iQ-R Series Programmable Logic Controllers

iQ-R Series System Configuration

Power Supply
R61P AC input
R62P AC input
R64P AC input
R64RP AC input
R63P DC input
R63RP DC input

Main Base
R33B 3-slot
R35B 5-slot
R38B 8-slot
R310B-HT 10-slot
R312B 12-slot

Extension Base
R65B 5-slot
R68B 8-slot
R610B-HT 10-slot
R612B 12-slot

RQ Extension Base (Q Series Type)
RQ65B 5-slot
RQ68B 8-slot
RQ612B 12-slot

Extension Cable
RC06B 0.6m
RC12B 1.2m
RC30B 3m
RC50B 5m
RC100B 10m

Programmable Controller CPU
R_CPU
R_ENCPU

Motion CPU
R16MTCPU 16-axis
R32MTCPU 32-axis

Process & Redundant CPU
R_PCPU

SIL2 Process CPU
R08PSFCPU-SET
R16PSFCPU-SET
R32PSFCPU-SET
R120PSFCPU-SET

Safety CPU
R_SFCPU

SD Memory Card
L1MEM-2GBSD 2 GB
L1MEM-4GBSD 4 GB

Extended SRAM Cassette
NZ2MC-1MBS 1 MB
NZ2MC-2MBS 2 MB
NZ2MC-4MBS 4 MB
NZ2MC-8MBS 8 MB

AC Input
RX28 8-point
RX10 16-point

DC Input
RX40C7 16-point
RX41C4 32-point
RX42C4 64-point

Relay Output
RY18R2A 8-point
RY10R2 16-point

Triac Output
RY20S6 16-point

Transistor (Sink) Output
RY40NT5P 16-point
RY41NT2P 32-point
RY42NT2P 64-point

Transistor (Source) Output
RY40PT5P 16-point
RY41PT1P 32-point
RY42PT1P 64-point

I/O Combined Module
RH42C4NT2P

High Speed I/O
RX41C6HS 32-point
RX61C6HS 32-point
RY41NT2H 32-point
RY41PT2H 32-point

High Speed I/O Combined Module
RD40PD01

I/O with Diagnostics
RX40NC6B 16-point
RY40PT5B 16-point

Analog Input
R60AD4 4-channel
R60ADV8 8-channel
R60ADI8 8-channel
R60ADI8-HA 8-channel

