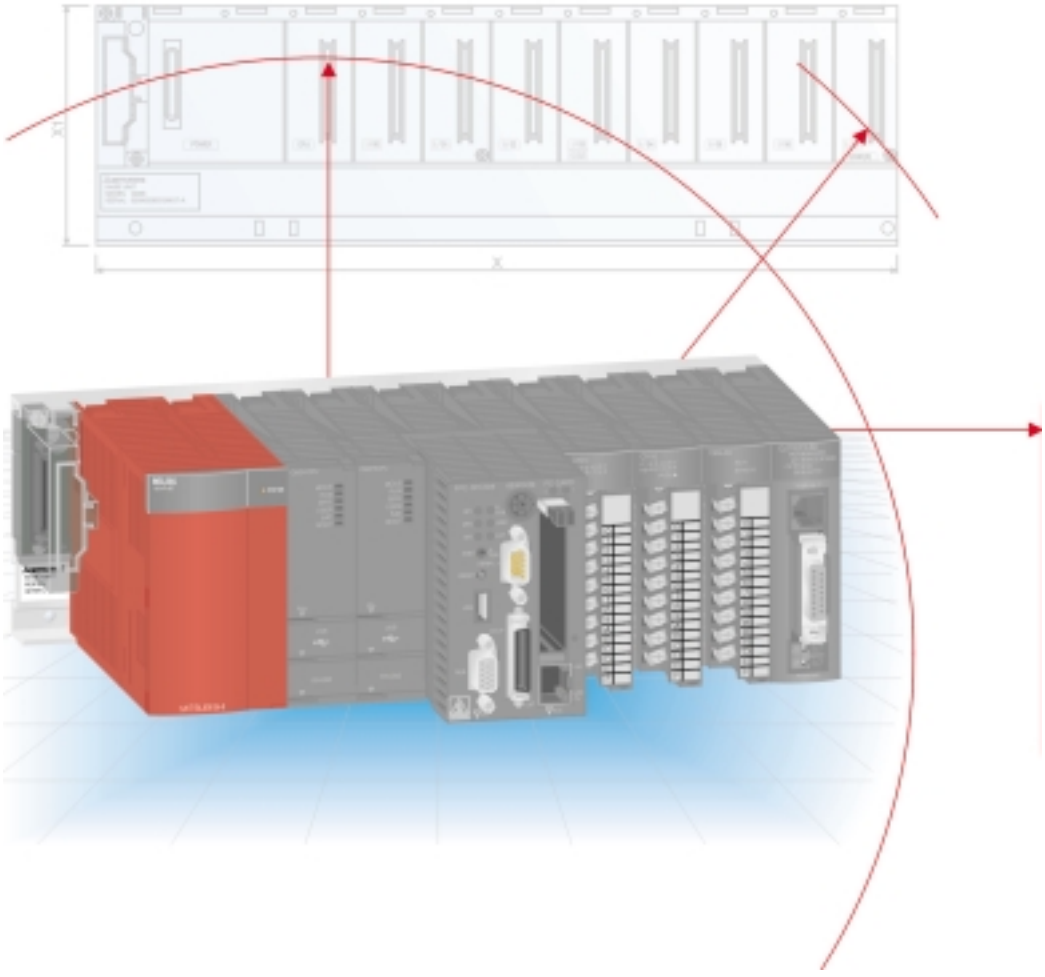
MITSUBISHI ELECTRIC

Programmable
Logic
Controllers

MELSEC
System Q

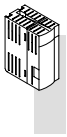


Technical Catalogue

2004

The MELSEC System Q

New Items 2004



CPU Modules

Two new high-performance process modules have been added to the existing range of PLC CPU modules, the Q12(P)HCPU and Q25(P)HCPU. The new versions of the Q00CPU and Q01CPU CPU modules now also have limited multiprocessor capabilities.

I/O Modules

Two new input modules have been added to the existing range of digital I/O modules, the QX82 and QX82-S1, each with 64 inputs rated at 24 V.

Special Function Modules

The new analog module Q64RD-G with 4 galvanically isolated input channels enables a temperature measurement with Ni100 resistors. The QJ71C24N and QJ71C24N-R2 RS-232 port modules replace their predecessors in the interface module family and provide higher data transfer rates. A new RS-422/485 module, the QJ71C24N-R4, has also been added to the product range.

Software

Version 8.0 of the GX-Developer programming software package has now been released. New functions have been added to the IEC-1131 programming software package GX IEC Developer, which is now available in version 6.0. With MX4 SCADA a new process visualisation system is available, that can handle everything from simple installations to complex production control systems.

Further Publications within the PLC Range

Technical Catalogues

FX1S, FX1N, FX2N, FX2NC Series Technical Catalogue

Product catalogue for programmable logic controllers and accessories for the MELSEC FX family (art. no. 68544)

AnS/QnAS and AnU, QnA(R) Series Technical Catalogues

Product catalogues for programmable logic controllers and accessories for the MELSEC AnS/QnAS and AnU and QnA(R) series

HMI Technical Catalogue

Product catalogue for operator terminals, visualisation software and accessories (art. no. 68542)

Networks Technical Catalogue

Product catalogue for Master and Slave modules as well as accessories for the use of programmable logic controllers in open and MELSEC networks (art. no. 136730)

Additional services

You will find current information on updates, alterations, new items, and technical support on MITSUBISHI ELECTRIC's web pages (www.mitsubishi-automation.com). The products section of the MITSUBISHI home site includes various documentations of the whole product range by MITSUBISHI ELECTRIC as well as the current version of this catalogue on hand. All manuals and catalogues can be downloaded. The content is updated daily and to date is provided in German and English.

About this product catalogue

Due to the constantly growing product range, technical alteration, and new or changed characteristical features, this catalogue is updated frequently.

Texts, figures and diagrams shown in this product catalogue are intended exclusively for explanation and assistance in planning and ordering the programmable logic controllers of the MELSEC System Q and the associated accessories. Only the manuals supplied with the units are relevant for installation, commissioning and handling of the units and the accessories. The information given in these documentations must be read before installation and commissioning of the units or software.

Should questions arise with regard to the planning of modules described in this product catalogue, do not hesitate to contact the german branch of the MITSUBISHI ELECTRIC EUROPE B.V. in Ratingen or one of its distributors (see cover page).

MELSEC System Q

PROGRAMMING SYSTEMS

APPENDIX

NETWORK MODULES

- Please refer to the Networks Technical Catalogue for the MELSEC System Q network modules.

BASICS

The MELSEC System Q

Description

With the MELSEC System Q, MITSUBISHI ELECTRIC presents its most powerfull and compact modular PLC, with multiprocessor technology for present and future challenges.

The small size, the communications capability and the high-performance multiprocessing are three important characteristics of the MELSEC System Q. Its compactness ensures that it occupies less space in the switchgear cabinet and its diverse communication facilities guarantee flexibility and openness. Depending on the selected CPU type up to 4096 local and up to 8192 remote I/O points can be addressed. This controller is particularly suitable for performing medium- to high-performance automation tasks.

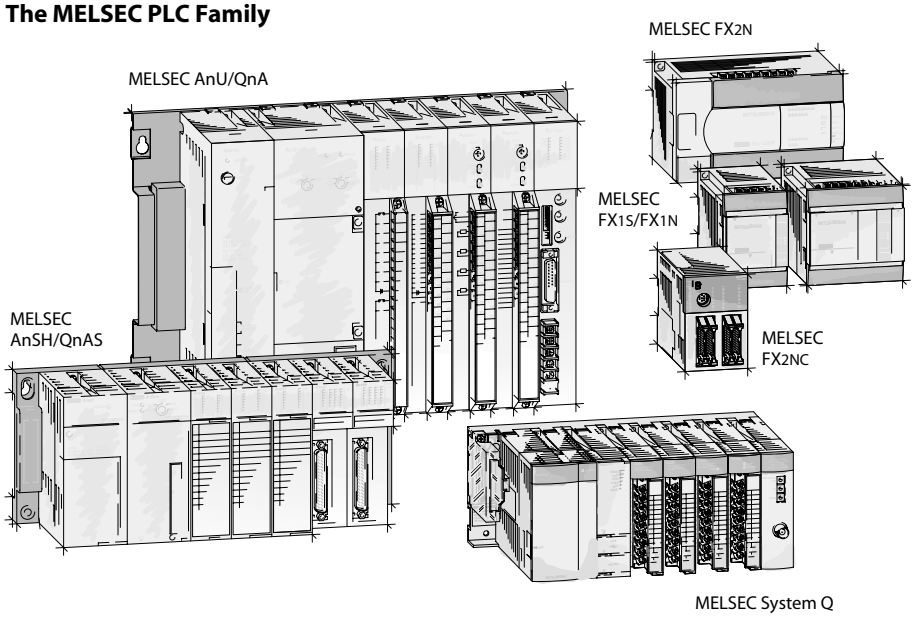
The individual systems can be installed in different MELSEC and open networks (e.g. MELSECNET, Ethernet or Profibus/DP), enabling them to communicate with one another. The number of I/Os can thus be increased several times.

Thanks to the unique combination possibilities of PLC, PC, and motion CPUs a platform is available that meets every automation task.

Special features

- up to 4096 local I/Os
- up to 8192 remote I/Os
- interchangeable intelligence
- multiprocessor technology with 12 different CPU types from 3 familys (PLC, PC and motion)
- wide range of communications facilities
- easy installation
- one system platform for all configurations
- innovative technology for future applications

The MELSEC PLC Family



Expandability and performance

As with other Mitsubishi controllers the power of the MELSEC System Q grows with your application – you simply replace or add a CPU. When using the multi processor type CPUs the control and communication tasks are shared by up to four CPUs. Every system can provide a maximum capacity of 4,096 local I/Os or 8,192 remote I/Os.

The integrated memory of up to 252 k program steps (which conforms to 1 MB RAM) can easily be expanded by up to 32 MB at any time just by slotting in an extension card (not for Q00(J) and Q01).

Flash ROM cards are also available for permanent storage of your controller programs for the Q02 and H type CPUs. An integrated buffer battery protects the data in the CPU's internal RAM against power failures.

The MELSEC System Q offers state-of-the-art performance by 1 single processor PLC CPUs, 2 process CPUs, 7 multi processor PLC CPUs as well as 2 diverse motion CPUs and 1 PC CPUs.

PLC CPUs (multi processor type)

- **Q00CPU** with 8 k steps program memory and a program cycle period of 0.16 µs/logical instruction
- **Q01CPU** with 14 k steps program memory and a program cycle period of 0.1 µs/logical instruction
- **Q02CPU** with 28 k steps program memory and a program cycle period of 0.079 µs/logical instruction
- **Q02HCPU** with 28 k steps program memory and a program cycle period of 0.034 µs/logical instruction
- **Q06HCPU** with 60 k steps program memory, program cycle period of 0.034 µs/logical instruction
- **Q12HCPU** with 124 k steps program memory and a program cycle period of 0.034 µs/logical instruction
- **Q25HCPU** with 252 k steps program memory and a program cycle period of 0.034 µs/logical instruction

Process CPUs (multi processor type)

- **Q12PHCPU** with 124 k steps program memory and integrated process function
- **Q25PHCPU** with 252 k steps program memory and integrated process function

PLC CPUs (single processor basic type)

- **Q00JCPU** as entry-level model. Here the CPU (8 k/0.2 µs), base unit and mains adaptor form a compact unit.

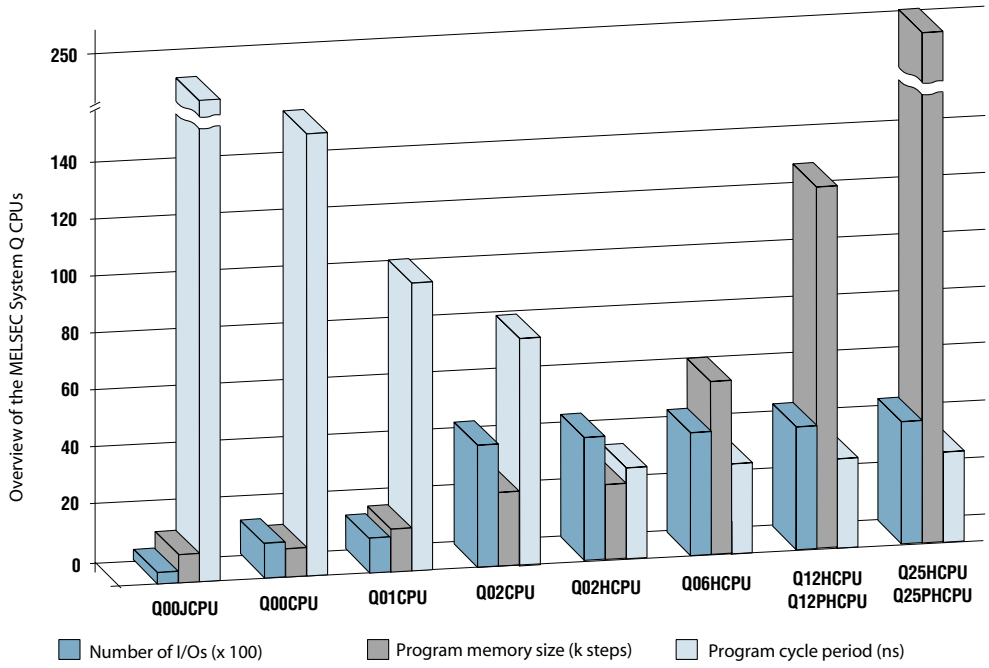
Motion CPUs

- **Q172CPUN** for positioning applications with up to 8 axis (per CPU)
- **Q173CPUN** for positioning applications with up to 32 axis (per CPU)

PC CPUs

- **PPC-CPU686(MS)-128** personal computer with Celereon processor, 128 MB RAM and graphics adapter

Selection Criteria



The performance spectrum of the 8 different PLC CPUs offers the right solution for all applications.

Combined with the 4 other CPUs possible applications result for very complex processes as well (see also the following page).

Combinations possibilities

Certain combinations are possible for the selection and use of the CPUs. The combination possibilities can be found in the opposite table and in the graphic at the bottom.

Some of the CPUs can be used as a master or as a slave CPU, however the master CPU must always be plugged as the first CPU next to the mains adaptor to the far left.

Combined with other CPUs the PC CPU must be positioned to the far right slot.

Depending on the CPUs used the power supply capacity must be accounted for accordingly (see also page 13).

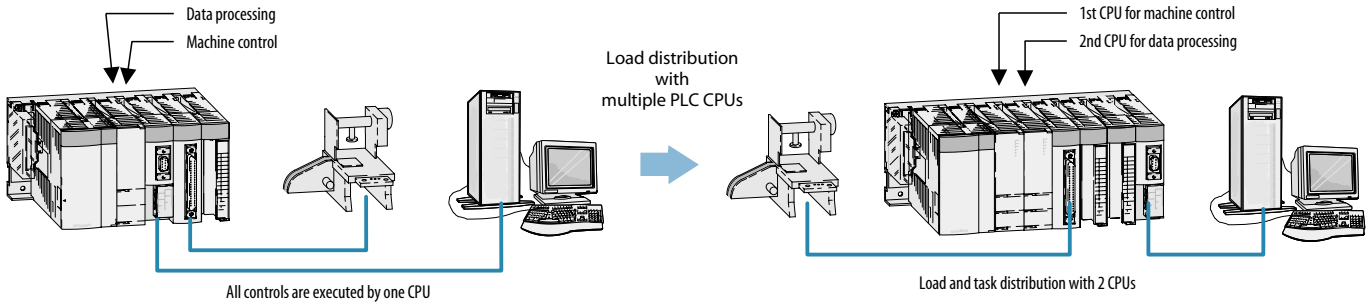
	Single PLC CPUs	Multi processor PLC CPUs	Motion CPUs	PC CPUs
CPU types	Q00JCPU	Q00CPU, Q01CPU, Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q12PHCPU, Q25PHCPU	Q172CPU Q173CPU	PPC-CPU686(MS)-128
Combinations possibilities	Stand-alone	Up to 4 CPUs in combination	In combination with a PLC master CPU	Stand-alone as master. In combination with a PLC Master CPU as slave
Max. number of usable CPUs per system	1 only	Max. 4	Max. 3	Max. 1
Application (hierarchy)	—	Master/slave	Slave	Master/slave

*Q00 and Q01CPU in combination with Motion CPU and PC CPU only!

Task Management with Multiple PLC CPUs

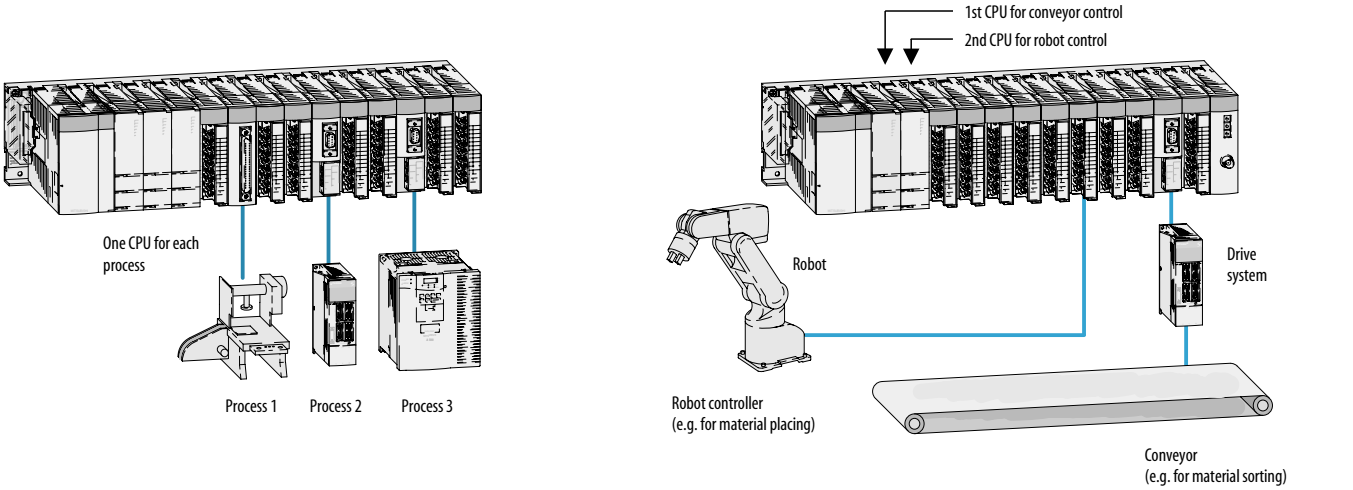
Multiple MELSEC System Q series PLC CPUs can be used together to allow a single system to execise controls that are different in tact time, e.g. sequence control and data processing.

Thus sequence control and data processing can be distributed to different CPUs.



If load in excess of a CPU's processing capability is applied to a large scale system due to a large program size, using multiple CPUs to distribute the load improves the overall performance of the system.

When one process requires fast processing and the other does not, they can be handled respectively by two CPUs, providing stable and rapid control which is unaffected by the other process.

