S	S	S	S	S	S
Applicable Safety Standard		EN954-1 Category 4, ISO13849-1 PL e					
Number of Safety Input Points		1 point (2 inputs)					
Number of Start-Up Input Points		1 point					
Number of Safety Output Points		1 point (3 outputs)					
Rated Load Current		Category 4: 3.6 A/point or less, Category 3: 5.0 A/point or less (250VAC/30VDC)					
Response Time	Time Until Output OFF	20 ms or less (safety input OFF to safety output OFF)					
	Time Until Output ON	50 ms or less (safety input ON to safety output ON)					
Module Power Supply		20.4 to 26.4VDC (ripple ratio: 5% or less)		20.4 to 26.4VDC (ripple ratio: 5% or less)		Supplied from Q Series safety relay module or CC-Link safety relay module.	
Safety Power Supply		20.4 to 26.4VDC (ripple ratio: 5% or less)		20.4 to 26.4VDC (ripple ratio: 5% or less)		Supplied from Q Series safety relay module or CC-Link safety relay module.	
Number of Extension Modules		Max. 3 extension safety relay modules		Max. 3 extension safety relay modules		N/A	
External Connections		Two-piece spring clamp terminal block					
Relay Life	Mechanical	5,000,000 times or more					
	Electrical	100,000 times or more					
Input Type		P type (dual input with positive commons)	N type (dual input with positive common and negative common)	P type (dual input with positive commons)	N type (dual input with positive common and negative common)	P type (dual input with positive commons)	N type (dual input with positive common and negative common)

Safety Relay Module Extension Cables

Model Number	QS90CBL-SE01	QS90CBL-SE15
Stocked Item	S	S
Cable Length (m)	0.1	1.5