Analog Output
R60DA4 4-channel
R60DAV8 8-channel
R60DAI8 8-channel

Isolated Analog Output
R60DA8-G 8-channel
R60DA16-G 16-channel

SIL2 Analog Control Output
RY40PT5B-AS 8-channel

High-Speed Analog Output
R60DAH4 4-channel

Simple Motion
RD77MS2 2-axis
RD77MS4 4-axis
RD77MS8 8-axis
RD77MS16 16-axis

Positioning
RD75P2 2-axis
RD75P4 4-axis
RD75D2 2-axis
RD75D4 4-axis

High-Speed Counter
RD62P2 2-channel
RD62P2E 2-channel
RD62D2 2-channel

Channel Isolated Pulse Input
RD60P8-G 8-channel

Ethernet
RJ71EN71

EtherNet/IP
RJ71EIP91

CC-Link IE Control Network
RJ71GP21-SX
RJ71GP21S-SX

CC-Link IE Field Network
RJ71GF11-T2

CC-Link
RJ61BT11

Serial Communication
RJ71C24
RJ71C24-R2
RJ71C24-R4

DeviceNet Module
RJ71DN91

PROFINET Module
RJ71PN92

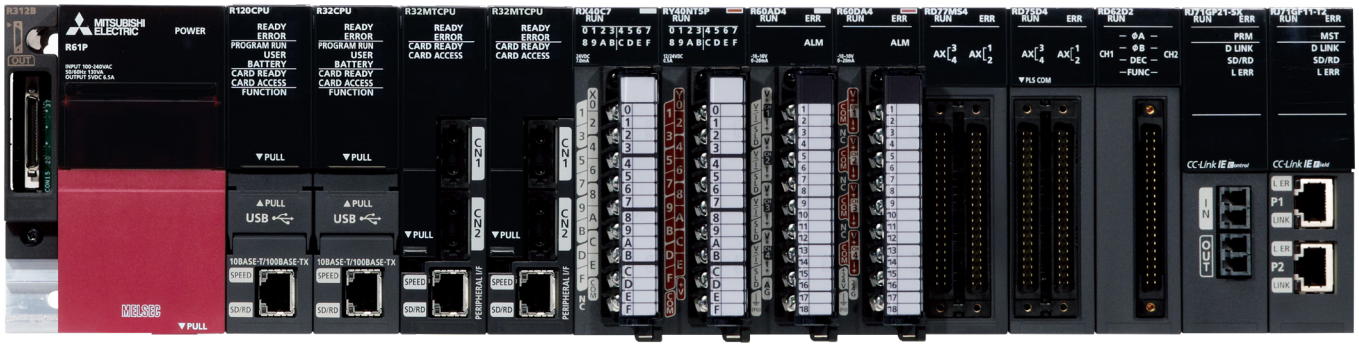
PROFIBUS-DP Module
RJ71PB91V

CANopen Module
RJ71CN91

OPC Server Module
RD81OPC96

MES Interface
RD81MES96

High-Speed Data Logger
RD81DL96



iQ-R CPU Modules

The iQ-R Series is the latest controller to join the iQ Platform. This fully integrated programmable automation controller is far more powerful than ever before and incredibly easy to program using the new GX Works3 programming software. It has the industry's fastest processing speed, advanced security features to keep assets safe, and a built-in database for recipe management. Besides integrating discrete, motion, process, and safety control onto a single platform, the iQ-R is also an excellent interface with other Mitsubishi Electric products, such as the GOT2000, A800 VFD, and MR-J4 servo amplifiers.

Model Number				R00CPU	R01CPU	R02CPU	R04CPU R04ENCPU	R08CPU R08ENCPU	R16CPU R16ENCPU	R32CPU R32ENCPU	R120CPU R120ENCPU
Stocked Item				S	S	S	S	S	S	S	S
Certification				UL • cUL • CE							
Operation Control Method				Stored program cyclic operation							
I/O Control Mode				Refresh mode (The direct access input/output is available by specifying the direct access input/output (DX, DY))							
Instruction Processing Time	LD X0			31.3ns		3.92ns	0.98ns				
	MOV D0 D1			62.7ns		7.84ns	1.96ns				
Instruction Processing Time (Structured Text)	IF Statement			31.3ns		3.92ns	1.96µs				
	CASE Statement (Two Branches)			31.3ns		3.92ns	1.96µs				
	FOR Statement			31.3ns		3.92ns	1.96µs				
Memory Capacity	Program Capacity			10K steps (40K bytes)	15K steps (60K bytes)	20K steps (80K bytes)	40K steps (160K bytes)	80K steps (320K bytes)	160K steps (640K bytes)	320K steps (1280K bytes)	1200K steps (4800K bytes)
	Program Memory			40K bytes	60K bytes	80K bytes	160K bytes	320K bytes	640K bytes	1280K bytes	4800K bytes
	SD Memory Card			-	Differs depending on the SD memory card used. (SD/SDHC memory card: 32Gb maximum)						
	Device/ Label Memory	Total		252K bytes			400K bytes	1188K bytes	1720K bytes	2316K bytes	3380K bytes
		Device Area (*1)		60K bytes			80K bytes				
		Label Area (*1)		60K bytes			60K bytes	80K bytes	100K bytes	180K bytes	220K bytes
		Latch Label Area (*1)		4K bytes						8K bytes	
		File Storage Area (*1)		128K bytes			256K bytes	1024K bytes	1536K bytes	2048K bytes	3072K bytes
	Signal Flow Memory	Area for Programs		1.25K bytes	1.87K bytes	2.5K bytes	5K bytes	10K bytes	20K bytes	40K bytes	150K bytes
		Area for Function Blocks		256K bytes			256K bytes(*2)				
	Data Memory			1.5M bytes			2M bytes	5M bytes	10M bytes	20M bytes	40M bytes
	Function Memory			-			5120K bytes				
	CPU Buffer Memory			1072K bytes (536K words) (including the fixed scan communication area (24K words))							
	Refresh Memory (*2)			2048K bytes (*3)							
Number of Storable Files	Program Memory (P: Number of Program Files, FB: Number of FB Files)			P: 32, FB: 16 (*7)		P: 64, FB: 32 (*7)	P: 124, FB: 64 (*7)	P: 252, FB: 128 (*7)			
	Device/Label Memory (File Storage Area) (*3)			128 (*4)			324 (with or without an extended SRAM cassette) (*4)				
	Data Memory (*4)			256 (*5)				512 (*5)			
	Function Memory			-			512 (*6)				
	SD Memory Card			-	NZ1MEM-2GBSD: 256 (*5) • NZ1MEM-4GBSD, NZ1MEM-8GBSD, NZ1MEM-16GBSD: 32767 (*5)						
USB Port				USB2.0 High Speed (miniB) x 1							
Ethernet Port				Refer to the MELSEC iQ-R Ethernet/CC-Link IE User's Manual (Startup)							
Number of Occupied I/O Points				-			RnENCPU (network part): 32				
Clock Function				Year, month, date, hour, minute, second, and day of the week (automatic leap year adjustment) -1.00 to +1.00s/d at 0 to 55°C							
Backup Power	Backup Method			Capacitor							
	Backup Power Time (*8)			10 days			Three minutes				
	Data Retained			Clock data			Device/label memory, clock data				
Internal Current Consumption (5 VDC)				0.67A			RnCPU: 0.67A; RnENCPU: 1.49A				
Allowable momentary power failure time				The time differs depending on the power supply module used.							
External Dimensions (H x W x D) (mm)				106 x 27.8 x 110 (Base unit mounting side: 98 mm)			R_CPU: 106 x 27.8 x 110 (Base unit mounting side: 98 mm); R_ENCPU: 106 x 56 x 110 (Base unit mounting side: 98 mm)				
Weight (kg)				0.20			R_CPU: 0.20; R_ENCPU: 0.40				