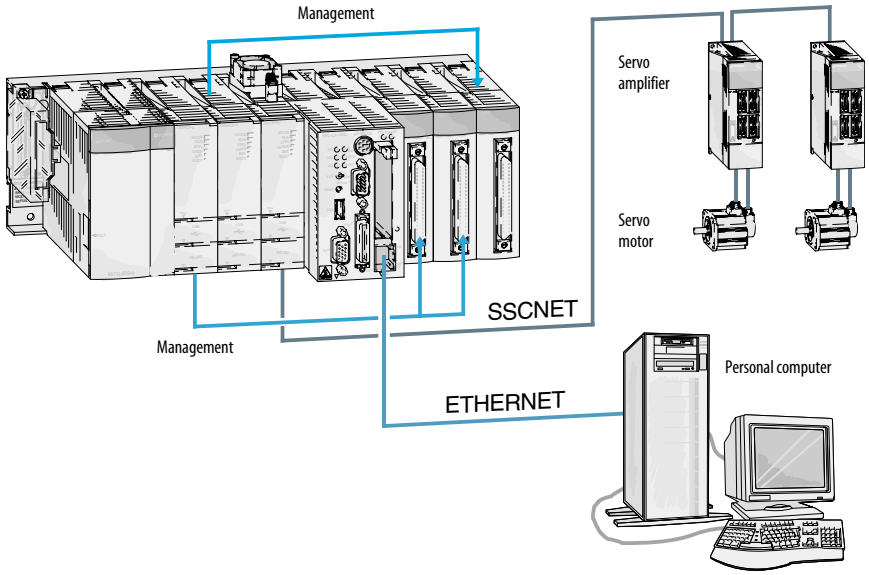


Integration of Motion CPU and Personal Computer CPU

The System Q has the multiple CPU system function which also permits PLC CPUs and Motion CPUs to be loaded together on one base unit. While data exchange is optimized via the back bus of the base unit, space requirements and system costs are significantly reduced at the same time.

A Motion CPU can use the SSCNET that rapidly controls up to 96 axes in a single system and saves wiring. The personal computer CPU (Q-PC) enables the access to I/O modules and intelligent function modules and the communication of all CPUs with each other.

The system can be controlled via the PC CPU during stand-alone operation in a high-level language such as C++,VB or with a soft PLC (SX Controller).



Equipment Features

Owing to the modular concept, the MELSEC system Q has a broad range of use with many possible applications.

The following modules are available for assembling the system:

To maximize the operational safety, all modules are isolated from the environment by means of optocouplers.

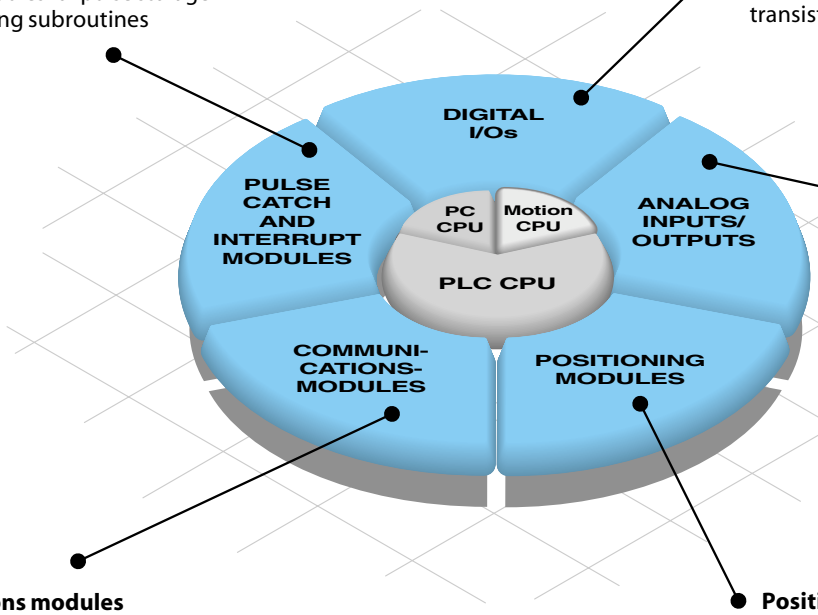
All I/O modules with screw contacts have their own removable terminal blocks which ensures easy handling during installation. The terminal block can be alternatively exchanged for a spring-loaded terminal block (optional).

Use of digital and special function modules

The use of digital and analog modules and most special function modules is dependent only on the maximum addressable number of addresses and thus on the CPU used in each case.

Pulse catch and interrupt modules
Digital input modules for pulse storage and for processing subroutines

Digital input/output modules
for various signal levels with transistor, relay or triac switches



Analog input/output modules
for current/voltage signals and for temperature value acquisition as well as temperature controlling with facility for direct connection of Pt100 resistance thermometers or thermocouples

Communications modules
Interface modules with RS232/RS422/RS485 interface for connection of peripherals or for PLC-PLC coupling.

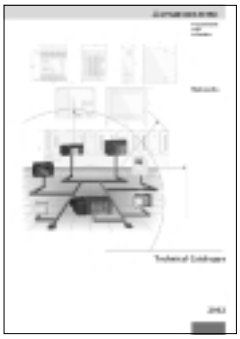
Network modules for Ethernet, Profibus, DeviceNet, AS-I and for setting up MITSUBISHI networks. Master modules for use of local analog or digital I/O modules.

Positioning modules
High-speed counter modules with possibility for connection of incremental shaft encoder or multiaxial positioning modules for servo and step drives with up to 8 axis.

Network modules

You can find all MELSEC System Q network modules and appropriate accessories of the MELSEC System Q in the Networks Technical Catalogue (art. no. 136730).

You can also find information about other Mitsubishi Electric network products here.



Configuration

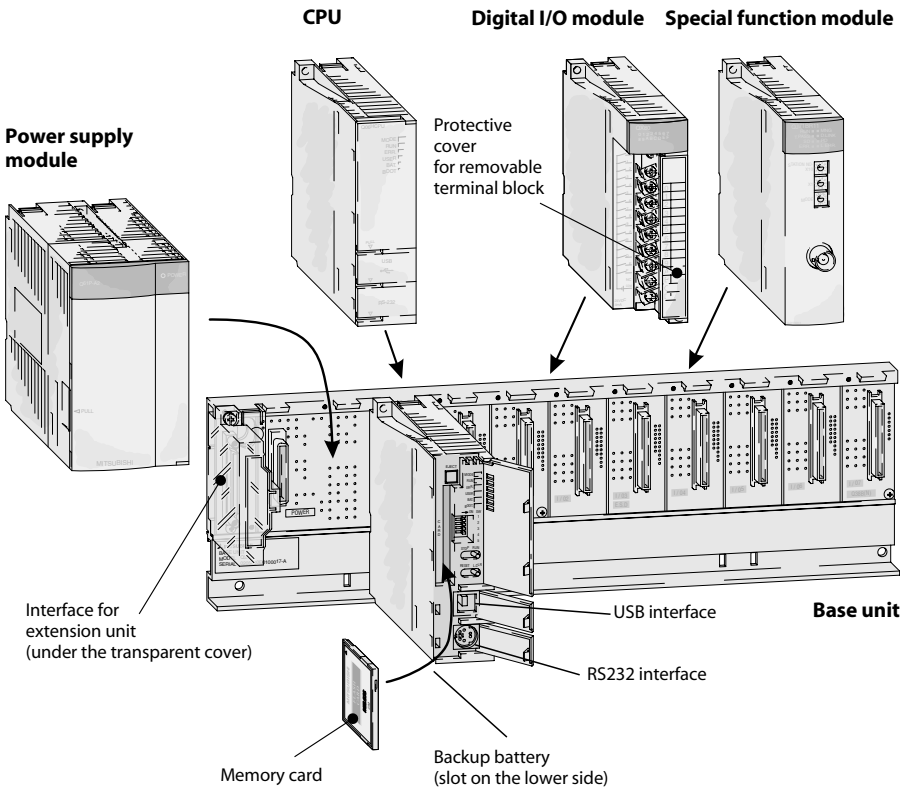
System structure

The CPU and modules are held in a base unit which has an internal bus connection for communication between the individual modules and the CPUs. The power supply module which supplies the voltage for the entire system is also installed on this base unit.

The base units are available in 4 different versions with 3 to 12 module slots. Each base unit can be supplemented by means of an extension unit providing additional slots.

If you wish to keep open the option of subsequent extension of your PLC or if you have free slots on your base unit, you can insert dummy modules here. They serve to protect the free slots from soiling or from mechanical effects but can also be used for reserving I/O points.

For cabling larger systems and machines - e.g. in a modular design - the use of remote I/O modules offers additional communications facilities.

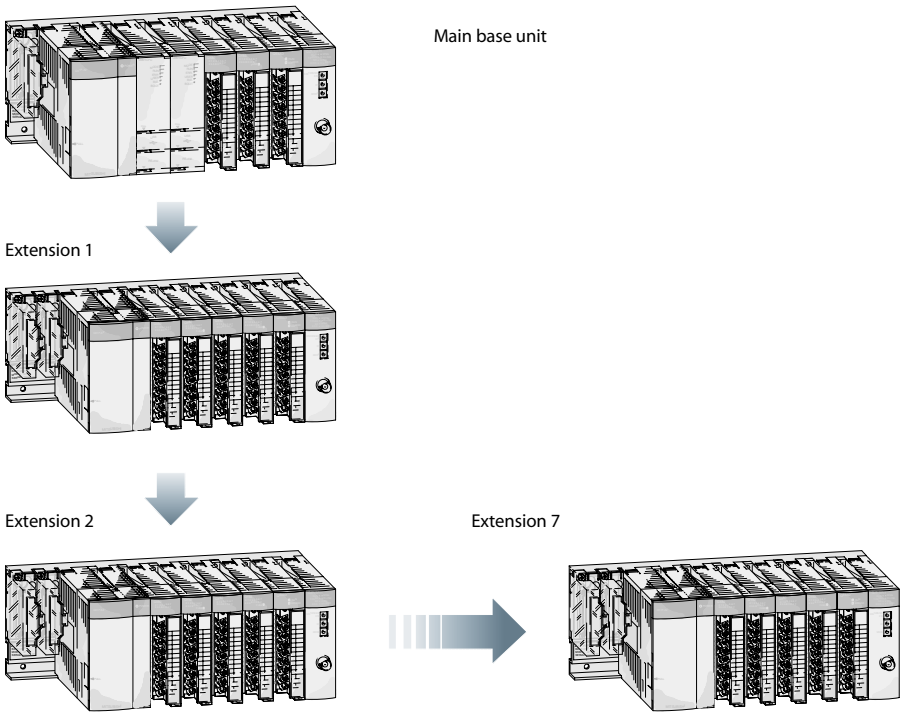


Extension

The base unit and extension units are simply connected to one another by extension cables. These connecting cables also supply the extension units with the operating voltage of 5 V DC.

Up to seven extension units with up to 64 modules can be connected to base units or extension base units. The extension may be in the horizontal or vertical direction and allows a maximum distance of the extensions cables of 13.2 m.

When choosing the power supply module, the total power consumption of the I/O modules, of the special function modules and of the peripherals must be taken into account. If necessary, an extension unit with a further power supply module should be used.

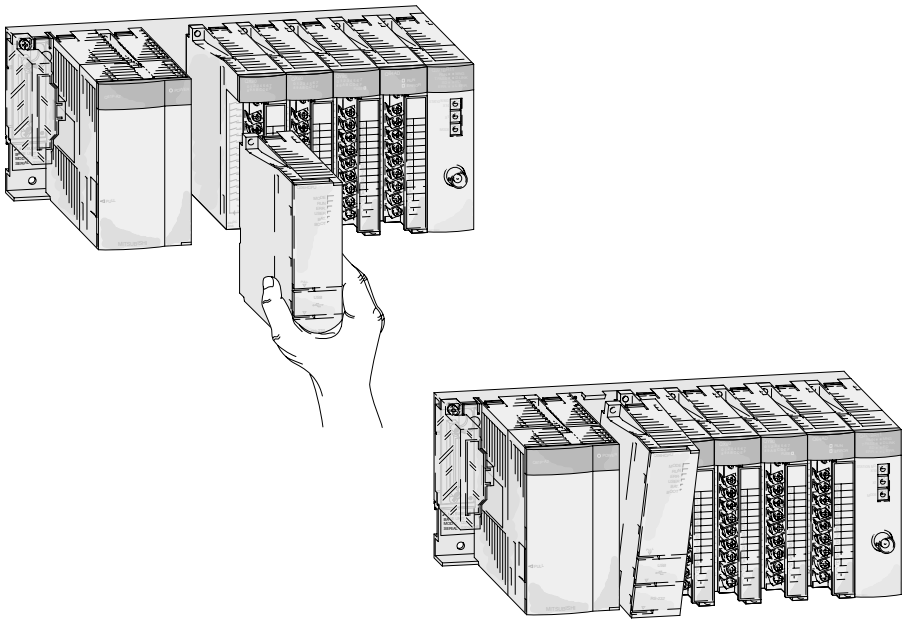


Handling

Mounting the modules

The modules are easily mounted on the base unit with the aid of a guide lug and an optional fixing screw. Installation can thus be carried out quickly and without problems.

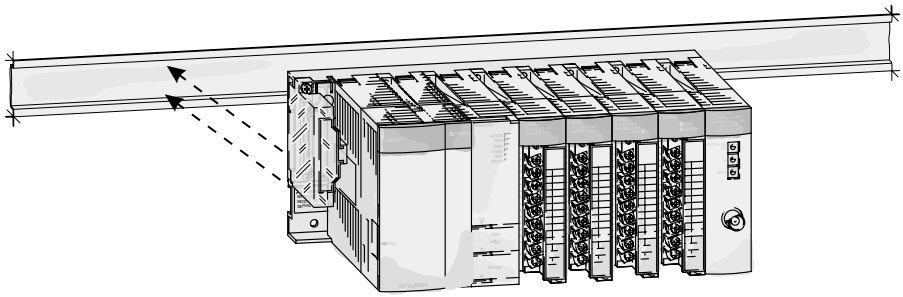
If it becomes necessary to change an I/O module, the screw terminal block can be removed beforehand. Thus, it is not necessary to disconnect the entire cabling, but only 2 screws.



Mounting the base unit

The base unit can be mounted by conventional screw attachments or with a special adapter on a DIN rail.

The individual base units can be mounted either side by side or up to 10 m apart.



General specifications

General Specifications	Data
Ambient operating temperature	0 – +55 °C
Storage temperature	-25 – +75 °C
Ambient relative humidity	max. 95 % (non-condensing)
Protection	IP 20
Noise durability	1500 Vpp with noise generator; 1 µs at 25 – 60 Hz
Insulation withstand voltage	AC 1500 V, 1 min.
Shock resistance	10 G (3 times each in 3 directions) / EN 61131-2
Vibration resistance	2 G: resistant to vibrations from 10 – 55 Hz for 2 hours along all 3 axes; 0.5 G for DIN rail mounting / EN 61131-2
Insulation resistance	>5 MΩ (500 V DC)
Ground	Class 3
Environment	Avoid environments containing corrosive gases, install in a dust-free location.
Certifications ①	UL / CSA / CE / DNV / NK / LR / ABS / GL

① Approvals and CE certifications for MELSEC System Q as described on the following pages.

MELSEC Networks

TCP/IP ETHERNET

Ready for immediate operation with the worldwide standard TCP/IP protocol. A PC connected to the Ethernet has full access to all PLCs in the MELSECNET, all the way down to the I/Os on the production level.

MELSECNET/10/H and -NET(II)

Low-cost cabling, brilliantly simple set-up and maximum availability thanks to redundancy and Floating Master. The maximum coverage is up to 30 km.

MELSECNET/B

A cost-effective alternative within the production level. Enables implementation of easily-manageable configurations for complex applications by means of distributed intelligence.

CC-Link

The network for the control and I/O level comprises capabilities like real-time processing and distributed intelligence. Modules of third-party manufacturers can be integrated.

MELSEC I/O-LINK

Remote module distribution to the machine. Devices of third-party manufacturers can be integrated. Cabling with twisted pair cable in a tree structure.

MELSEC FX Peer-to-Peer

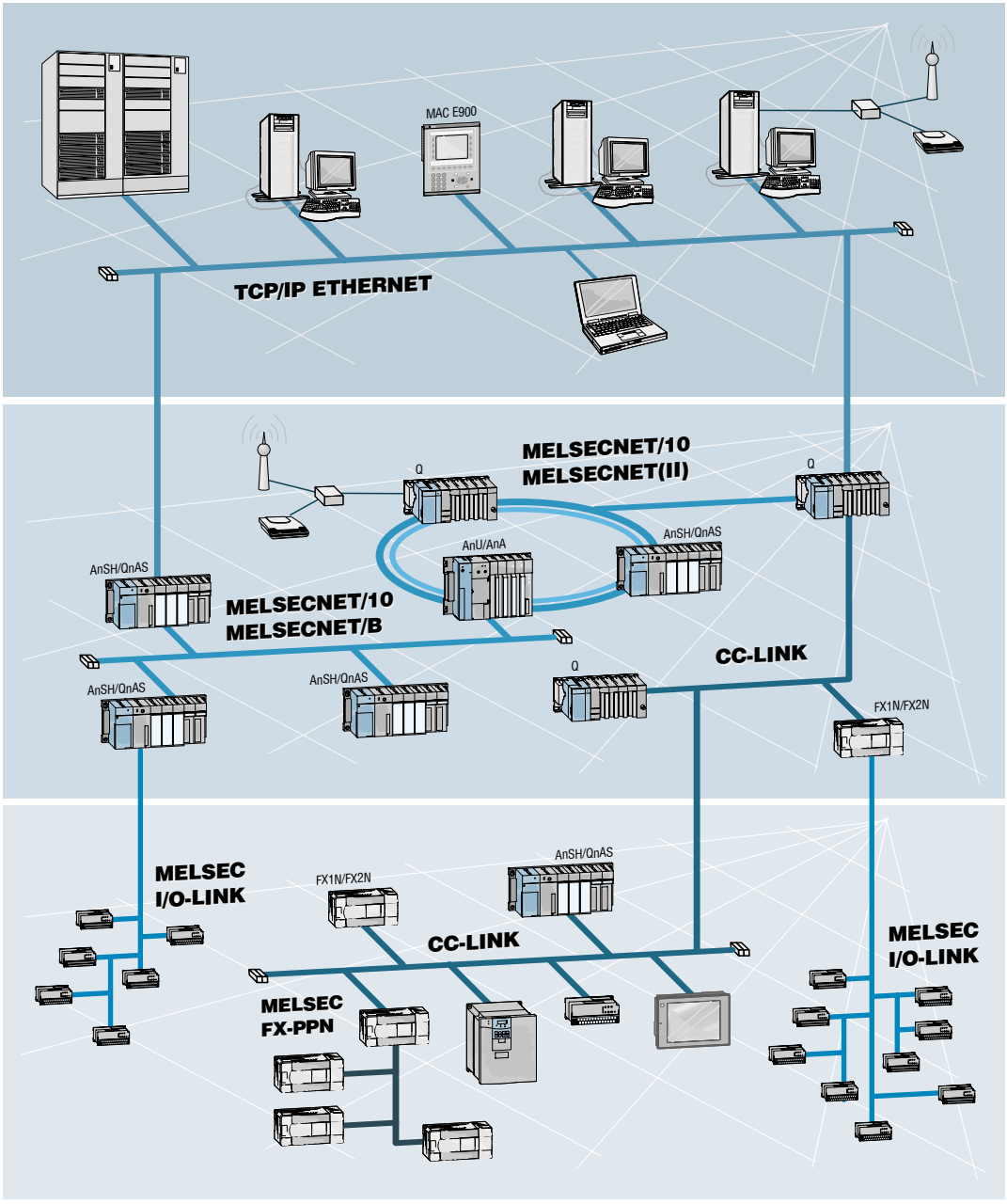
The FX-PPN construction enables a network for up to 8 FX2N controllers as clients. A standard twisted-pair cable can be used as the communications media.

Please refer to the Networks Technical Catalogue for the network modules and accessories for the MELSEC System Q . There you can find further information for the wide network product range of Mitsubishi Electric.

