Information 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 coprocessors, 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.

Serial Communication Modules

Model Number		QJ71C24N	QJ71C24N-R2	QJ71C24N-R4
Stocked Item		S	S	S
Certification		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 up to 230400 bps for two interfaces; Transmission speed of up to 115200 bps for each interface available when two interfaces 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		(see table below)		
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	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		

Transmission Control:

	RS-232	RS-422/485
DTR/DSR (ER/DR) Control	•	-
RS/CS Control	•	-
CD Signal Control	•	-
DC1/DC3 (Xon/Xoff) Control, DC2/DC4 Control	•	•

• DTR/DSR signal control and DC code control are selected by the user

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	
Error Correction	Class 4, class 10 compatible, V.42 compatible	V.110 (B-channel circuit exchange, D-channel packet switching)
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.

Intelligent Communication Modules

The modules offer a higher-level alternative to the QJ71C24 and QJ71C24-R2. The QD51 and 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.

Model Number	QD51	QD51-R24
Stocked Item	-	-
Certification	UL • cUL • CE	
Programming Language	AD51H-BASIC	
Internal Memory	Program memory: 64 kB/2 tasks (Capacity of task 1 + capacity of task 2 ≤ 64 kB); Common memory: 8 kB; Buffer memory: 6 kB; Expanded register: 1024 points (2 kB); 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	

Ethernet Enterprise Level Network Modules

Model Number			QJ71E71-100	
Stocked Item			S	
Certification			UL • cUL • CE	
Ethernet Transition Speed			100BASE-TX	10BASE-T
Transmission Specifications	Data Transmission Speed		100Mbps	10Mbps
	Communication Mode		Full-duplex/Half-duplex	Half-duplex
	Maximum Node-to-Node Distance		-	
	Maximum Segment Length		100 m (328.08 ft.) (*1)	
	Maximum Number of Modes/Connection		Cascade connection Maximum 2 stages	Cascade connection Maximum 4 stages
	Interval Between the Minimum Nodes		-	
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	
12VDC External Power Supply Capacity (Transceiver)			-	
Weight kg (lb)			0.11 (0.24)	
Base Unit Slots Occupied			1	

Note 1: Length between the Hub and node.

Ethernet Switch

Model Number	Description	Stocked Item
NZ2EHG-T8N	Industrial Ethernet switch, 100Mbps	S

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
Ethernet (*1) 10BASE-T 100BASE-TX — No. of Cascaded Stages	Maximum 4 stages	Maximum 2 stages
Ethernet (*1) 10BASE-T 100BASE-TX — Max. Segment Length (*2)	100m	
Compact Flash Card — Supply Power Voltage	3.3 V±5%	
Compact Flash Card — Supply Power Capacity	Maximum 150mA	
Compact Flash Card — Card Size	TYPE I card	
Compact Flash 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 (*3) — 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)	
Data Sampling (*3) — Data Sampling Interval (Point) — General Data Sampling	0.1 to 0.9 seconds; 1 to 32767 seconds	
Data Sampling (*3) — 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)	
Data Sampling (*3) — Amount of Sampled Data (*4, *5, *6) — General Data Sampling	Overall amount of data: maximum of 16384 (per setting: 256); Overall number of device points: maximum of 262144 (per setting: 4096)	
Data Sampling (*3) — 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 Sampling (*3) — Data Output Format (CSV File) (*8)	Bit, Decimal format, Exponential format, Hexadecimal format, String, Raw	
Data Sampling (*3) — Scaling (*9)	Basic arithmetic operations: calculations combining (×, ÷) and (+, -)	
Data Logging — Number of Settings	Maximum of 64 settings (*10)	
Data Logging — Logging Type	Continuous logging, Trigger logging	
Data Logging — File Format	CSV file (extension: CSV), Binary file (extension: BIN) (*11)	
Data Logging — 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)	
Data Logging — 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)	
Data Logging — Trigger Logging — Number of Logging Rows	Before trigger occurs: 0 to 32767 lines; After trigger occurs: 1 to 32767 lines	
Data Logging — 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	
Data Logging — Max. Number of Files Saved	65535	
Event Logging — Number of Settings	Maximum of 64 settings (*10)	
Event Logging — Number of Events	Maximum of 64 events per single event logging setting	
Event Logging — File Format	CSV file (extension: CSV); Binary file (extension: BIN)	
Event Logging — 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	
Event Logging — Period	Data condition, Date range, Time range, Day of week/week condition, AND or OR combination of the above: up to 8 conditions (*13)	
Event Logging — File Switching Timing	No. of rows (no. of records), File size specification, Data condition, Data change, Fixed cycle, Time of day, at module startup	
Event Logging — Number of Files Saved	65535	
Report — Number of Settings	Maximum of 64 settings (*10)	
Report — File Format	Excel format (extension: xls)	
Report — Output Data Type	Data inside data logging file (*14), Current value data, Creation time	
Report — Amount of Output Data	64 layouts per single report setting, 65535 cells in total	
Report — 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	
Report — Period	Data condition, Date range, Time range, Day of week/week condition, AND or OR combination of the above: up to 7 conditions (*12)	
Report — Layout File Size	Maximum of 10MB (total of all report settings)	
Report — Max. Number of Files Saved	65535	