Notes:

1. The capacity of device area, label area, latch label area, and file storage area can be changed in parameter. The capacity of the device/label memory can be increased by inserting an extended SRAM cassette. (MELSEC iQ-R CPU Module User's Manual) (Application))
2. For the programmable controller CPU with the firmware version "27" or earlier, the memory capacity is 20K bytes.
3. This is the total capacity of the device area and module label area.
4. System files are included.
5. The number indicates the number of files and folders (including system files and system folders) can be created in the root directory on the condition that the number of characters in the file or folder name is 13 or less. In a subdirectory, up to 32767 folders can be created. Note that the number of storable files and folders will decrease if many folders with a long name, more than 13 characters (including an extension), are created.
6. The number indicates the number of files and folders (including system files and system folders) can be created in the root directory on the condition that the number of characters in the file or folder name is 13 or less. In a subdirectory, up to 2482 folders can be created.
7. One FB file can store 64 function blocks.
8. These backup power times apply under the ambient temperature of 25°C.

CC-Link IE Field Specification

Model Number				R_ENCPU
Maximum Number of Link Points per Network (*1)			RX/RY	16K points (16384, 2k bytes) each
			RWr/RWw	8K points (8192 points, 16k bytes) each
Maximum Number of Link Points Per Station	Master Station		RX/RY	16K points (16384, 2k bytes) each
			RWr/RWw	8K points (8192 points, 16k bytes) each
	When the Submaster Function is Used	Master Operating Station	RX/RY	16K points each (for RY, own station send range is 2K Points)
			RWr/RWw	8K Points each (for RWw, own station send range is 1024 points); 8K points each when communication mode is "High-Speed" (for RWw, own station send range is 256 points)
		Submaster Operating Station (*1)	RX/RY	2K Points each (assigned to station #0 or submaster station)
			RWr/RWw	1024 points each (assigned station #0 or submaster station); 256 points each when communication mode is "High-Speed"
	Local Station		RX/RY	2K points (2048 points, 256 bytes) each
			RWr/RWw	1K points (1024 points, 2kb) each; 256 points (512 bytes) each when communication mode is "High Speed"
Transient Transmission Capacity				1920 bytes maximum
Communication Speed				1Gbps
Network Topology				Line topology, star topology (coexistence of line topology and star topology is also possible), and ring topology
Communication Cable				Ethernet cable which satisfies 1000BASE-T standard: Category 5e or higher, straight cable (double shielded, STP)
Maximum Station-to-Station Distance				100m (conforms to ANSI/TIA/EIA-568-B (Category 5e))
Overall Cable Distance				Line topology: 12,000m (when 121 stations are connected); Star topology: Depends on the system configuration; Ring topology: 12, 100m (when 121 stations are connected)
Number of Cascade Connections				20 levels maximum
Maximum Number of Connectible Stations				121 stations (master station: 1, slave station: 120)
Maximum Number of Networks				239
Communication Method				Token passing

Note 1: The maximum number of points that a master station can assign to one station. A submaster station and a local station can receive the data from other stations in addition to this number of points.