COMMAND LEVEL
TCP/IP ETHERNET

CONTROL LEVEL
CC-Link
MELSECNET/10
MELSECNET/H
MELSECNET(II)
MELSECNET/B

PRODUCTION LEVEL
CC-Link
MELSEC I/O-LINK
MELSEC FX-PPN



Open Networks

MAP 3.0 ETHERNET

Interdepartmental data exchange between the command and production levels using a non-proprietary protocol with short throughput times.

CC-Link

The new open network for the control and I/O level. Sensors and actuators from different manufacturers can be connected. Up to 24 stations can be integrated.

Profibus/FMS

Communication between equipment from different manufacturers within a single plant. Automatic data exchange with MELSEC networks.

Profibus/DP

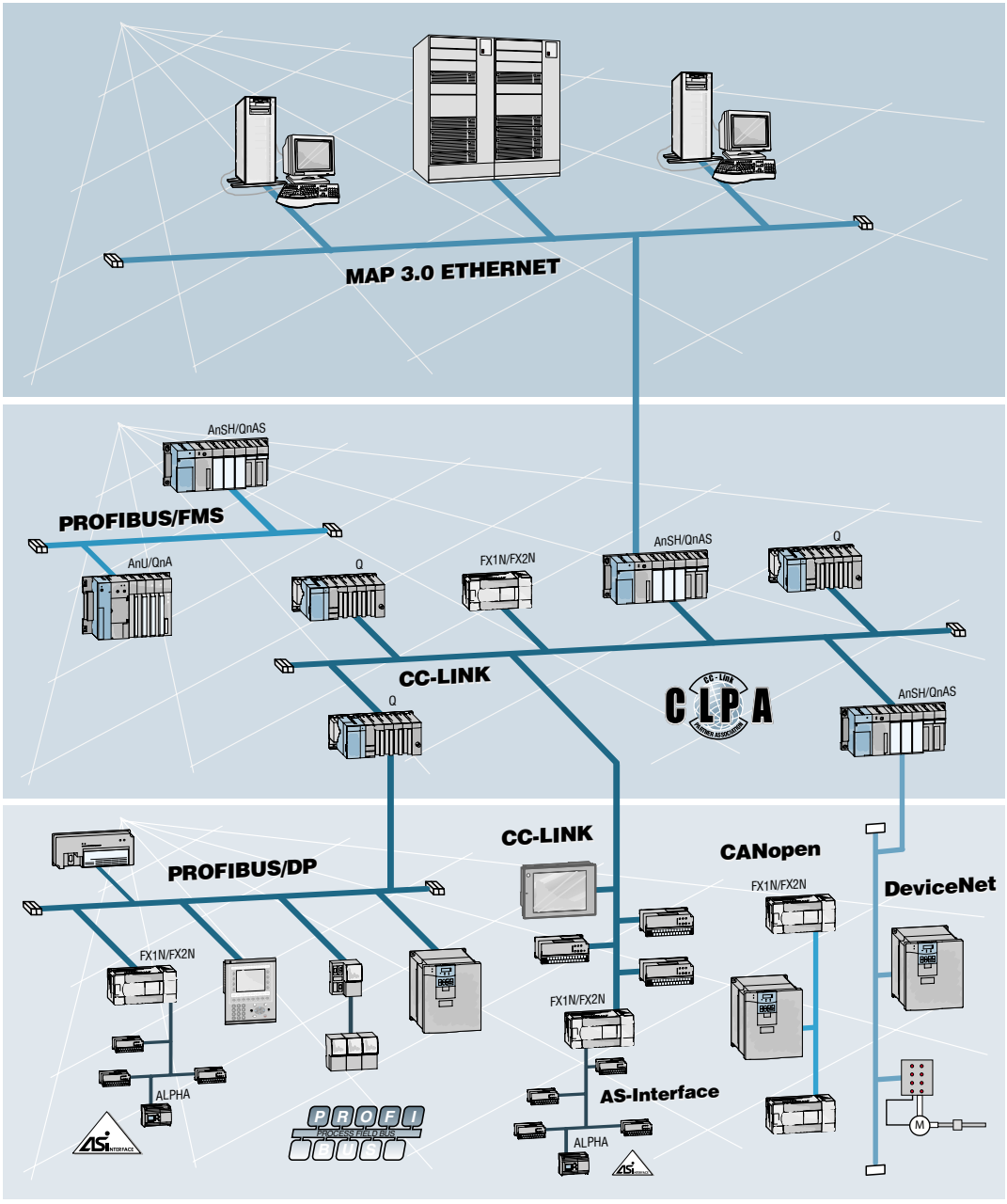
Enables quick and simple connection of sensors and actuators from different manufacturers to MELSEC PLCs, with data transfer rates of up to 12 Mbaud.

DeviceNet

Cost-effective CAN-based network communications. Fault-resistant network structure where components of different manufacturers can be integrated quickly and easily.

AS-Interface

International standard for the lowest field bus level. Connection of conventional sensors and actuators with two-core cable.

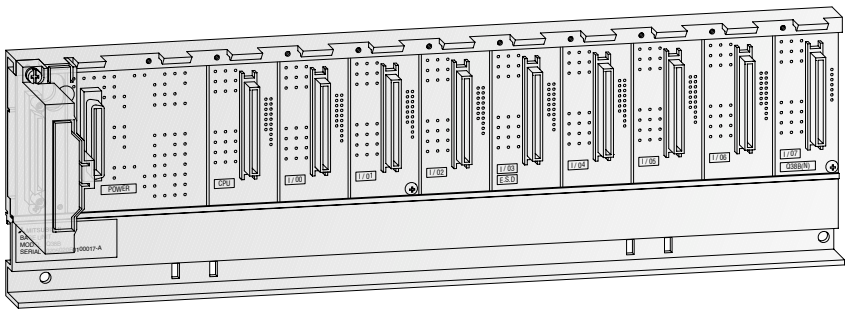


COMMAND LEVEL
MAP 3.0 ETHERNET

CONTROL LEVEL
Profibus/FMS
CC-Link

PRODUCTION LEVEL
Profibus/DP
DeviceNet
AS-Interface
CC-Link
CAN Open

Main Base Units



Main base unit

The main base unit is used for holding and coupling CPUs, power supply unit, input modules, output modules and special function modules.

Special features:

- The modules are automatically addressed.
  The automatic addressing can be changed by means of the function "I/O assignment".
- The units are mounted by means of screws or on a profiled rail with an integrated adapter.

Specifications		Q33B-E	Q35B-E	Q38B-E	Q312B-E
I/O modules		3	5	8	12
Installation		All base units provide an installation hole ∅ 5 mm and M4 screws.			
Weight	kg	0.21	0.25	0.35	0.45
Dimensions (W x H x D)	mm	189 x 98 x 44.1	245 x 98 x 44.1	328 x 98 x 44.1	439 x 98 x 44.1
Order information	Art. no.	136369	127586	127624	129566
Accessories		Connection cables (refer to page 36); adapter for DIN rail mounting (refer to page 39)			

Extension Base Units

The extension base units are connected to the main base unit by means of assembled bus cables. Thus, a Q system can be expanded to max. 7 extension units with up to 64 I/O modules.
The extension units provide a slot for their own power supply module .

Special features:

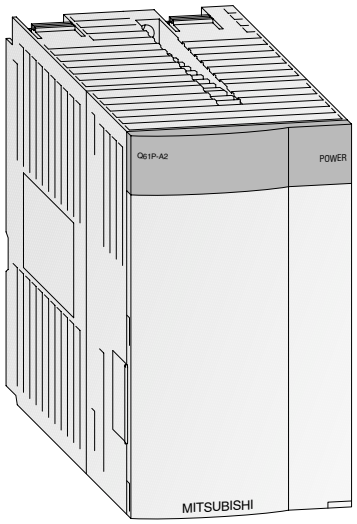
- A total of max. 7 extension units can be connected to a base unit.
- The maximum distance from the first to the last base unit is 13.2 m.

An extension base unit with a power supply module must be used in the following cases:

- If the power consumption of the inserted modules exceeds the capacity of the power supply module on the base unit.
- If the voltage drops below 4.75 V between the base unit and the extension unit.

Specifications		Q52B	Q55B	Q63B	Q65B	Q68B	Q612B
Slots for power supply modules		—	—	1	1	1	1
Slots for I/O modules		2	5	3	5	8	12
Installation		All extension units provide an installation hole ∅ 5 mm and M4 screws.					
Weight	kg	0.14	0.23	0.23	0.25	0.35	0.45
Dimensions (W x H x D)	mm	106 x 98 x 44.1	189 x 98 x 44.1	189 x 98 x 44.1	245 x 98 x 44.1	328 x 98 x 44.1	439 x 98 x 44.1
Order information	Art. no.	140376	140377	136370	129572	129578	129579
Accessories		Connection cables (refer to page 36); adapter for DIN rail mounting (refer to page 39)					

Power Supply Modules



Power supply modules

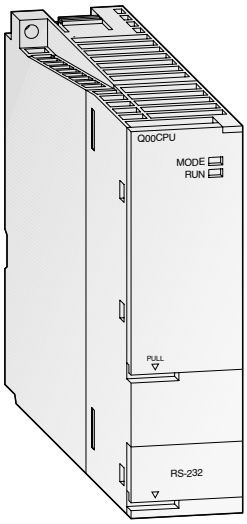
The power supply modules supply the voltages required for operation to the the individual modules. The choice is dependent on the power consumption of the individual modules (this is especially important when using multiple CPUs) .

Special features:

- The readiness for operation is indicated by a red LED.
- By use of the power supply Q63P it is possible that controllers can be supplied by means of additional 24 V DC output.
- The power supply modules Q62P and Q64P can be used world-wide because they support the wide input range from 100 to 240 V AC at 50/60 Hz.

Specifications			Q61P-A1	Q61P-A2	Q62P	Q63P	Q64P
Input voltage	(+10%, -15%)	V AC	100 – 120	200 – 240	100 – 240	—	100 – 240
	(+30%, -35%)	V DC	—	—	—	24	—
Input frequency		Hz	50 / 60 (±5 %)	50 / 60 (±5 %)	50 / 60 (±5 %)	—	50 / 60 (±5 %)
Inrush current			20 A within 8 ms	20 A within 8 ms	20 A within 8 ms	81 A within 1 ms	20 A within 1 ms
Max. input apparent power			105 VA	105 VA	105 VA	45 W	160 VA
Rated output current	5 V DC	A	6	6	3	6	8,5
	24 V DC ±10 %	A	—	—	0.6	—	—
Overcurrent protection	5 V DC	A	≥ 6.6	≥ 6.6	≥ 3.3	≥ 5.5	≥ 14.4
	24 V DC	A	—	—	≥ 0.66	—	—
Overvoltage protection	5 V DC	V	5.5 – 6.5	5.5 – 6.5	5.5 – 6.5	5.5 – 6.5	5.5 – 6.5
Efficiency			≥ 70 %	≥ 70 %	≥ 65 %	≥ 70 %	≥ 70 %
Insulation withstand voltage	between primary and 5 V DC		2830 V AC, 1 min.	2830 V AC, 1 min.	2830 V AC, 1 min.	500 V AC, 1 min.	2830 V AC, 1 min.
	between primary and 24 V DC		—	—	2830 V AC, 1 min.	—	—
Max. compensation time at power failure		ms	20	20	20	10	20
Power indicator			All modules possess a power LED display.				
Terminal screw size			All modules possess terminal screw size M 3.5 x 7 mm.				
Applicable wire size			0.3 – 2 mm² (AWG 18–14)	0.3 – 2 mm² (AWG 18–14)	0.3 – 2mm² (AWG 18–14)	0.3 – 2 mm² (AWG 16–22)	0.75 – 2 mm² (AWG 11–22)
Weight		kg	0.30	0.30	0.39	0.50	0.40
Dimensions (W x H x D)		mm	59.2 x 98 x 90	59.2 x 98 x 90	59.2 x 98 x 90	59.2 x 98 x 90	59.2 x 98 x 115
Order information		Art. no.	129564	127593	140379	136371	140718

■ PLC CPU Modules



The basic PLC CPUs

The CPU modules of the MELSEC System Q are available as single and multi processor CPUs through which they achieve a wide application range. The performance of the controller here grows with the application by simply replacing the CPU (except Q00J).

While Q00CPU and Q01CPU are classical separate CPUs, the Q00JCPU forms an inseparable unit consisting of CPU, power supply and base unit and thus enables a low-priced entry into the modular PLC technology.

The standard CPUs were developed especially for applications where a compact system configuration easily to be realized is to the fore.

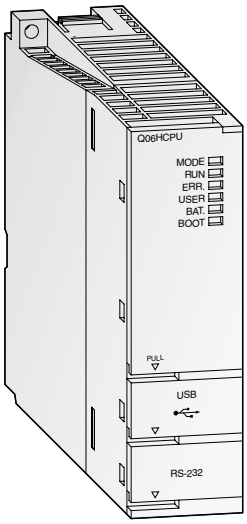
Special features:

- Every CPU is equipped with an RS232C interface for easy programming and monitoring from a personal computer or operating panel.
- Integrated Flash ROMs for memory operation without additional memory cards
- Processing the inputs and outputs with refresh mode

Specifications		Q00JCPU-E	Q00CPU	Q01CPU
Type		Combination of CPU module (single processor), 5 slot base unit and power supply	CPU module (single processor)	CPU module (single processor)
I/O points		256/2048	1024/2048	1024/2048
CPU self-diagnostic functions		CPU error detection, Watch Dog, battery error detection, memory error detection, program check, power supply error detection, fuse error detection		
Multi processor operation		Not possible	With PPC-CPU, Q172CPUN, Q173CPUN only	With PPC-CPU, Q172CPUN, Q173CPUN only
Battery buffer		All CPU modules are fitted with a lithium-battery with a life expectancy of 5 years.		
Memory type		ROM	RAM, ROM	RAM, ROM
Memory capacity	overall	58 kByte	94 kByte	94 kByte
	max. for PLC program	8 k steps (32 kByte)	8 k steps (32 kByte)	14 k steps (56 kByte)
Program cycle period		0.20 µs/log. instruction	0.16 µs/log. instruction	0.10 µs/log. instruction
Timer (T)		512	512	512
Counter (C)		512	512	512
Internal / special relay (M)		8192	8192	8192
Data register / special register (D)		11136	11136	11136
File register (R) ①		—	32768	32768
Interrupt pointer (I)		128	128	128
Pointer (P)		300	300	300
Annunciator (F)		1024	1024	1024
Index register (Z)		10	10	10
Link relay (B) / link register (W)		2048 / 2048	2048 / 2048	2048 / 2048
Number of connectable extensions		2	4	4
Max. number of insertable modules		16	24	24
Internal power consumption (5 V DC)	mA	220	250	270
Weight	kg	0.66 ②	0.13	0.13
Dimensions (W x H x D)	mm	245 x 98 x 98 ②	27.4 x 98 x 89.3	27.4 x 98 x 89.3
Order information	Art. no.	140378	138323	138324
Accessories		—		

① Number depends on memory configuration. ② All specifications refer to the entire unit incl. base unit and power supply unit.

PLC CPU Modules



High-performance PLC CPUs

With the high-performance CPUs a high processing speed and expandability are to the fore. They provide a great variety of functions and an even optimized programming and debugging environment to ensure a flexible response to all systems.

The two process CPU models Q12PHCPU and Q25PHCPU have extended control functions with two degrees of freedom, PID cascading and autotuning. These processors also feature a set of 52 process instructions and support an unlimited number of PID loops.

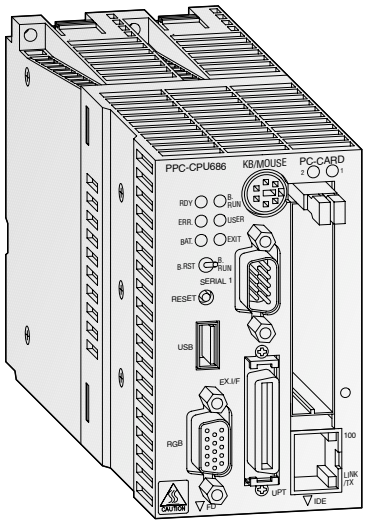
Special features:

- Every multi processor H-CPU is equipped with an USB interface for easy programming and monitoring from a personal computer.
- Processing the inputs and outputs with refresh mode
- Floating point arithmetic according to IEEE 754
- Special statements for processing PID control loops
- Mathematical functions, such as angle/exponential functions and logarithm
- Hot-swap module replacement in RUN mode (with process CPUs)
- Multi processor mode is possible with up to 4 CPU modules.

Specifications		Q02CPU	Q02HCPU	Q06HCPU	Q12HCPU	Q25HCPU	Q12PHCPU	Q25PHCPU
Type		Multi processor CPU module					Process CPU module	
I/O points		4096/8192	4096/8192	4096/8192	4096/8192	4096/8192	4096/8192	4096/8192
CPU self-diagnostic functions		CPU error detection, Watch Dog, battery error detection, memory error detection, program check, power supply error detection, fuse error detection						
Multiprocessor mode		Up to 4 CPU modules can be used in combination on one base unit.						
Battery buffer		All CPU modules are fitted with a lithium-battery with a life expectancy of 5 years.						
Memory type		RAM, ROM, FLASH	RAM, ROM, FLASH	RAM, ROM, FLASH	RAM, ROM, FLASH	RAM, ROM, FLASH	RAM, ROM, FLASH	RAM, ROM, FLASH
Memory capacity	overall	≤ 32 MByte	≤ 32 MByte	≤ 32 MByte	≤ 32 MByte	≤ 32 MByte	≤ 32 MByte	≤ 32 MByte
	max. for PLC program	28 k steps (112 kByte)	28 k steps (112 kByte)	60 k steps (240 kByte)	124 k steps (496 kByte)	252 k steps (1008 kByte)	124 k steps (496 kByte)	252 k steps (1008 kByte)
Program cycle period		79 ns/ log. instruction	34 ns/ log. instruction	34 ns/ log. instruction	34 ns/ log. instruction	34 ns/ log. instruction	34 ns/ log. instruction	34 ns/ log. instruction
Timer (T)		2048	2048	2048	2048	2048	2048	2048
Counter (C)		1024	1024	1024	1024	1024	1024	1024
Internal / special relay (M)		8192	8192	8192	8192	8192	8192	8192
Data register / special register (D)		12288	12288	12288	12288	12288	12288	12288
File register (R) ①		32768 / max. 1042432	65536 / max. 1042432	65536 / max. 1042432	131072 / max. 1042432	131072 / max. 1042432	131072 / max. 1042432	131072 / max. 1042432
Interrupt pointer (I)		256	256	256	256	256	256	256
Pointer (P)		4096	4096	4096	4096	4096	4096	4096
Annunciator (F)		2048	2048	2048	2048	2048	2048	2048
Index register (Z)		16	16	16	16	16	16	16
Link relay (B) / link register (W)		8192 / 8192	8192 / 8192	8192 / 8192	8192 / 8192	8192 / 8192	8192 / 8192	8192 / 8192
Number of connectable extensions		7	7	7	7	7	7	7
Max. number of insertable modules		64	64	64	64	64	64	64
Internal power consumption (5 V DC)	mA	600	640	640	640	640	640	640
Max. compensation time at power failure	ms	Varies according to the type of power unit						
Weight	kg	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Dimensions (W x H x D)	mm	27.4 x 98 x 89.3	27.4 x 98 x 89.3	27.4 x 98 x 89.3	27.4 x 98 x 89.3	27.4 x 98 x 89.3	27.4 x 98 x 89.3	27.4 x 98 x 89.3
Order information	Art. no.	132561	127585	130216	130217	130218	143529	143530
Accessories		Memory cards (refer to page 38)					Software PX-Developer	

① Number depends on memory configuration

■ PC CPU Module



The personal computer for the base unit

The PC CPU module is a compact personal computer of high value which can be installed on the main base unit. Here the Q-PC masters PC typical applications as well as PLC appliations. Therefore, it is suitable as an integrated PC within control systems - e.g. for visualization, data bases, and log-trace functions of the Microsoft application or for programming the System Q in a high-level language. In addition, the system can be controlled as soft PLC according to IEC1131 via the optional SX-Controller software.