Notes: See 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.

Compact Flash 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				

Standard MES Interface Module

As part of Mitsubishi's e-F@ctory technology, the QJ71MES96N 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.

Performance Specifications

Model Number	QJ71MES96N	
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	0.50A	
Weight (kg)	0.15	
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.

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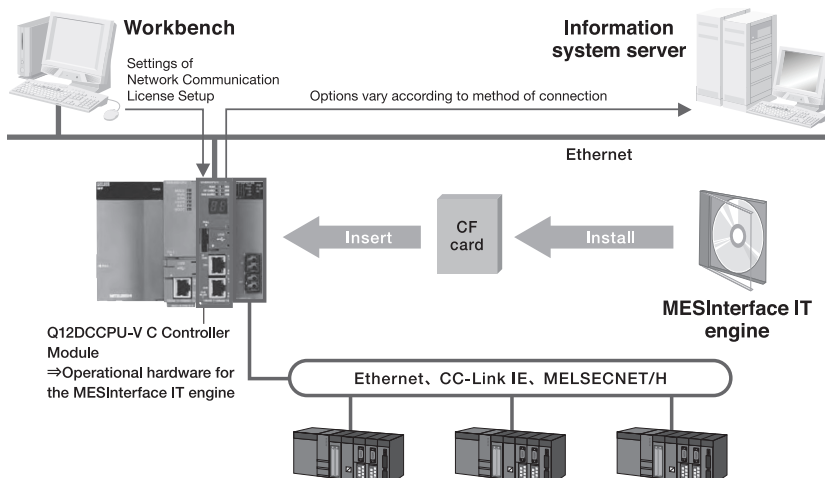
- Access to accurate and reliable production information
- Dramatically simplified system architecture
- Reduced integration time and effort
- Improved security and standardization
- Achieves lean and agile operation at the lowest cost of ownership

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.

Workbench
Settings of Network Communication License Setup

Information system server

Options vary according to method of connection

Ethernet

Insert

CF card

Install

MESInterface IT engine

Q12DCCPU-V C Controller Module
⇒Operational hardware for the MESInterface IT engine

Ethernet、CC-Link IE、MELSECNET/H

	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	MESITTRNSORCL	MES IT Oracle Transport + Local Database	S
	MESITTRNSSQL	MES IT SQL Transport + Local Database	S
	MESITTRNSDB2	MES IT DB2 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 Rockwell Driver (CompactLogix and ControlLogix)	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
	MESITDRVBCKHFF	MES IT Beckhoff Driver	S
	MESITDRVEMS	MES IT EMS Driver	S
	MESITDRVMBUS	MES IT MODBUS Driver	S
Spare Parts	QD81MEM-2GBC	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)