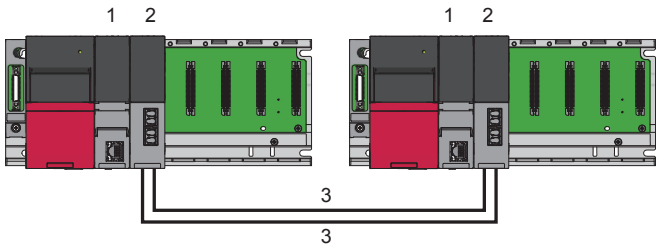
Process CPU Specifications

Model Number			R08PCPU	R16PCPU	R32PCPU	R120PCPU
Stocked Item			S	S	S	-
Certification			UL • cUL • CE			
Operation Control Method			Repetitive operation of stored program			
I/O Control Mode			Refresh mode: The direct access input/output is available by specifying the direct access input/output (DX, DY)			
Instruction Processing Time	LD X0		0.98ns			
	MOV D0 D1		1.96ns			
Instruction Processing Time (Structured Text)	IF Statement		1.96µs			
	CASE Statement (Two Branches)		1.96µs			
	FOR Statement		1.96µs			
Memory Capacity	Program Capacity		80K steps (320K bytes)	160K steps (640K bytes)	320K steps (1280K bytes)	1200K steps (4800K bytes)
	Program Memory		320K bytes	640K bytes	1280K bytes	4800K bytes
	SD Memory Card		Differs depending on the SD memory card used. (SD/SDHC memory card: 32G bytes maximum)			
	Device/Label Memory	Total	1188K bytes	1720K bytes	2316K bytes	3380K bytes
		Device Area (*1)	80K bytes			
		Label Area (*1)	80K bytes	100K bytes	180K bytes	220K bytes
		Latch Label Area (*1)	4K bytes		8K bytes	
		File Storage Area (*1)	1024K bytes	1536K bytes	2048K bytes	3072K bytes
	Data Memory		5M bytes	10M bytes	20M bytes	40M bytes
	CPU Buffer Memory		1072K bytes (536K words) (including the fixed scan communication area (24K words))			
	Refresh Memory		2048K bytes (This is the total capacity of the device area and module label area)			
Number of Storable Files	Program Memory (P: Number of Program Files, FB: Number of FB Files)		380 (P: 252, FB: 128 (One FB file can store 64 function blocks))			
	Device/Label Memory (File Storage Area) (*2)		324 (with or without an extended SRAM cassette) (System files are included)			
	Data Memory (*3)		512			
	SD Memory Card		NZ1MEM-2GBSD: 256; NZ1MEM-4GBSD and larger: 32767			
Number of Storable Folders	Data Memory (*3)		512			
	SD Memory Card		NZ1MEM-2GBSD: 256; NZ1MEM-4GBSD and larger: 32767			
USB Port			USB2.0 High Speed (mini B) x 1			
Ethernet Port			10BASE-T/100BASE-TX x 1. See MELSEC iQ-R Ethernet/CC-Link IE User's Manual (Startup)			
Clock Function			Year, month, date, hour, minute, second, and day of the week (Leap years are automatically identified) -1.00 to +1.00s/d at 0 to 55°			
Internal Current Consumption (5 VDC)			0.67A			
External Dimensions (H x W x D) (mm)			106 x 27.8 x 110 (Base unit mounting side: 98 mm)			
Weight (kg)			0.20			

Notes:
1. The capacity of device area, label area, latch label area, and file storage area can be changed in parameter. The capacity of the device/label memory can be increased by inserting an extended SRAM cassette.
2. This is the total capacity of the device area and module label area.
3. The number indicates the number of files and folders (including system files and system folders) can be created in the root directory on the condition that the number of characters in the file or folder name is 13 or less. In a subdirectory, up to 32767 folders can be created. Note that the number of storable files and folders will decrease if many folders with a long name, more than 13 characters (including an extension), are created.