For the connection to the peripherals I/O and special function modules from the MELSEC System Q can be used.

Special features:

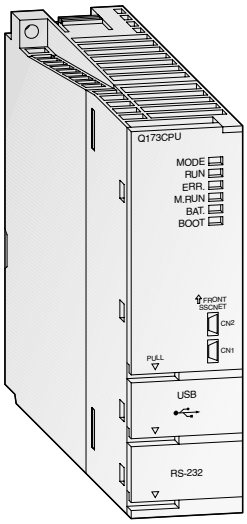
- Employing with low power consumption and high speed Intel CPU (400 MHz), enabling processing of a large amount of data at high speed
- Windows NT(e) and Windows 2000 OSs are supported
- Capable of connecting silicon disk units for use in a place subject to vibration and shock
- Outstanding noise immunity
- Fan-less operation and suitable for clean-room applications
- Control of a complete system in a high-level language such as C++ or Visual Basic supported

Specifications			PPC-CPU 686(MS)-128
Type			Personal Computer CPU
CPU			Mobile Celereon processor
Processing frequency		MHz	400
Memory		Mbyte	128 (main) / 2 (cache)
Video			Integrated graphics board for a maximum resolution of 1024 x 768 pixles and 65536 colours
Interfaces	serial (RS232C)		2 (1 integrated 9-pin D-SUB connector and 1 optional interface at the extension box which is connnected to "EX I/F")
	parallel		1
	USB		2 (1 integrated 9-pin D-SUB connector and 1 optional interface at the extension box which is connnected to "EX I/F")
	keyboard/mouse		1 x PS/2 connector (keyboard and mouse can be used at the same time with the conversion cable PPC-YCAB-01.)
	LAN		1 x ETHERNET interface (100BASE-TX/10BASE-T)
	monitor		1 x 15-pin H-DSUB
Connections for drives			1 x disk drive, 2 x hard disk (silicon hard disks are supported)
PC card slots			2 PCMCIA
No. of occupied I/O points			4096/8192
Internal power consumption (5 V DC)		mA	3000
Weight		kg	0.47
Dimensions (W x H x D)		mm	55.2 x 98 x 115

Order information			
	PPC-SET-200	art. no.: 140108	set with 1 x PC CPU module; 128 MB RAM, no hard disk, driver PPC-DRV-01, without operating system
	PPC-SET-21A	art. no.: 139815	set with 1 x PC CPU module; 128 MB RAM, 20 GB hard disk, driver PPC-DRV-01, operating system WinNT4.0
	PPC-SET-21B	art. no.: 139816	set with 1 x PC CPU module; 128 MB RAM, 20 GB hard disk, driver PPC-DRV-01, operating system Windows 2000
	PPC-SET-22C	art. no.: 139817	set with 1 x PC CPU module; 128 MB RAM, 320 MB silicon disk, driver PPC-DRV-01, operating system WinNTe4.0

Accessories	
	Additional hard disks, external drives, cables etc. (refer to pages 40 and 41); Soft PLC for the Q PC CPU: SX-Controller for Windows NT/2000 without realtime environment (SX-Controller V0100-1L0C-E, art. no.: 144006)

Motion CPU Modules



The high-speed dynamic motion CPU

The motion controller CPU controls and synchronizes the connected servo amplifiers and servo motors. A motion system besides the controller CPU as well includes a PLC CPU. Only after combining a highly dynamic positioning control and a PLC an innovative and autarkical motion control system is created.

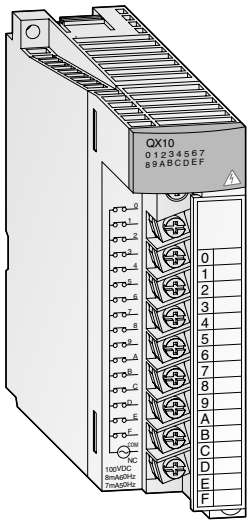
While the Motion CPU controls large-scale servo movements the PLC CPU is responsible for the machine control and the communication at the same time.

Special features:

- Using multiple CPUs to distribute the load improves the overall performance of the whole system
- Use of up to 3 motion CPUs within one system
- Large scale control system for up to 96 axes per system
- Interpolation of 4 axes simultaneously
- Software cam control
- Virtual and real master axes
- Integration in the high-speed SSCNET network for communication with high-performance servo amplifiers at up to 5.6 Mbit/s

Specifications			Q172CPUN	Q173CPUN
Type			Motion CPU	Motion CPU
I/O points			8192	8192
No. of control axes			8	32
Interpolation functions			Linear interpolation for up to 4 axes, circular interpolation for 2 axes, helical interpolation for 3 axes	
Positioning	method		PTP (point to point), 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)	
	acceleration/ deceleration control		Automatic trapezoidal acceleration/deceleration, S-curve acceleration/deceleration	
	compensation		Backlash compensation, electronic gear	
Programming language			Motion SFC, dedicated instructions, software for conveyor assembly (SV13), virtual mechanical support language (SV22)	
Processing speed	SV13		0.88 ms (1. – 8. axis)	0.88 ms (1. – 8. axis), 1.77 ms (9. – 16. axis), 3.55 ms (17. – 32. axis)
	SV22		0.88 ms (1. – 4. axis), 1.77 ms (5. – 8. axis)	0.88 ms (1. – 4. axis), 1.77 ms (5. – 12. axis), 3.55 ms (13. – 24. axis), 7.11 ms (25. – 32. axis)
Program capacity			14 k steps	
No. of positioning points			3200	
Program execution	number of multi executed programs		Max. 256	
	number of multi active steps		Max. 256 steps in all programs	
	executed tasks	normal	Executed in motion main cycle	
		interrupt	Executed in fixed cycles (0.88 ms, 1.7 ms, 3.5 ms, 7.1 ms, 14.2 ms) 16 external interrupt points (QI60 interrupt module inputs), executed with interrupt from PLC CPU (when executing the S(P).GINT instruction)	
		NMI	16 points; executed when input ON is set among an interrupt module (e.g. QI60)	
Interfaces			USB, RS232C, SSCNET	
Real I/O points (PX/PY)			256 (these I/Os can be allocated directly to the motion CPU)	
Internal power consumption (5 V DC)		A	1.62	1.75
Weight		kg	0.25	0.25
Dimensions (W x H x D)		mm	27.4 x 98 x 114.3	27.4 x 98 x 114.3
Order information		Art. no.	142695	142696
Accessories			Manual pulse generator, encoder, interface module (for detailed informations please refer to the technical catalogue "Motion Controller System Q".)	

■ Digital Input Modules



Detection of process signals

Various input modules are available for converting the digital process signals with different voltage levels into the levels required by the PLC.

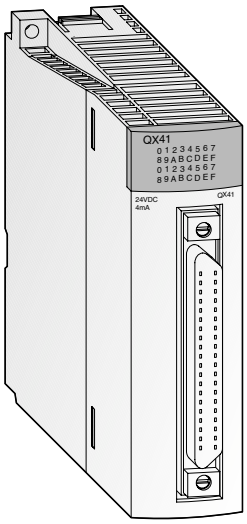
Special features:

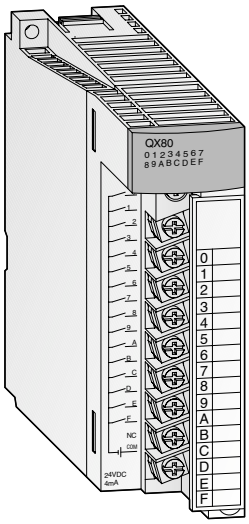
- Potential isolation between process and control by means of an optocoupler is a standard feature.
- Indication of input status via LEDs
- Modules with 16 connection points have removable terminal blocks with screws.
- Assembled cables are available for modules with plugs (Q32CBL: 3 m or 5 m; Q40CBL: 3 m or 5 m).
- Different system terminals for module wiring simplification are availabe (refer to page 35)

Specifications			QX10	QX28	QX40	QX40-S1	QX41	QX41-S1
Input points			16	8	16	16	32	32
Insulation method			Photocoupler isolation between input terminals and PC power for all modules.					
Rated input voltage			100 – 120 V AC (50 / 60 Hz)	100 – 240 V AC (50/60 Hz)	24 V DC	24 V DC	24 V DC	24 V DC
Operating voltage range		V	85 – 132	85 – 264	20.4 – 28.8	20.4 – 28.8	20.4 – 28.8	20.4 – 28.8
Max. simultaneously ON ③ (at rated voltage)			100 % ②	100 %	100 % (sink type)	100 % (sink type)	100 % (sink type)	100 % (sink type)
Inrush current			200 mA for 1 ms (at 132 V AC)	200 mA for 1 ms (at 132 V AC)	—	—	—	—
Rated input current		mA	7 (at 100 V AC, 50 Hz), 8 (at 100 V AC, 60 Hz)	7 (at 100 V AC, 50 Hz), 8 (at 100 V AC, 60 Hz), 14 (at 200 V AC, 50 Hz), 17 (at 200 V AC, 60 Hz)	approx. 4	approx. 6	approx. 4	approx. 4
ON	voltage	V	≥ AC 80	≥ AC 80	≥ DC 19	≥ DC 19	≥ DC 19	≥ DC 19
	current	mA	≥ AC 5	≥ AC 5	≥ DC 3	≥ DC 4	≥ DC 3	≥ DC 4
OFF	voltage	V	≤ AC 30	≤ AC 30	≤ DC 11	≤ DC 11	≤ DC 11	≤ DC 9.5
	current	mA	≤ AC 1	≤ AC 1	≤ DC 1.7	≤ DC 1.7	≤ DC 1.7	≤ DC 1.5
Load resistance		kΩ	approx. 18 (50 Hz) approx. 15 (60 Hz)	approx. 15 (50 Hz) approx. 12 (60 Hz)	approx. 5.6	approx. 3.9	approx. 5.6	approx. 5.6
Response time	OFF ⟶ ON	ms	≤ 15 (100 V AC, 50/60 Hz)	≤ 15 (100 V AC, 50/60 Hz)	1 – 70 ①	0.05 – 1.2 ①	1 – 70 ①	0.05 – 1.2 ①
	ON ⟶ OFF	ms	≤ 20 (100 V AC, 50/60 Hz)	≤ 20 (100 V AC, 50/60 Hz)	1 – 70 ①	0.15 – 1.3 ①	1 – 70 ①	0.15 – 1.3 ①
Common terminal arrangement			16	8	16	16	32	32
Power indicator			All modules possess a status LED per input/output.					
Connection terminal			18-point removable terminal block	18-point removable terminal block	18-point removable terminal block	18-point removable terminal block	40-pin connector	40-pin connector
No. of occupied I/O points			16	16	16	16	32	32
Applicable wire size		mm^2	0.3 – 0.75	0.3 – 0.75	0.3 – 0.75	0.3 – 0.75	0.3	0.3
Internal power consumption (5 V DC)		mA	50 (all input points ON)	50 (all input points ON)	50 (all input points ON)	60 (all input points ON)	75 (all input points ON)	75 (all input points ON)
Weight		kg	0.17	0.20	0.16	0.20	0.15	0.15
Dimensions (W x H x D)		mm	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90
Order information		Art. no.	129581	136396	132572	136574	132573	146921
Accessories			40-pin connector and ready to use connection cables and system terminals (refer to page 35–37); Spring clamp terminal block for exchange against the standard screw terminal block (refer to page 38); IDC terminal block adapter for all 32 point I/O modules with 40-pin connector (refer to page 38)					

① CPU parameter setting (default setting: 10 ms) ② at 45 °C ③ Please refer to page 43 for diagrams showing the simultaneously switchable inputs.

Digital Input Modules

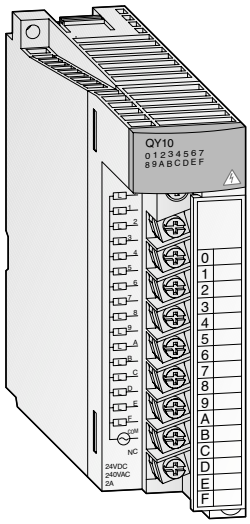




Specifications			QX42	QX42-S1	QX70	QX71	QX72	QX80	QX81	QX82	QX82-S1
Input points			64	64	16	32	64	16	32	64	64
Insulation method			Photocoupler isolation between input terminals and PC power for all modules.								
Rated input voltage			24 V DC	24 V DC	5 – 12 V DC	5 – 12 V DC	5 – 12 V DC	24 V DC	24 V DC	24 V DC	24 V DC
Operating voltage range		V	20.4 – 28.8	20.4 – 28.8	4.25 – 14.4	4.25 – 14.4	4.25 – 14.4	20.4 – 28.8	20.4 – 28.8	20.4 – 28.8	20.4 – 28.8
Max. simultaneously ON ③ (at rated voltage)			100 % ② (sink type)	100 % ② (sink type)	100 %	100 %	100 %	100 %	100 %	100 % ②	100 % ②
Inrush current			—	—	—	—	—	—	—	—	—
Rated input current		mA	approx. 4	approx. 4	approx. 1.2 (at 5 V DC) approx. 3.3 (at12 V DC)	approx. 1.2 (at 5 V DC) approx. 3.3 (at 12 V DC)	approx. 1.2 (at 5 V DC) approx. 3.3 (at 12 V DC)	approx. 4	approx. 4	approx. 4	approx. 4
ON	voltage	V	≥ DC 19	≥ DC 19	≥ DC 3.5	≥ DC 3.5	≥ DC 3.5	≥ DC 19	≥ DC 19	≥ DC 19	≥ DC 19
	current	mA	≥ DC 3	≥ DC 3	≥ DC 1	≥ DC 1	≥ DC 3	≥ DC 3	≥ DC 3	≥ DC 3	≥ DC 3
OFF	voltage	V	≤ DC 11	≥ DC 9.5	≥ DC 1	≤ DC 1	≤ DC 1	≤ DC 11	≤ DC 11	≤ DC 11	≤ DC 9,5
	current	mA	≤ DC 1.7	≥ DC 1.5	≥ DC 0.1	≤ DC 0.1	≤ DC 0.1	≤ DC 1.7	≤ DC 1.7	≤ DC 1,7	≤ DC 1,5
Load resistance		kΩ	approx. 5.6	approx. 5.6	approx. 3.3	approx. 3.3	approx. 3.3	approx. 5.6	approx. 5.6	approx. 5.6	approx. 5.6
Response time	OFF ⟶ ON	ms	1 – 70 ①	0.05 – 1.2 ①	1 – 70 ①	1 – 70 ①	1 – 70 ①	1 – 70 ①	1 – 70 ①	1 – 70 ①	0.1 – 1 ①
	ON ⟶ OFF	ms	1 – 70 ①	0.15 – 1.3 ①	1 – 70 ①	1 – 70 ①	1 – 70 ①	1 – 70 ①	1 – 70 ①	1 – 70 ①	0.1 – 1 ①
Common terminal arrangement			32	32 x 2	16	32	32 x 2	16	32	32 x 2	32 x 2
Power indicator			All modules with 16 and 32 inputs possess a status LED per input. For modules with 64 inputs the indication is switchable.								
Connection terminal			40-pin connector x 2	40-pin connector x 2	18-point removable terminal block	40-pin connector	40-pin connector x 2	18-point removable terminal block	Compact connector 37-pin D-Sub	40-pin connector x 2	40-pin connector x 2
No. of occupied I/O points			64	64	16	32	64	16	32	64	64
Applicable wire size		mm^2	0.3	0.3	0.3 – 0.75	0.3	0.3	0.3 – 0.75	0.3	0.3	0.3
Internal power consumption (5 V DC)		mA	90 (all input points ON)	90 (all input points ON)	55 (all input points ON)	70 (all input points ON)	85 (all input points ON)	50 (all input points ON)	75 (all input points ON)	90 (all input points ON)	90 (all input points ON)
Weight		kg	0.18	0.18	0.14	0.12	0.13	0.16	0.16	0.18	0.18
Dimensions (W x H x D)		mm	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90
Order information		Art. no.	132574	146922	136397	136398	136399	127587	129594	150836	150837
Accessories			40-pin connector and ready to use connection cables and system terminals (refer to page 35–37); Spring clamp terminal block for exchange against the standard screw terminal block (refer to page 38); IDC terminal block adapter for all 32 point I/O modules with 40-pin connector (refer to page 38)								

① CPU parameter setting (default setting: 10 ms) ② at 45 °C ③ Please refer to page 43 for diagrams showing the simultaneously switchable inputs.

■ Digital Output Modules



Adapted output technology

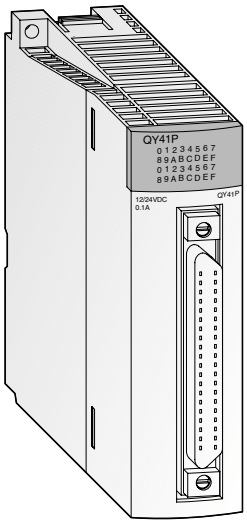
The MELSEC System Q output modules have different switching elements for adaptation to many control tasks.

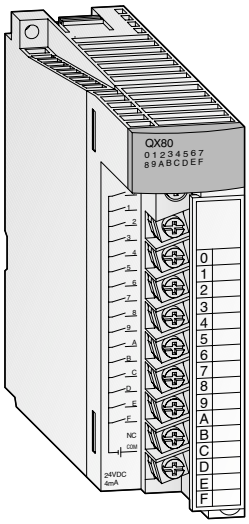
Special features:

- Output modules with relay, transistor or triac switches
- Potential isolation between process and control by means of an optocoupler is a standard feature
- Modules with potential isolation between the channels
- Modules with 16 protection points have removable terminal blocks with screws
- Assembled cables are available for modules with D-sub plugs (Q32CBL: 3 m or 5 m; Q40CBL: 3 m or 5 m).
- Different system terminals for simplified cabling and to supplement the performance of the modules are availabe (refer to page 35).

Specifications			QY10	QY18A	QY22	QY40P	QY41P	QY42P	QY50
Outputs			16	8	16	16	32	64	16
Output type			Relay	Relay	Triac	Transistor (sink type)	Transistor (sink type)	Transistor (sink type)	Transistor (sink type)
Common terminal arrangement		points	16	18	16	16	32	32	16
Insulation method			Relay	Relay	Photocoupler isolation between output terminals and PC power				
Rated output voltage			24 V DC / 240 V AC	24 V DC / 240 V AC	100 – 240 V AC	12 / 24 V DC (sink type)	12 / 24 V DC (sink type)	12 / 24 V DC (sink type)	12 / 24 V DC (sink type)
Operating voltage range			—	—	—	10.2 – 28.8 V DC	10.2 – 28.8 V DC	10.2 – 28.8 V DC	10.2 – 28.8 V DC
Min. switching load			5 V DC (1 mA)	5 V DC (1 mA)	24 V AC (100 mA) 100 V AC (25 mA) 240 V AC (25 mA)	—	—	—	—
Max. switching voltage			125 V DC / 264 V AC	125 V DC / 264 V AC		—	—	—	—
Max. output current		A	2	2	0.6	0.1	0.1	0.1	0.5
Output current per group TYP		A	8	8	4.8	1.6	2	2	4
Inrush current			—	—	—	0.7 for 10 ms	0.7 for 10 ms	0.7 for 10 ms	0.7 for 10 ms
Leakage current at OFF		mA			≤ 1.5 mA (120 V AC), ≤ 3 mA (240 V AC)	≤0.1 mA	≤ 0.1 mA	≤ 0.1 mA	≤ 0.1 mA
Response time	OFF ⟶ ON	ms	≤ 10	≤ 10	1	≤ 1	≤ 1	≤ 1	≤ 1
	ON ⟶ OFF	ms	≤ 12	≤ 12	1	≤ 1	≤ 1	≤ 1	≤ 1
Life	mechanical		Switching 20 million times		—	—	—	—	—
	electrical		Switching 100000 times or more		—	—	—	—	—
Max. switching frequency			Switching 3600 times/h		—	—	—	—	—
Noise suppression			—	—	RC-	Zener diode	—	—	Zener diode
Fuse		A	—	—	—	—	short-circuit proof	short-circuit proof	6.7
Power indicator			All modules possess a status LED per output.						
Fuse blown indicator			—	—	—	—	—	—	LED
Connection terminal			18-point removable terminal block				40-pin connector	40-pin connector x 2	18-point removable terminal block
No. of occupied I/O points			16	16	16	16	32	64	16
Applicable wire size		mm^2	0.3 – 0.75	0.3 – 0.75	0.3 – 0.75	0.3 – 0.75	0.3	0.3	0.3 – 0.75
Ext. power supply req.	voltage		—	—	—	12 – 24 V DC	12 – 24 V DC	12 – 24 V DC	12 – 24 V DC
	current	mA	—	—	—	10 (24 V DC)	20 (24 V DC)	20 (24 V DC)	20 (24 V DC)
Internal power consumption (5 V DC)		mA	430	430	250	65	105	150	80
Weight		kg	0.22	0.22	0.40	0.16	0.15	0.17	0.17
Dimensions (W x H x D)		mm	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90
Order information		Art. no.	129605	136401	136402	132575	132576	132577	132578
Accessories			40-pin connector and ready to use connection cables and system terminals (refer to page 35–37); Spring clamp terminal block for exchange against the standard screw terminal block (refer to page 38); IDC terminal block adapter for all 32 point I/O modules with 40-pin connector (refer to page 38)						

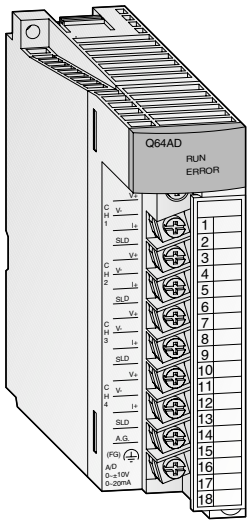
Digital Output Modules





Specifications			QY68A	QY70	QY71	QY80	QY81P
Outputs			8	16	32	16	32
Output type			Transistor (sink/source type)	Transistor (sink type)	Transistor (sink type)	Transistor (source type)	Transistor (source type)
Common terminal arrangement		points	All independent	16	32	16	32
Insulation method			Photocoupler isolation between output terminals and PC power				
Rated output voltage			5 – 24 V DC	5 / 12 V DC (sink type)	5 / 12 V DC (sink type)	12 / 24 V DC (source type)	12 / 24 V DC (source type)
Operating voltage range			4.5 – 28.8 V DC	—	—	10.2 – 28.8 V DC	10.2 – 28.8 V DC
Min. switching load			—	—	—	—	—
Max. switching voltage			—	—	—	—	—
Max. output current		A	2	0.016	0.016	0.5	0.1
Output current per group TYP		A	—	0.256	0.512	4	2
Inrush current			8 A for 10 ms	40 mA for 10 ms	40 mA for 10 ms	4 A for ≤ 10 ms	0.7 A for ≤ 10 ms
Leakage current at OFF		mA	≤ 0.1	—	—	≤ 0.1	≤ 0.1
Response time	OFF → ON	ms	≤ 3	≤ 0.3	≤ 0.3	1	1
	ON → OFF	ms	≤ 10	≤ 0.3	≤ 0.3	1	1
Life	mechanical		—	—	—	—	—
	electrical		—	—	—	—	—
Max. switching frequency			—	—	—	—	—
Noise suppression			Zener diode	—	—	Zener diode	Zener diode
Fuse		A	—	1,6	1,6	4 A (2 pices)	short-circuit proof
Power indicator			All modules possess a status LED per output.				
Fuse blown indicator			—	LED	LED	LED	LED
Connection terminal			18-point removable terminal block	18-point removable terminal block	40-pin connector	18-point removable terminal block	Compact connector 37-pin D-Sub
No. of occupied I/O points			16	16	32	16	32
Applicable wire size		mm^2	0.3 – 0.75	0.3 – 0.75	0.3	0.3 – 0.75	0.3
Ext. power supply req.	voltage		—	5 / 12 V DC	5 – 12 V DC	12 – 24 V DC	12 – 24 V DC
	current	mA	—	90 (12 V DC)	170 (12 V DC)	20 mA (24 V DC)	40 mA (24 V DC)
Internal power consumption (5 V DC)		mA	110	95	150	80	95
Weight		kg	0.14	0.14	0.10	0.17	0.15
Dimensions (W x H x D)		mm	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90
Order information		Art. no.	136403	136404	136405	127588	129607
Accessories			40-pin connector and ready to use connection cables and system terminals (refer to page 35–37); Spring clamp terminal block for exchange against the standard screw terminal block (refer to page 38); IDC terminal block adapter for all 32 point I/O modules with 40-pin connector (refer to page 38)				

■ Analog Input Modules



Detection of analog process signals

The analog input modules convert analog process signals, for example pressure, flow or fill level, linearly into digital values, which are further processed by the Q CPU.

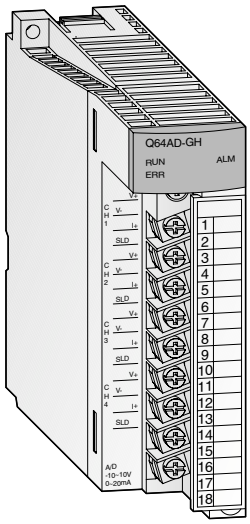
Special features:

- Up to 8 channels per module (Q68AD□) and up to 256 channels per system (Q CPU)
- Resolution of 0.83 mV and 3.33 µA (Q64AD)
- Conversion time of 80 µs/channel (Q68AD□)
- Calculation of average value over the time or measurement cycles can be configured
- Potential isolation between process and control by means of an optocoupler is a standard feature.
- All modules are provided with a removable terminal block fastened with screws.

Specifications			Q64AD		Q68ADV	Q68ADI
Input points			4		8	8
Analog input			-10 V / +10 V (0 mA / +20 mA)		-10 V / +10 V	0 mA / +20 mA
Resolution			16 bits binary (incl. sign)		16 bits binary (incl. sign)	16 bits binary (incl. sign)
Load resistance	voltage	MΩ	1		1	1
	current	Ω	250		250	250
Max. input	voltage	V	±15		±15	±15
	current	mA	±30		±30	±30
I/O characteristics①	analog input		-10 – +10 V	0 – 20 mA	-10 – +10 V	0 – 20 mA
	digital output		1/4000, 1/12000, 1/16000	1/4000, 1/8000, 1/12000	1/4000, 1/12000, 1/16000	1/4000, 1/8000, 1/12000
Max. resolution	voltage input		2.5 mV 1.25 mV 0.83 mV	—	2.5 mV 5 mV 1.25 mV 1 mV	—
	current input		—	10 µA 5 µA 3.33 µA	—	0 – 20 mA 4 – 20 mA
Overall accuracy			±0.4 % (0 – 55 °C), ±0.1 % (20 – 30 °C)		±0.4 % (0 – 55 °C), ±0.1 % (20 – 30 °C)	
Max. conversion time			80 µs/channel (+ 160 µs with temperature drift compensation)		80 µs/channel (+ 160 µs with temperature drift compensation)	
Insulation method			Photocoupler isolation between output terminals and PC power for all modules.		Photocoupler isolation between output terminals and PC power for all modules.	
I/O points			16		16	16
Connection terminal			All modules are fitted with a terminal block with 18 screw terminals.		All modules are fitted with a terminal block with 18 screw terminals.	
External power consumption			Not neccessary		Not neccessary for any module	
Applicable wire size		mm^2	0.3 – 0.75		0.3 – 0.75	0.3 – 0.75
Internal power consumption (5 V DC)		mA	630		640	640
Weight		kg	0.14		0.19	0.19
Dimensions (W x H x D)		mm	27.4 x 98 x 90		27.4 x 98 x 90	27.4 x 98 x 90
Order information		Art. no.	129615		129616	129617

① ±0.4 % (0 – 55 °C), ±0.1 % (20 – 30 °C)

Analog Input Modules



Channel isolated and high resolution

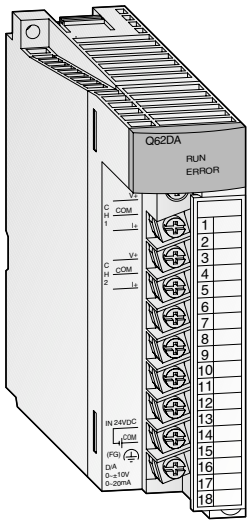
The analog input modules Q62AD-DGH and Q64AD-GH convert analog process signals into digital values with high accuracy. All channels are isolated between each other and against the external power supply with high dielectric withstand voltage for both.

Special features:

- Potential isolation between each channel and between process and control is a standard feature.
- High resolution: 32 bit signed binary
- High accuracy with a reference accuracy of ±0,05 % and a temperature coefficient of ±71,4 ppm/°C
- Integrated short circuit protection by limiting the input current
- Signal conditioning function for the Q62AD-DGH
- A primary delay filter smoothes out the line of digital output values by a user-defined time constant
- All modules are provided with a removable terminal block fastened with screws.

Specifications			Q62AD-DGH	Q64AD-GH	
Input points			2	4	
Analog input			+4 mA / +20 mA	-10 V / +10 V (0 mA / +20 mA)	
Resolution			16 / 32 bits binary (incl. sign)	16 / 32 bits binary (incl. sign	
Load resistance	voltage	MΩ	—	1	
	current	Ω	250	250	
Max. input	voltage	V	±15	±15	
	current	mA	±30	±30	
I/O characteristics	analog input		4 – 20 mA	-10 – +10 V	0 – 20 mA
	digital output		0 – 32000 (16 bits) 0 – 64000 (32 bits)	-32000 to +32000 (16 bits) -64000 to +64000 (32 bits)	0 – 32000 (16 bits) 0 – 64000 (32 bits)
Max. resolution	voltage input		—	0 to 10 V: 156,3 µV (32 bits), 312.6 µV (16 bits) 0 to 5 V: 78.2 µV (32 bits), 156.4 µV (16 bits) 1 to 5 V: 62.5 µV (32 bits), 125.0 µV (16 bits) -10 to 10 V: 156.3 µV (32 bits), 312.6 µV (16 bits)	
	current input		4 to 20 mA: 0.25 µA (32 bits), 0.50 µA (16 bits) User defined: 0.151 µA (32 bits), 0.303 µA (16 bits)	0 to 20 mA: 0.312 µA (32 bits), 0.625 µA (16 bits) 4 to 20 mA: 0.25 µA (32 bits), 0.50 µA (16 bits) User defined: 0.151 µA (32 bits), 0.303 µA (16 bits)	
Overall accuracy			±0.05 %	±0.05 %	
Temperature coefficent			±71.4 ppm/°C (0.00714 %/°C)	±71.4 ppm/°C (0.00714 %/°C)	
Max. conversion time			10 ms/2 channels	10 ms/4 channels	
Insulation method			Transformer isolation between input channels and between the channels and PLC power. Photocoupler isolation between I/O terminals and PLC power	Transformer isolation between input channels. Photocoupler isolation between I/O terminals and PLC power	
I/O points			16	16	
Connection terminal			All modules are fitted with a terminal block with 18 screw terminals.	All modules are fitted with a terminal block with 18 screw terminals.	
External power consumption			24 V DC, 360 mA	Not neccessary	
Applicable wire size		mm^2	0.3 – 0.75	0.3 – 0.75	
Internal power consumption (5 V DC)		mA	220	890	
Weight		kg	0.19	0.20	
Dimensions (W x H x D)		mm	27.4 x 98 x 90	27.4 x 98 x 90	
Order information		Art. no.	145036	143542	

■ Analog Output Modules



Output of analog control signals

The analog output modules convert digital values predetermined by the CPU into an analog current or voltage signal. For example, frequency inverters, valves or slide valves are controlled by means of these signals.

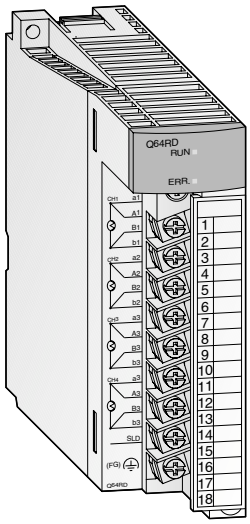
Special features:

- Up to 8 channels per module (Q64DA□) and up to 256 channels per system
- Resolution of 0.333 mV and 0.83 µA
- Conversion time of 80 µs / channel
- Potential isolation between process and control by means of an optocoupler is a standard feature. Additional potential isolation between the channels for the Q62DA-FG.
- Disconnection detection function that monitors the output values by means of re-conversion and limit exceeding function (Q62DA-FG only)
- The modules are provided with a removable terminal block fastened with screws.

Specifications			Q62DA	Q62DA-FG	Q64DA	Q68DAV	Q68DAI
Output points			2	2	4	8	8
Digital input			-4096 – +4095 -12288 –+12287 -16384 – +16383	-4096 – +4095 -12288 –+12287 -16384 – +16383	-4096 – +4095 -12288 –+12287 -16384 – +16383	-4096 – +4095 -12288 –+12287 -16384 – +16383	-4096 – +4095 -12288 –+12287 -16384 – +16383
Analog output			-10 V DC – +10 V DC (0 mA – +20 mA DC)	-10 V DC – +10 V DC (0 mA – +20 mA DC)	-10 V DC – +10 V DC (0 mA – +20 mA DC)	-10 V DC – +10 V DC	0 mA – +20 mA DC
Load resistance	voltage output		1 kΩ – 1 MΩ	1 kΩ – 1 MΩ	1 kΩ – 1 MΩ	1 kΩ – 1 MΩ	—
	current output		0 – 600 Ω	0 – 600 Ω	0 – 600 Ω	—	0 – 600 Ω
Max. outputs	voltage	V	±12	±13	±12	±12	—
	current	mA	21	23	21	—	21
Voltage output①							
I/O characteristics	voltage output		0 – 5 V	0 – 5 V	1 – 5 V	1 – 5 V	-10 – +10 V	-10 – +10 V	user defined	user defined
	digital input		0 – 4000	0 – 12000	0 – 4000	0 – 12000	-4000 – 4000	-16000 – 16000	-4000 – 4000	-12000 – 12000
Max. resolution			1.25 mV	0.416 mV	1.0 mV	0.333 mV	2.5 mV	0.625 mV	0.75 mV	0.333 mV
Current output②							
I/O characteristics	current output		0 – 20 mA	0 – 20 mA	4 – 20 mA	4 – 20 mA	user defined	user defined
	digital input		0 – 4000	0 – 12000	0 – 4000	0 – 12000	-4000 – 4000	-12000 – 12000
Max. resolution			5 µA	4 µA	1.66 µA	1.33 µA	1.5 µA	0.83 µA
Overall accuracy			±0.3 % conforms to voltage ±30 mV, current ±60µA (at 0 – 55 °C); ±0.1 % conforms to voltage ±10 mV, current ±20µA (at 20 – 30 °C)				
Max. conversion time			80 µs / channel	10 ms / 2 channels	80 µs / channel	80 µs / channel	80 µs / channel
Insulation method			Photocoupler isolation between output terminals and PLC power	Transformer isolation between the output channels and between the channels and PLC power. Photocoupler isolation between output terminals and PLC power	Photocoupler isolation between output terminals and PLC power	Photocoupler isolation between output terminals and PLC power	Photocoupler isolation between output terminals and PLC power
I/O points			16	16	16	16	16
Connection terminal			All modules are fitted with a removable terminal block with 18 screw terminals.				
Applicable wire size		mm^2	0.3 – 0.75				
Internal power consumption (5 V DC)		mA	330	370	340	390	380
Weight		kg	0.19	0.20	0.19	0.18	0.18
Dimensions (W x H x D)		mm	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90
Order information		Art. no.	127589	145037	127590	138325	138326

① Values are valid for all modules except for Q68DAI; ② Values are valid for all modules except for Q68DAV

Analog Modules for Temperature Measurement



Temperature measurement by thermocouple

These modules are designed to convert external platinum temperature-measuring resistor input values into16 or 32-bit signed binary temperature measurement values and scaling values.

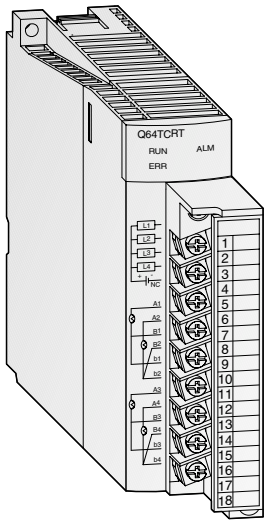
The reference temperature is determined by means of a Pt100 resistance thermometer for the Q64RD module (Q64RD-G additionally with Ni100 resistors) and by means of a thermocouple for the Q64TD and Q64TDV-GH modules.

Special features:

- Temperature of 4 channels can be measured by one module
- Two kinds of platinum temperature measuring resistors compliant with the JIS, IEC and DIN standards are supported.
- The disconnection of a platinum temperature-measuring resistor or cable can be detected on each channel
- Selection of sampling processing/time averaging processing/count averaging processing
- Error compensation by offset/gain value setting
- Alarm output when limit value is exceeded
- Potential isolation between process and control by means of an optocoupler is a standard feature. Additional potential isolation between the channels for Q64TDV-GH and Q64RD-G.
- Removable terminal block fastened with screws.