Redundant CPU

A Process CPU is needed along with the R6RFM Redundant Function Module, to configure a redundant system. See the Process CPUs listed in the previous section. A redundant system uses standard iQ-R main base units.



1. Process CPU
2. Redundant function module
3. Tracking cable

Redundant Function Module

The R6RFM Redundant Function Module is not included with the Process CPU and must be purchased separately. It must be mounted on the slot directly to the right of the CPU.

Model Number		R6RFM
Stocked Item		S
Certification		UL • cUL • CE
Tracking Cable	Cable Specifications	An optical fiber cable compliant with the following standards (multimode optical fiber (GI)) • IEEE802.3 (1000BASE-SX) • IEC 60793-2-10 Types A1a.1
	Maximum Cable Length	550m
Optical Fiber Specifications		Standard: IEEE802.3, IEC 60793-2-10 (Types A1a.1); Outside diameter of the core/clad: 50µm, 62.5µm/125µm; Transmission loss: 3.0dB/km or lower [λ=850nm]; Transmission band: 500MHz km or more [λ=850nm]
Connector Specifications		Duplex LC connector Standard: IEC 61754-20 (Type LC connector); Connection loss: 0.3dB or lower; Polished surface: PC (Physical Contact) polishing
Laser Class (IEC60825-1)		Class 1 laser product
Number of Occupied I/O Points		32 points (*1)
Internal Current Consumption (5VDC)		0.88A
Dimensions (H x W x D) mm		106 x 27.8 x 110 (Height base unit mounting side: 98mm)
Weight (kg)		018

Note 1: All I/O signals are use prohibited.

Redundant Tracking Cable

An optical fiber cable compliant with the following standards may be used:

- IEEE802.3 (1000BASE-SX)
- IEC 60793-2-10 Types A1a.1

CC-Link IE Control cables such as this may also be used:

QG-1M-B-LL	1 meter CC-Link IE Control fiber optic cable
QG-2M-B-LL	2 meter CC-Link IE Control fiber optic cable
QG-3M-B-LL	3 meter CC-Link IE Control fiber optic cable
QG-5M-B-LL	5 meter CC-Link IE Control fiber optic cable

SIL2 Process CPU

Model Number	R08PSFCPU-SET (*1)	R16PSFCPU-SET (*1)	R32PSFCPU-SET (*1)	R120PSFCPU-SET (*1)
Stocked Item	-	-	-	-
Control Method	Stored program cyclic operation			
I/O Control Mode	Refresh mode (Direct access I/O is available by specifying direct access I/O (DX, DY))			
Programming Language	Ladder diagram (LD), structured text (ST) (*2), function block diagram (FBD) (*2), sequential function chart (SFC) (*2, *3)			
Extended Programming Language	Function block (FB), label programming (system/local/global)			
Program Execution Type	Initial (*2), scan (*2) fixed scan, interrupt (*2), standby (*2)			
Number of I/O Points [X/Y](Point)	4096	4096	4096	4096
Constant Scan (ms) (Function for Keeping Regular Scan Time)	0.2…2000 (Setting available in 0.1ms increments)			
Program Capacity (step)	80K (*5)	160K (*5)	320K (*5)	1200K (*5)
Program Memory (byte)	320K	640K	1280K	4800K
Device/Label Memory (ECC Type) (*4)	1178K	1710K	2306K	3370K
Data Memory (byte)	5M	10M	20M	40M
Memory Interface	SD Memory Card, Extended SRAM Cassette			
Safety Standard IEC 61508 SIL 2	Yes	Yes	Yes	Yes
Functions (*6)	Multiple Interrupt; Standard PID Control; Process Control; Security Function; SLMP Communication; Online Module Change Not supported: Data Logging; Inter-modular Synchronization (*7)			

Notes:

1. Product package includes a SIL2 process CPU (R_PSFCPU) and SIL2 function module (R6PSFM).
2. Only for executing generic control programs.
3. SFC programming language is not supported when the process CPU is used in redundant mode (future support).
4. An extended SRAM cassette expands the device/label memory area.
5. Program capacity of 40K steps is allocated for safety program.
6. Memory dump and real-time monitor are not supported.
7. Inter-modular synchronization is not supported when used in redundant mode.