Specifications		Q64RD	Q64RD-G	Q64TD	Q64TDV-GH
Input channels		4	4	4	4
Connectable thermocouple	type	Pt100 (conforms to JIS C 1604-1989 and DIN IEC 751), JPt100 (conforms to JIS C 1604-1981)	Pt100 (conforms to JIS C 1604-1997 and DIN IEC 751-1983), JPt100 (conforms to JIS C 1604-1981), Ni100Ω (conf. to DIN 43760-1987)	K, E, J, T, B, R, S, N (conforms to JIS C1602-1995, IEC 584-1 and 584-2)	K, E, J, T, B, R, S, N (conforms to JIS C1602-1995, IEC 584-1 and 584-2)
Temperature measuring range		Pt100: -200 – 850 °C, JPt 100: -180 – 600 °C	Pt100: -200 – 850 °C, JPt 100: -180 – 600 °C, Ni100Ω: -60 – 180 °C	Depends on the thermocouple used	Depends on the thermocouple used
Temperature scaling value		16-bit, signed binary: -2.000 – +8.500 32-bit, signed binary: -200.000 – +850.000	16-bit, signed binary: -2.000 – +8.500 32-bit, signed binary: -200.000 – +850.000	16-bit, signed binary: -2.700 – +18.200 32-bit, signed binary: —	16-bit, signed binary: -25.000 – +25.000 32-bit, signed binary: —
Max. resolution	°C	0.025	0.025 °C	B, R, S, N: 0.3 °C; K, E, J, T: 0.1 °C	B: 0.7 °C; R, S: 0.8 °C, K, T: 0.3 °C; ET: 0.2 °C; J: 0.1 °C; N: 0.4 °C; Voltage: 4 µV
Cold junction temp. compensation accuracy		—	—	±1.0 °C	±1.0 °C
Overall accuracy		±0.08 % (accuracy relative to full-scale value) at ambient temperature 25 ± 5 °C	±0,04 % (accuracy relative to full-scale value) at ambient temperature 25 ± 5 °C	Depends on the thermocouple used	Depends on the thermocouple used
Max. conversion time		40 ms / channel	40 ms per channel	20 ms / channel	20 ms / channel
Analog inputs		4 channels/module	4 channels/module	4 channels/module + Pt100 connection	4 channels/module + Pt100 connection
Temp. measurement output current	mA	1	1	—	—
Insulation method		Transformer insulation between power supply and temperature inputs	Photocoupler isolation between each channel and PLC power. Transformer isolation between measuring input and channel	Transformator insulation between thermocouple inputs as well as thermocouple and earth	Transformer isolation between each channel and between the channels and PLC power
Disconnection detection		For each channel independent	For each channel independent	For each channel independent	For each channel independent
I/O points		16	16	16	16
Connection terminal		All modules are fitted with a removable terminal block with 18 screw terminals.			
Applicable wire size	mm^2	0.3 – 0.75	0.3 – 0.75	0.3 – 0.75	0.3 – 0.75
Internal power consumption (5 V DC)	mA	600	620	500	500
Weight	kg	0.17	0.20	0.25	0.25
Dimensions (W x H x D)	mm	27.4 x 98 x 90	27.4 x 98 x 112	27.4 x 98 x 90	27.4 x 98 x 90
Order information	Art. no.	137592	154749	137591	143544

Temperature Control Modules



Temperature control modules with PID algorithm

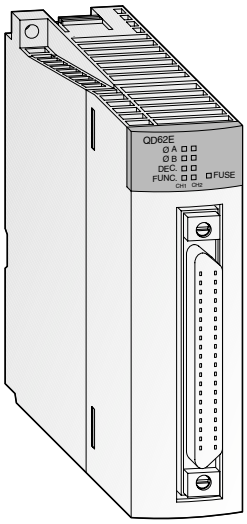
These modules enable PID algorithm temperature control without placing any load on the PLC CPU for the temperature control tasks.

Special features:

- Four temperature input channels
- Auto-tuning function for the 4 PID control circuits
- Temperature control can continue even when the PLC program is stopped
- Transistor output with pulse train to drive the actuator in the control circuit
- The module is provided with a removable terminal block fastened with screws.

Specifications		Q64TCRT	Q64TCRTBW	Q64TCTT	Q64TCTTBW
Control output	type	Transistor	Transistor	Transistor	Transistor
Inputs		4 channels per module	4 channels per module / broken wire detection	4 channels per module	4 channels per module / broken wire detection
Supported thermocouples		Pt100 (-200 – +600 °C), JPt100 (-200 – +500 °C)		R, K, J, T, S, B, E, N, U, L, P L II, W5Re/W26Re	
Sampling cycle		0.5 s / 4 channels	0.5 s / 4 channels	0.5 s / 4 channels	0.5 s / 4 channels
Control output cycle	s	1 – 100	1 – 100	1 – 100	1 – 100
Input filter		1 – 100 s (0 s: input filter OFF)	1 – 100 s (0 s: input filter OFF)	1 – 100 s (0 s: input filter OFF)	1 – 100 s (0 s: input filter OFF)
Temperature control method		PID ON/OFF impulse or 2-position control		PID ON/OFF impulse or 2-position control	
PID constant range	PID constant setting	Setting with automatic tuning possible		Setting with automatic tuning possible	
	proportional band P	0.0 – 1000 % (0 %: 2-position control)		0.0 – 1000 % (0 %: 2-position control)	
	integral constant I	1 – 3600 s	1 – 3600 s	1 – 3600 s	1 – 3600 s
	differential constant D	1 – 3600 s (0 setting for PID control)	1 – 3600 s (0 setting for PID control)	1 – 3600 s (0 setting for PID control)	1 – 3600 s (0 setting for PID control)
Target value setting range		Within the temperature range of the Pt100 sensor used		Within the temperature range of the thermocouple used	
Dead band setting range		0.1 – 10.0 %	0.1 – 10.0 %	0.1 – 10.0 %	0.1 – 10.0 %
Transistor output	output signal (sink)	ON/OFF pulse	ON/OFF pulse	ON/OFF pulse	ON/OFF pulse
	rated load voltage	10 – 30 V DC	10 – 30 V DC	10.2 – 30 V DC	10.2 – 30 V DC
	max. load current	0.1 A/1 point, 0.4 A/common	0.1 A/1 point, 0.4 A/common	0.1 A/1 point, 0.4 A/common	0.1 A/1 point, 0.4 A/common
	max. rush current	400 mA for 10 ms	400 mA for 10 ms	400 mA for 10 ms	400 mA for 10 ms
	max. voltage drop when ON	0.1 V DC (TYP) 0.1 A 2.5 V DC (MAX) 0.1 A	0.1 V DC (TYP) 0.1 A 2.5 V DC (MAX) 0.1 A	0.1 V DC (TYP) 0.1 A 2.5 V DC (MAX) 0.1 A	0.1 V DC (TYP) 0.1 A 2.5 V DC (MAX) 0.1 A
	response time	OFF → ON: < 2 ms ON → OFF: < 2 ms	OFF → ON: < 2 ms ON → OFF: < 2 ms	OFF → ON: < 2 ms ON → OFF: < 2 ms	OFF → ON: < 2 ms ON → OFF: < 2 ms
Insulation method		Transformer	Transformer	Transformer	Transformer
I/O points		16 / 1 slot	32 / 2 slots	16 / 1 slot	32 / 2 slots
Connection terminals		All modules are fitted with a terminal block with 18 screw terminals.			
Applicable wire size	mm^2	0.3 – 0.75	0.3 – 0.75	0.3 – 0.75	0.3 – 0.75
Internal power consumption (5 V DC)	mA	550	60	550	640
Weight	kg	0.2	0.3	0.2	0.3
Dimensions (W x H x D)	mm	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90
Order information	Art. no.	136386	136387	136388	136389

■ High-Speed Counter Modules



High-speed counter with automatic detection of rotation direction

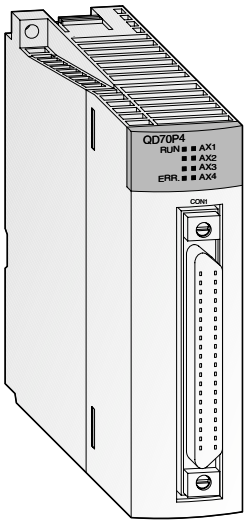
These counter modules detect signals with a frequency which cannot be detected by normal input modules. For example, simple positioning tasks or frequency measurements can be realized.

Special features:

- Input for incremental shaft encoder with automatic forward and reverse detection
- Preset count via external signals or the PLC program with the aid of the PRESET function
- Ring counter function for counting up to a predefined value with automatic resetting to the starting value
- Functions such as speed measurement, definition of switching points or periodic counting are available.
- The modules QD62☐ are provided with a 40-pin connector interface (for suitable connectors, please refer to the chapter "Accessories").
- The module QD60P8-G is provided with a removable terminal block fastened with screws.

Specifications			QD62E	QD62	QD62D	QD60P8-G
Counter inputs			2	2	2	8
Signal levels			5 / 12 / 24 V DC (2 – 5 mA)	5 / 12 / 24 V DC (2 – 5 mA)	5 / 12 / 24 V DC (2 – 5 mA) (RS422A)	5 / 12 / 24 V DC
Max. counting frequency		kHz	200	200	500 (differential)	30
Max. counting speed	1-phase-input	kHz	200 or 100	200 or 100	500 or 200	30
	2-phase-input	kHz	200 or 100	200 or 100	500 or 200	—
Counting range			32 bits + sign (binary), -2147483648 – +2147483647	32 bits + sign (binary), -2147483648 – +2147483647	32 bits + sign (binary), -2147483648 – +2147483647	16 bits binary: 0 – 32767 32 bit binary: 0 – 99999999 32 bit binary: 0 – 2147483647
Counter type			All modules are equipped with UP/DOWN preset counter and ring counter function.			Moving average function, alarm output and pre-scale function
Comparison range			32 bits + sign (binary)	32 bits + sign (binary)	32 bits + sign (binary)	32 bits + sign (binary)
External digital input points			Preset, function start	Preset, function start	Preset, function start	Preset, function start
Rated voltage/current for external input			5 / 12 / 24 V DC (2 – 5 mA)	5 / 12 / 24 V DC (2 – 5 mA)	5 / 12 / 24 V DC (2 – 5 mA) (RS422A)	5 / 12 / 24 V DC
External digital output points (coincidence signal)			2 points/channel 12 / 24 V DC 0.1 A/point, 0.4 A/common (source)	2 points/channel 12 / 24 V DC 0.5 A/point, 2.0 A/common (sink)	2 points/channel 12 / 24 V DC 0.5 A/point, 2.0 A/common (sink)	—
I/O points			16	16	16	32
Connection terminal			40-pin connector interface on the front	40-pin connector interface on the front	40-pin connector interface on the front	Terminal block with 18 screw terminals
Applicable wire size		mm^2	0.3	0.3	0.3	0.3 – 0.75
Internal power consumption (5 V DC)		mA	330	300	380	580
Weight		kg	0.12	0.11	0.12	0.17
Dimensions (W x H x D)		mm	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90
Order information		Art. no.	128949	132579	132580	145038
Accessories			40-pin connector and ready to use connection cables and system terminals (refer to page 35–37)			

■ Positioning Modules



Multi-axis positioning

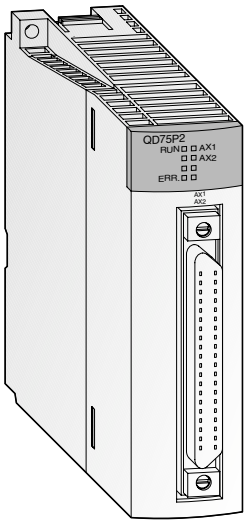
The modules are especially designed for systems including multiple axes that do not require any extensive control. The QD70P4 controls up to 4 axes and the QD70P8 up to 8 axes. Since any number of positioning modules can be used the number of axes to be controlled as well is unlimited.

Special features:

- Control of 4 or 8 axes by one module and more than 8 axes by using multiple modules
- Quick start of up to 8 axes simultaneously (0.1 ms per axis after start command from the CPU)
- Various positioning control systems are selectable.
- Easy parametrizing and positional data setup via optionally available positioning software GX Configurator-PT

Specifications			QD70P4	QD70P8
Number of control axes			4	8
Interpolation			—	
Points per axis			10 (by PLC program or with the positioning software GX Configurator PT)	
Output signal			Pulse chain	
Output frequency		kHz	1 – 200 000	
Positioning method			PTP positioning; speed/locus positioning; path control	
Positioning	units		Absolute data: -2 147 483 648 – 2 147 483 647 pulse Incremental method: -2 147 483 648 – 2 147 483 647 pulse Speed/position switching control: 0 – 2 147 483 647 pulse	
	speed		0 – 200 000 pulse/s	
	acceleration/deceleration processing		Automatic, acceleration and deceleration step by step	
	acceleration and deceleration time		0 – 32767 ms	
Pulse output type			Open collector output	
Max. servo motor cable length		m	2	2
I/O points			32	32
Applicable wire size			0.3 mm² (with connector A6CON1); AWG24 (with connector A6CON2)	
Internal power consumption (5 V DC)		mA	550	740
External power consumption (24 V DC)		mA	65	120
Weight		kg	0.15	0.17
Dimensions (W x H x D)		mm	27.4 x 98 x 90	27.4 x 98 x 90
Order information		Art. no.	138328	138329
Accessories			40-pin connector and ready to use connection cables and system terminals (refer to page 35–37)	

■ Positioning Modules



Positioning with an open control loop

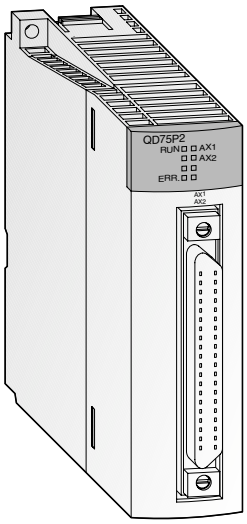
The modules generate the travel command via a pulse chain. The speed is proportional to the pulse frequency and the distance travelled is proportional to the pulse length.

Special features:

- Control of up to three axes with linear interpolation (QD75P4) or circular interpolation (QD75P2, QD75P4)
- Storage of up to 600 positional data in the flash ROM (no back-up battery necessary)
- Units of travel can be defined in pulses, mm, inches or degrees.
- Configuration and presetting of all 600 positional data is performed via the PLC program or with the aid of the programming software GX Configurator QP. This software runs under Windows 95/98 and Windows 2000/NT.

Specifications		QD75P1	QD75P2	QD75P4
Number of control axes		1	2	4
Interpolation		—	2 axis linear and circular interpolation	2, 3, or 4 axis linear and 2 axis circular interpolation
Points per axis		600 pieces of data with PLC program, 100 pieces of data with GX Configurator QP		
Output type		Open collector	Open collector	Open collector
Output signal		Pulse chain	Pulse chain	Pulse chain
Output frequency	kHz	1 – 200	1–200	1–200
Positioning	method	PTP control: absolute data and/or incremental; speed/position swiching control: incremental; locus/speed control: incremental; path control: absolute data and/or incremental		
	units	Absolute data: -2 147 483 648 – 2 147 483 647 pulse -21 4748 364,8 – 214 748 364.7 µm -21 474.83648 – 21 474.83647 inch 0 – 359.99999 degree Incremental method: -2 147 483 648 – 2 147 483 647 pulse -214 748 364,8 – 214 748 364,7 µm -21 474.83648 – 21 474.83647 inch -21 474.83648 – 21 474.83647 degree Speed/position switching control: 0 – 2 147 483 647 pulse 0 – 21 4748 364.7 µm 0 – 21 474.83647 inch 0 – 21 474.83647 degree		
	speed	1 – 1 000 000 pulse/s 0.01 – 20 000 000.00 mm/min 0.001 – 200 000.000 degree/min 0.001 – 200 000.000 inch/min		
	acceleration/deceleration processing	Automatic trapezoidal or S-pattern acceleration and deceleration or automatic S-pattern acceleration and deceleration		
	acceleration and deceleration time	1 – 8388608 ms (4 patterns each can be set)		
	rapid stop decceleration time	1 – 8388608 ms		
Max. length for servo motor cable	m	2	2	2
I/O points		32	32	32
Internal power consumption (5 V DC)	mA	400	460	580
Weight	kg	0.15	0.15	0.16
Dimensions (W x H x D)	mm	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90
Order information	Art. no.	132581	132582	132583
Accessories		40-pin connector and ready to use connection cables and system terminals (refer to page 35–37); Programming software: GX Configurator QP, art. no.: 132219		

■ Positioning Modules



Long distance positioning

The modules QD75D1, QD75D2, and QD75D4 are suitable for bridging long distances between module and drive system. The modules provide differential outputs that allow large motor cable lengths.

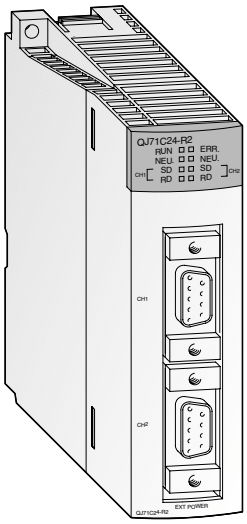
QD75D1, QD75D2, and QD75D4 are designed for the operation across the motion network SSCNET.

Special features:

- Control of up to four axes with linear interpolation (QD75D4/QD75M4) or two axes circular interpolation (QD75D2/QD75M2, QD75D4/QD75M4)
- Storage of up to 600 positional data in the flash ROM (no back-up battery necessary)
- Units of travel can be defined in pulses, mm, inches or degrees.
- Configuration and presetting of all 600 positional data is performed via the PLC program or with the aid of the programming software GX Configurator QP. This software runs under Windows 95/98 and Windows 2000/NT.

Specifications			QD75D1	QD75M1	QD75D2	QD75M2	QD75D4	QD75M4
Number of control axes			1	1	2	2	4	4
Interpolation			—	—	2 axis linear and circular interpolation		2, 3, or 4 axis linear and 2 axis circular interpolation	
Points per axis			600 pieces of data with PLC program, 100 pieces of data with GX Configurator QP					
Output type			Differential driver	SSCNET	Differential driver	SSCNET	Differential driver	SSCNET
Output signal			Pulse chain	BUS	Pulse chain	BUS	Pulse chain	BUS
Output frequency		kHz	1 – 1000	1 – 1000	1 – 1000	1 – 1000	1 – 1000	1 – 1000
Positioning	method		PTP control: absolute data and/or incremental; speed/position swiching control: incremental; locus/speed control: incremental; path control: absolute data and/or incremental					
	units		Absolute data: -2 147 483 648 – 2 147 483 647 pulse; -21 4748 364.8 – 214 748 364.7 µm; -21 474.83648 – 21 474.83647 inch; 0 – 359.99999 degree Incremental method: -2 147 483 648 – 2 147 483 647 pulse; -214 748 364.8 – 214 748 364,7 µm; -21 474.83648 – 21 474.83647 inch; -21 474.83648 – 21 474.83647 degree Speed/position switching control: 0 – 2 147 483 647 pulse; 0 – 21 4748 364.7 µm; 0 – 21 474.83647 inch; 0 – 21 474.83647 degree				
	speed		1 – 1 000 000 pulse/s 0.01 – 20 000 000.00 mm/min 0.001 – 200 000.000 degree/min 0.001 – 200 000.000 inch/min					
	acceleration/deceleration processing		Automatic trapezoidal or S-pattern acceleration and deceleration or automatic S-pattern acceleration and deceleration					
	acceleration and deceleration time		1 – 8388608 ms (4 patterns, each can be set)					
	rapid stop decceleration time		1 – 8388608 ms					
Max. length for servo motor cable		m	10	30	10	30	10	30
I/O points			32	32	32	32	32	32
Internal power consumption (5 V DC)		mA	520	520	560	560	820	820
Weight		kg	0.15	0.15	0.15	0.15	0.16	0.16
Dimensions (W x H x D)		mm	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90
Order information		Art. no.	129675	142153	129676	142154	129677	142155
Accessories			40-pin connector and ready to use connection cables and system terminals (refer to page 35–37); Programming software: GX Configurator QP, art. no.: 132219					

Interface Modules



Data exchange with peripheral devices

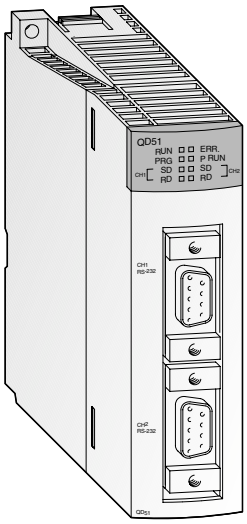
This module enables communication with peripheral devices via a standard RS232 interface. The peripherals are connected point-to-point on a 1:1 basis.

Special features:

- The QJ71C24N provides one RS232 and one RS422/485 interface. The QJ71C24-R2 provides two RS232 interfaces and the QJ71C24N-R4 two RS422/485 interfaces.
- Enables PCs connected to the system to access the full data set of the MELSEC Q CPU using graphic process supervision or monitoring software
- Support for plain ASCII data exchange with connected devices such as barcode readers, scales and identification systems
- Integrated flash ROM memory for logging quality, productivity or alarm data that can be printed out when required
- Module and communications status shown by LEDs
- Communications test and monitor function are possible with the software GX-Configurator UT

Specifications			QJ71C24N	QJ71C24N-R2	QJ71C24N-R4
Interface		channel 1	RS232 (9-pin Sub-D)	RS232 (9-pin Sub-D)	RS422 / RS485 (screw terminals)
		channel 2	RS422 / RS485 (screw terminals)	RS232 (9-pin Sub-D)	RS422 / RS485 (screw terminals)
Communications mode			Full duplex / half duplex	Full duplex / half duplex	Full duplex / half duplex
Synchronisation			Asynchronous communications	Asynchronous communications	Asynchronous communications
Data transfer	rate	Bit/s	50 – 230400 (channel 1 only) 115200 (channel 1+2 simultaneously)	50 – 230400 (nur Kanal 1) 115200 (channel 1+2 simultaneously)	50 – 230400 (channel 1 only) 115200 (channel 1+2 simultaneously)
	distance RS232	m	15	15	—
	distance RS422/485	m	1200 (if both channels are used)	—	1200 (if both channels are used)
Max. no of stations in a multidrop network			no restrictions / 64	—	no restrictions / 64
Data format			1 start bit, 7 or 8 data bits, 1 or 0 parity bits, 1 or 2 stop bits	1 start bit, 7 or 8 data bits, 1 or 0 parity bits, 1 or 2 stop bits	1 start bit, 7 or 8 data bits, 1 or 0 parity bits, 1 or 2 stop bits
Error correction			Parity check, checksum	Parity check, checksum	Parity check, checksum
DTR/DSR control			YES / NO selectable	YES / NO selectable	—
X ON / X OFF (DC1 / DC3)			YES / NO selectable	YES / NO selectable	YES / NO selectable
I/O points			32	32	32
Internal power consumption (5 V DC)		mA	310	260	390
Weight		kg	0.2	0.2	0.2
Dimensions (W x H x D)		mm	27.4 x 98 x 90	27.4 x 98 x 90	27.4 x 98 x 90
Order information		Art. no.	149500	149501	149502

■ High-Speed Communication Modules



Programmable interface module

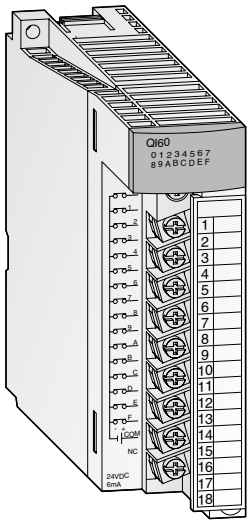
This module works through its own program independently of the PLC CPU. Thus, peripherals can be operated or mathematical operations performed without imposing an additional load on the PLC CPU. Programming is in AD51H-BASIC.

Special features:

- Two RS232C interfaces and one RS422/485 interface
- Two BASIC programs can be operated in parallel (multitasking).
- The tasks can be stored in the module as interpreter programs or in compiled form.
- The integrated Flash ROM is used for storage.
- Online and offline program creation is possible.
- The module and communication status is indicated by means of LEDs.

Specifications			QD51-R24	QD51
Interfaces		type	1 x RS422/485, 1 x RS232	2 x RS232
Microprocessor		type	V53A (20 MHz)	V53A (20 MHz)
Number of parallel tasks			Max. 2	Max. 2
Start conditions for tasks			Started by power on, started by the start command from another task, start by an interruption from the PC CPU.	
Data transfer	rate	bit/s	≤ 38 400	≤ 38 400
	distance	m	500 (RS422/485), 15 (RS232C)	15 (RS232C)
Program language			AD51H-BASIC	AD51H-BASIC
Internal memory	program memory	kbyte	64 x 1 task or 32 x 2 tasks	64 x 1 task or 32 x 2 tasks
	common memory for tasks	kbyte	8	8
	data buffer to PLC	kbyte	6	6
	extension relays		1024	1024
	extension data registers		1024 (2 kbyte)	1024 (2 kbyte)
Memory backup capability			Provided for common memory, extension relay and extension register.	Provided for common memory, extension relay and extension register.
Memory for programs			Flash memory: 64 kbyte	Flash memory: 64 kbyte
I/O points			32 (1 slot)	32 (1 slot)
Internal power consumption (5 V DC)		mA	310	260
Weight		kg	0.2	0.2
Dimensions (W x H x D)		mm	27.4 x 98 x 90	27.4 x 98 x 90
Order information		Art. no.	136385	136384
Accessories			For both modules: programming software for PC/AT (MS-DOS): SW1IX-AD51HPE, art. no.: 33102	

Interrupt Module



Branching to subroutines

The interrupt module QI60 is suitable for applications demanding quick responses.

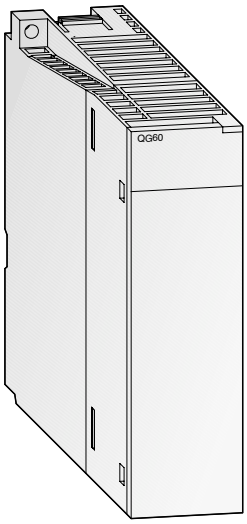
Special features:

- Every input in this module is assigned to a pointer which serves as a branch mark for a subroutine.
- If an interrupt/alarm signal is applied at an input, the PLC program is interrupted after it has worked through the current statement and a subroutine assigned to the input is first processed.
- Galvanic isolation between process and controller by means of a photocoupler is a standard feature
- Only one QI60 can be installed per PLC system

Specifications			QI60
Input points			16
Rated input voltage		V DC	24 (sink type)
Operating voltage range		V DC	24
Max. input points simultaneous ON			100 %
Input	resistance	kΩ	ca. 3.9
	current	mA	ca. DC 4 / 8
ON	voltage	V	≥ DC 19
	current	mA	≥ DC 4
OFF	voltage	V	≤ DC 11
	current	mA	≤ DC 1.7
Response time	OFF ⟶ ON	ms	≤ 0.2
	ON ⟶ OFF	ms	≤ 0.3
Status display of inputs			LED
Insulation method			All modules are fitted with photocoupler isolation between input terminals and internal circuit.
No. of occupied I/O points			16
Connection terminal			The module is fitted with a terminal block with 18 screw terminals.
Applicable wire size		mm^2	0.3 – 0.75
Internal power consumption (5 V DC)		mA	60 (all points ON)
Weight		kg	0.20
Dimensions (W x H x D)		mm	27.4 x 98 x 90

Order information	Art. no.	136395

Dummy Module



Place keeper and mechanical protection

The dummy module QG60 protects unused slots on the base unit from dust and reserve I/O addresses.

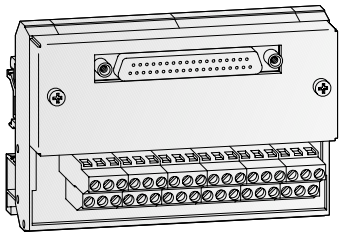
Special features:

- Tough protection of unused slot
- Unified front view

Specifications		QG60
I/O points		0 – 1024 (selectable)
Application		Used to protect any vacant slot from dust.
Current consumption	mA	—
Weight	kg	0.07
Dimensions (W x H x D)	mm	27.4 x 98 x 90

Order information	Art. no.	129853

System Terminals



Transfer modules for simplified system cabling

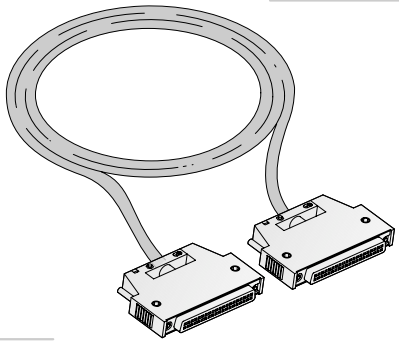
The system terminals are transfer modules for simplified cabling and to supplement the performance of the modules. In particular, these terminals permit a far higher output current through the addition of a transistor, relay or triac. Furthermore there are also terminals with built-in serial diodes for parallel switching available.

For easy cabling the system terminals ST16-3 and ST32-3 have connection rows for voltage terminals (24 V / 0 V).

With the aid of prefabricated, screened cables that can also be supplied (see below), this connection concept provides independence from the output module connector technology and various special function modules.

Specification		ST32	ST32-DIOD	ST32-3	ST40	ST16-3	ST16-SOCKET
Operation range		Input/output modules	Output modules	Input/output modules	Special function modules	Input/output modules	Output modules
Channels		32	32	32	40	16	16
Design		Plain	Serial diode integrated	3 terminal rows with voltage terminals	Plain	3 terminal rows with voltage terminals	Sockets for relay, transistor or triac
Application		All I/O modules with type 37 D-Sub connector	All output modules with type 37 D-Sub connector	All I/O modules with type 37 D-Sub connector	QD62E, QD62D, special function modules with 40-pin connector	All I/O modules with screw terminals	All output modules with type 37 D-Sub connector
Dimensions (W x H x D)	mm	112.5 x 77 x 62	112.5 x 77 x 62	180 x 77 x 75	112.5 x 77 x 60	112.5 x 77 x 75	180 x 77 x 56
Order information	Art. no.	146888	146890	146891	146893	146894	146895
Accessories		Plug relay 6 A (16 pcs.) ST16-RELAY-6A for ST16-SOCKET; art. no.: 146897 Plug transistor 2 A (16 pcs.) ST16-TRANSISTOR-2A for ST16-SOCKET; art. no.: 146899 Plug triacs 1 A (16 pcs.) ST16-TRIAC-1A for ST16-SOCKET; art. no.: 146900 Jumper cable ST-JUMPER to bridge 16 terminal screws; art. no.: 146915					

Connection Cables



Connection cables for system terminals

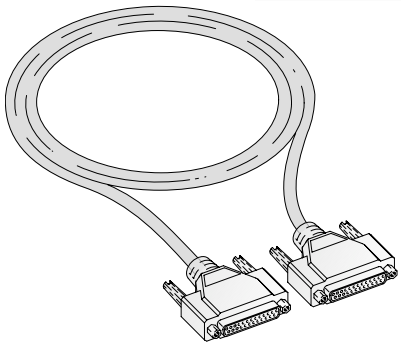
The connection cables are for the connection of the system terminals to the input/output or special function modules of the MELSEC range. Thanks to the different lengths that are available, the correct cable can be selected for every application.

The connection cables Q16ST-CAB□□M are additionally equipped with an exchange block for changing to spring clamp terminals instead of the screw terminal block.

Specifications		Q16-ST-CAB-06M	Q16-ST-CAB-15M	Q16-ST-CAB-30M	Q32-ST-CAB03M	Q32-ST-CAB06M	Q32-ST-CAB15M	Q32-ST-CAB30M	Q40-ST40-CAB-06M	Q40-ST40-CAB-15M	Q40-ST40-CAB-30M	QD62E-CAB-06M	QD62E-CAB-15M	QD62E-CAB-30M
Operation range (system terminal)		ST16	ST16	ST16	ST16/ST32	ST16/ST32	ST16/ST32	ST16/ST32	ST40	ST40	ST40	ST40	ST40	ST40
Application		All I/O modules with screw terminal connection*			All I/O modules with type 37 D-Sub connector				All modules with 40-pin connector			For QD62E		
Length	m	0.6	1.5	3.0	0.3	0.6	1.5	3.0	0.6	1.5	3.0	0.6	1.5	3.0
Order information	Art. no.	146902	146903	146904	146905	146906	146907	146908	146909	146910	146911	146912	146913	146914

*for exchange of the standard terminal block against a spring clamp terminal block

Connection Cables



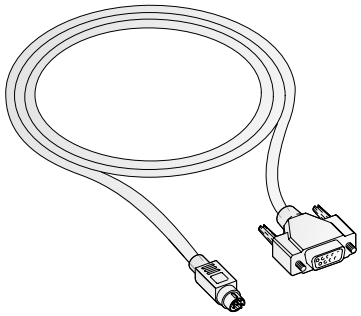
Connection cable for extension units

These connection cables are used for connecting base units to the extension units. They have been cut to the correct length for each application.

When the extension cables are used multiple, the overall distance of the cables should be within 13.2 m.

Specifications		QC05B	QC06B	QC12B	QC30B	QC50B	QC100B
For extension base units		Q52B, Q55B	Q63B, Q65B, Q68B, Q612B	Q63B, Q65B, Q68B, Q612B	Q63B, Q65B, Q68B, Q612B	Q63B, Q65B, Q68B, Q612B	Q63B, Q65B, Q68B, Q612B
Length	m	0.45	0.6	1.2	3.0	5.0	10.0
Order information	Art. no.	140380	129591	129642	129643	129644	129645

Programming Cable



Programming cable for USB and RS232 interface

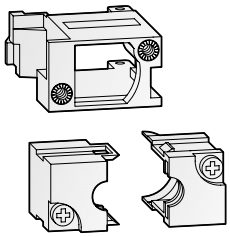
The programming cables QC30R2 and QC30-USB are used for programming a MELSEC system Q CPU via the RS232 or USB interface.

The programming cable provides a 9-pin D-sub connector for the PC side and a 6-pin Mini-DIN connector for the PLC interface.

The USB cable is especially suited for a fast connection between PC and CPU.

Specifications		QC30R2	QC30-USB
Connection cable for		Connection between a PCs and a MELSEC system Q PLC via RS232 interface	Connection between a PCs and a MELSEC system Q PLC via USB interface
Length	m	3.0	3.0
Order information	Art. no.	128424	136577
Accessories		Connector disconnection prevention holder Q6HLD-R2	

Connector Disconnection Prevention Holder

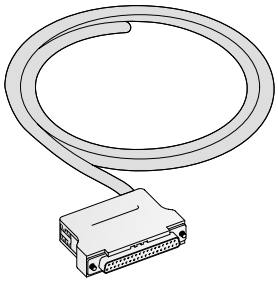


Disconnection prevention for RS232 cable

The connector disconnection prevention holder Q6HLD-R2 securely locks the RS232 connector of the programming cable to the CPU and prevents the connector from accidentally loosening (e.g. when connected to an HMI operator terminal).

Specifications		Q6HLD-R2
Application		Programming cable QC30R2
Order information	Art. no.	140381

Adapter Cables

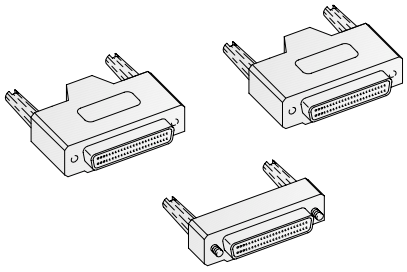


Assembled cable with D-SUB plug

The cables Q32CBL-3m and Q32CBL-5M are used for connecting the modules QX81 and QY81P of the MELSEC Q.

Specifications		Q32CBL-3M	Q32CBL-5M
Connection cable for	type	QX81/QY81P	QX81/QY81P
Length	m	3.0	5.0
Order information	Art. no.	136575	136576

40-Pin Connectors



Connectors A6CON

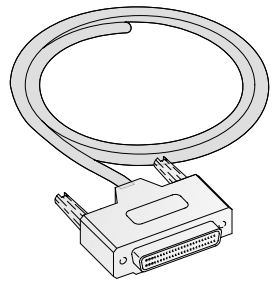
The 40-pin connectors are available in four different connection versions that differ in the way the leads are connected.

These connectors are required for all modules that connect to external signals via a 40-pin plug connection.

Whilst for the connectors A6CON-1 to A6CON-3 the cable is attached straight into the connector, in the case of the A6CON-4 the lead is angled.

Specifications		A6CON-1	A6CON-2	A6CON-3	A6CON-4
Connector		Soldering type	Crimp-contact type	Pressure displace-ment type	Soldering type
Applicable wire size	mm²	0.3	0.3	0.3	0.3
Order information	Art. no	134139	134140	134141	146923

Connection Cables with Connectors



Assembled cables

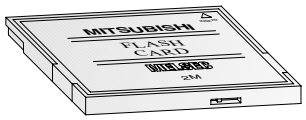
The cables Q40CBL-3M and Q40CBL-5M serve as connecting cables for I/O modules with 40-pin plug connection.

The cables are prefabricated, i.e. a 40-pin connector is already attached to one cable end.

The cables FA-CBLQ75M☐☐ are ready made cables for the connection of the positioning modules QD75D1/D2/D4 or QD75P1/P2/P4 to a Mitsubishi servo amplifier MR-J2-Super or MR-C .

Specifications		Q40CBL-3M	Q40CBL-5M	FA-CBLQ75M2J2-P	FA-CBLQ75M2C-P	FA-CBLQ75PM2J2	FA-CBLQ75PM2C
Application range		All System Q modules with 40-pin connectors, like e.g. QX71, QX72, QY41P, QY42P		QD75D1/D2/D4 for connection with MELSERVO MR-J2-S	QD75D1/D2/D4 for connection with MELSERVO MR-C	QD75P1/P2/P4 for connection with MELSERVO MR-J2-S	QD75P1/P2/P4 for connection with MELSERVO MR-C
Specifications	m	3.0	5.0	2.0	2.0	2.0	2.0
Order information	Art. no.	140991	140997	147697	147698	147699	147700

Memory Cards

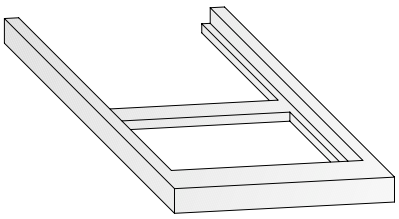


MELSEC System Q memory cards

All System Q CPUs have a permanently installed RAM. This memory can be extended with a variety of external memory cards.

Specifications		Q2MEM-1MBS	Q2MEM-2MBS	Q2MEM-2MBF	Q2MEM-4MBF	Q2MEM-8MBA	Q2MEM-16MBA	Q2MEM-32MBA
Memory	type	SRAM card	SRAM card	Flash card	Flash card	ATA card	ATA card	ATA card
Memory capacity		1 MB	2 MB	2 MB	4 MB	8 MB	16 MB	32 MB
Order information	Art. no.	127627	145399	127591	129646	129647	129648	129649

PCMCIA Adapter Unit

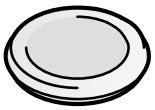


Memory card adapter

The memory card adapter Q2MEM-ADP is used for the PCMCIA slot of the PLC for data transferring.

Specifications		Q2MEM-ADP
For memory cards	type	All MELSEC Q memory cards
Order information	Art. no.	129650

Battery Q2MEM-BAT

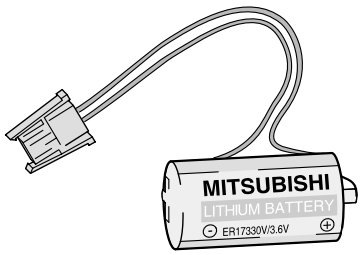


Memory card buffer battery

The lithium battery Q2MEM-BAT is a replacement battery for the SRAM memory card Q2MEM-1MBS.

Specifications		Q2MEM-BAT
For memory card	type	Q2MEM-1MBS and Q2MEM-2MBS
Voltage	V DC	3.0
Capacity	mAh	48
Order information	Art. no.	129854

Battery Q6BAT

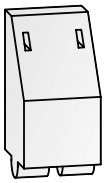


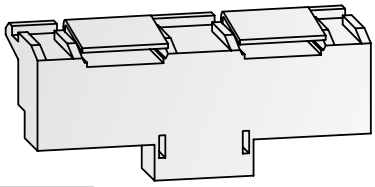
Buffer battery

The lithium battery Q6BAT is the replacement for the battery integrated for data backup in any MELSEC System Q CPU.

Specifications		A6BAT
Voltage	V DC	3,0
Capacity	mAh	1800
Dimensions (Ø x H)	mm	Ø16 x 30
Order information	Art. no	130376

DIN Rail Mounting Adapter



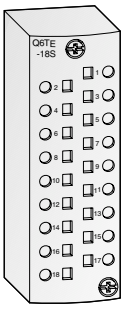


Adapter for mounting a MELSEC System Q on a DIN rail

The mounting adapter is used for easy and quick mounting the MELSEC Q base units on a DIN rail.

Specifications		Q6DIN1	Q6DIN2	Q6DIN3
For base units		Q38B/Q312B/Q68B/Q612B	Q35B/Q65B	Q33B/Q63B
Dimensions (W x H x D)	mm	328 x 98	245 x 98	198 x 98
Order information	Art. no	129673	129674	136368

Interchangeable Terminal Blocks for I/O Modules



Terminal blocks for screw-less wiring

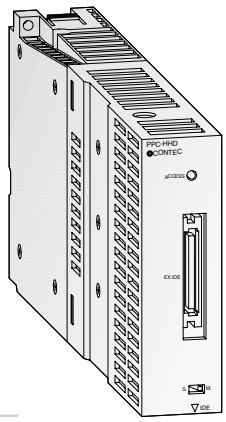
As an alternative to the standard screw terminal blocks for the input/output modules, there are two different screw-less terminal blocks available.

The spring clamp terminal block Q6TE-18S permits the connection of single or multiple-wire copper conductors, whereby the stripped cable ends are pressed vertically into the terminal and are held by a traction spring.

In the case of the Q6TA32 terminal block, contact is made by pressing in the wire with the optional insertion tool without having to strip the wire first. This allows for rapid wiring of the terminals.

Specifications		Q6TE-18S	Q6TA32
Type		Spring clamp terminal block	IDC terminal block adapter
Applicable modules		All System Q modules with terminal block for 18 screw terminals	QX41, QX71, QY41P, QY71
Applicable wire size	mm^2	0.3 – 1.5	0.5
Weight	kg	0.07	0.08
Order information	Art. no.	141646	145034
Accessory		—	Insertion tool Q6TA32TOL, art. no.: 145035

Disk Drives for Q-PC



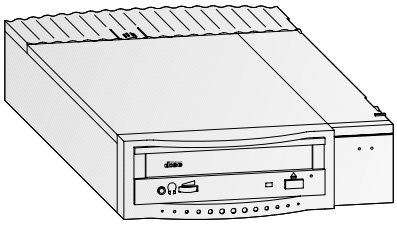
Memory units

8 different disk drives are available for the Q-PC that can be inserted additionally into the base unit directly beside the CPU module. The connection to the CPU is established via a short cable link underneath the modules.

Besides a conventional hard disk with a storage capacity of 5 GB a number of so called silicon disks for the use under ambient conditions subject to strong vibrations or shocks is available.

Specifications	PPC-HDD (MS)-5	PPC-SDD (MS)-1000	PPC-SDD (MS)-500	PPC-SDD (MS)-320	PPC-SDD (MS)-192	PPC-SDD (MS)-128	PPC-SDD (MS)-64	PPC-SDD (MS)-32
Type	Hard disk	Silicon disk	Silicon disk	Silicon disk	Silicon disk	Silicon disk	Silicon disk	Silicon disk
Memory capacity	20 GB	1024 MB	512 MB	320 MB	192 MB	128 MB	64 MB	32 MB
Order information Art. no.	140109	139818	140110	140111	140122	140123	140124	140125
Accessories	Hard disk vibration protection PPC-HBR-01; art. no.: 140126							

External Drives for Q-PC



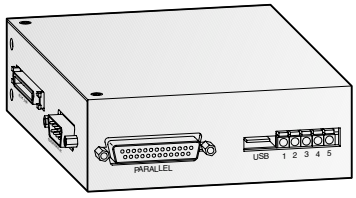
Disk drives

For the Q-PC a special external floppy disk drive and a special CD-ROM drive are available.

The drives provide their own casing and are connected to the Q-PC via cable.

Specifications	PPC-FDD25BH	PPC-CDD-01
Type	Floppy disk drive	CD-ROM drive
Description	3,5-inch external drive incl. cable	External IDE drive
Order information Art. no.	140128	139821

Extension Device Box



Extension by additional interfaces

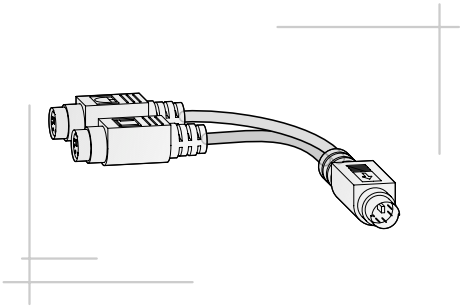
Each extension device box extends the PC-CPU by one RS232, one USB, and one parallel interface.

Furthermore, additional potential free remote contacts are included which support e.g. the polling of the watchdog timer or a remote shutdown.

The extension device box is connected to the "EX I/F" connector on the front panel of the CPU module.

Specifications	PPC-COT-01	PPC-DINAD-01
Type	Interface extension box	DIN-rail mounting adapter for the extension device box
Interface	1 x RS232, 1 x USB, 1 x parallel	
Order information Art. no.	139819	140127

Cable and Adapter

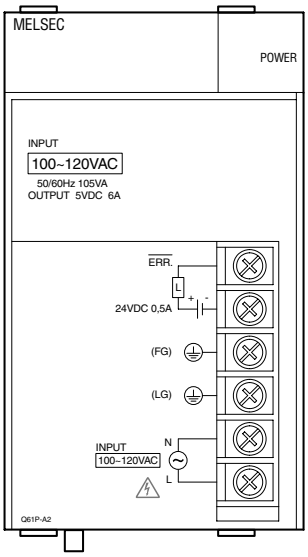


If both, mouse and keyboard are intended to be connected at the same time, the Y-adapter PPC-YCAB-01 is required.

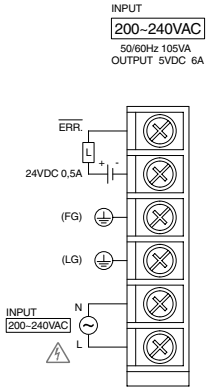
The cable PPC-SCC-01 extends the Q-PC by one serial interface.

Specifications	PPC-YCAB-01	PPC-SCC-01
Type	Mouse and keyboard cable	Cable for 2nd serial interface
Design	PS/2 Y cable	EX/IF connection to 9-pin D-Sub
Order information Art. no.	140484	139820

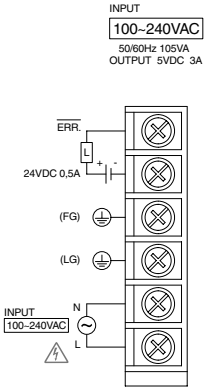
■ Power Supply Modules



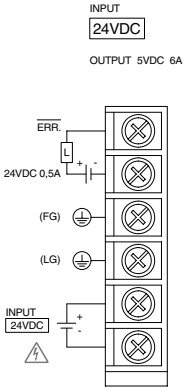
Q61P-A1



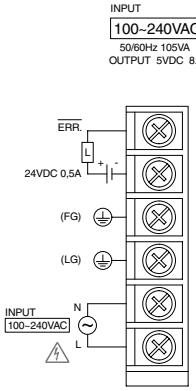
Q61P-A2



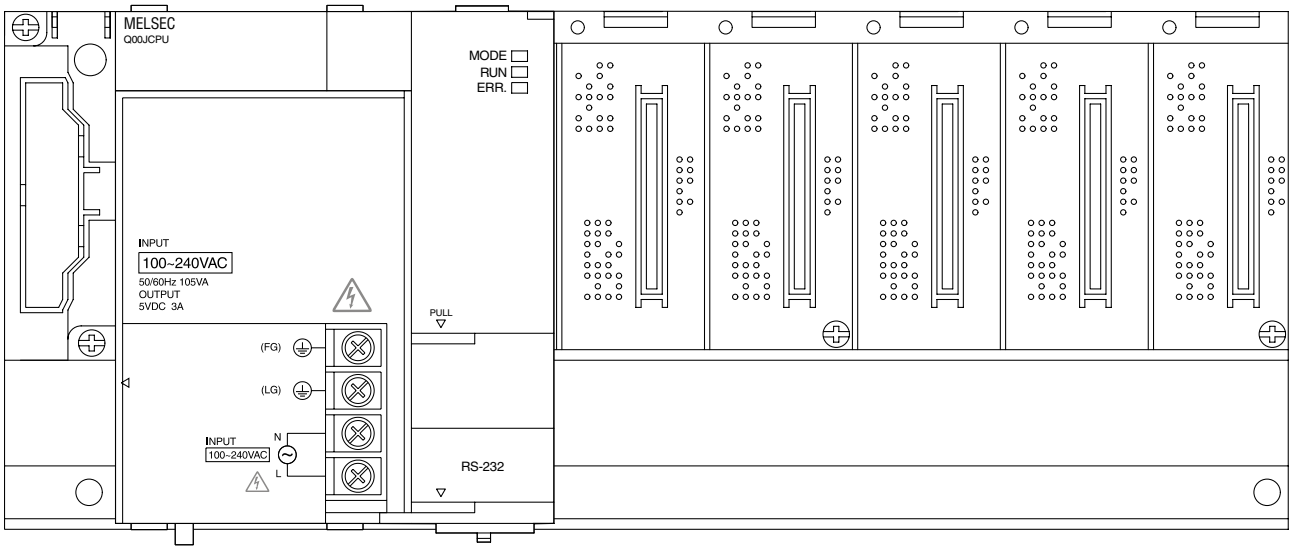
Q62P



Q63P

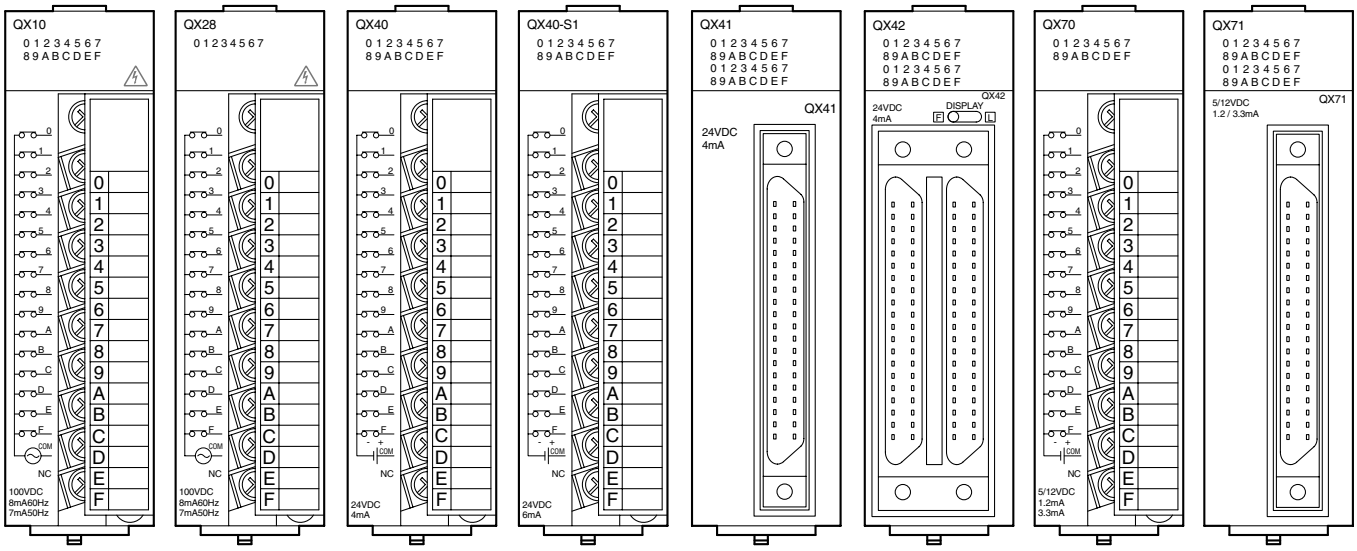


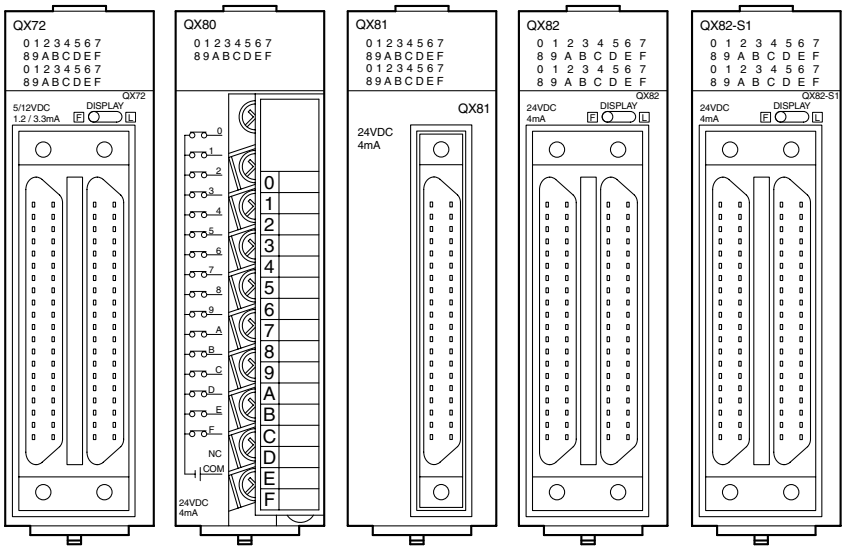
Q64P

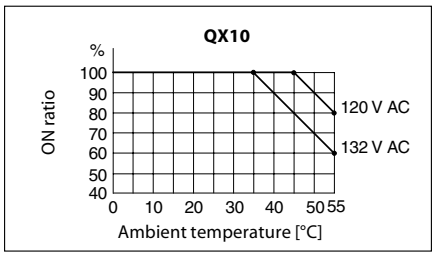


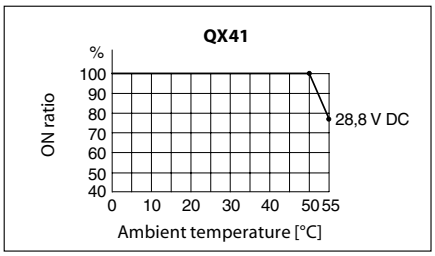
Q00JCPU

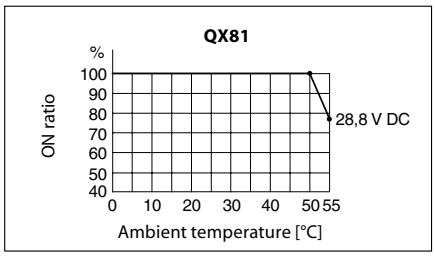
■ Digital Input Modules

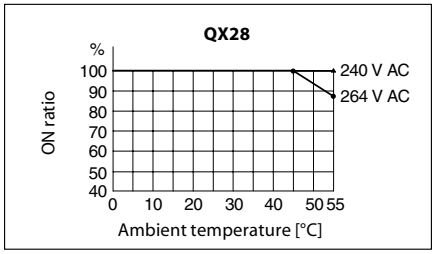


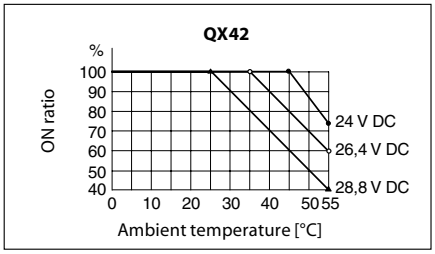


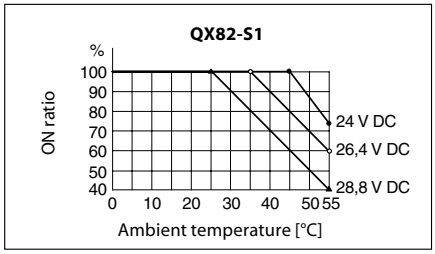




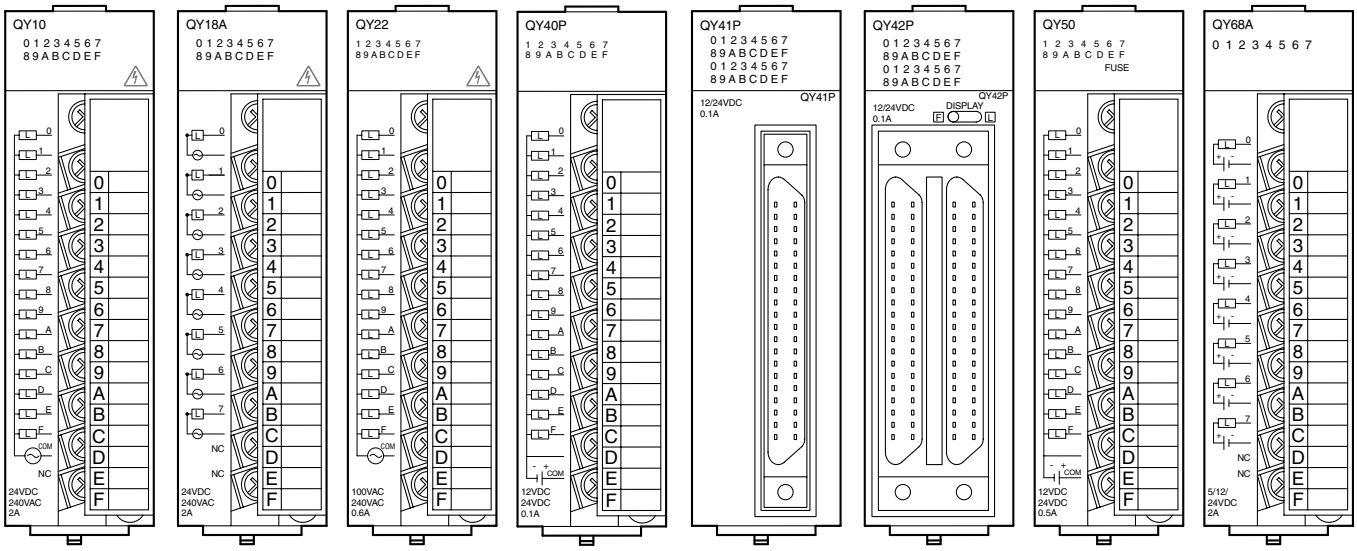


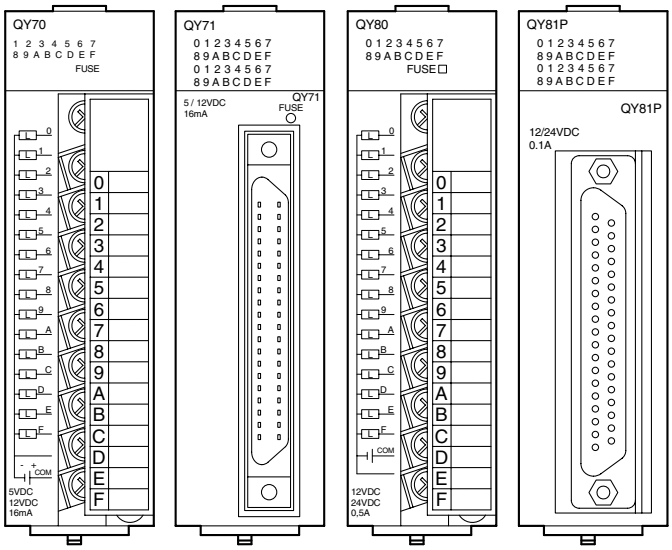




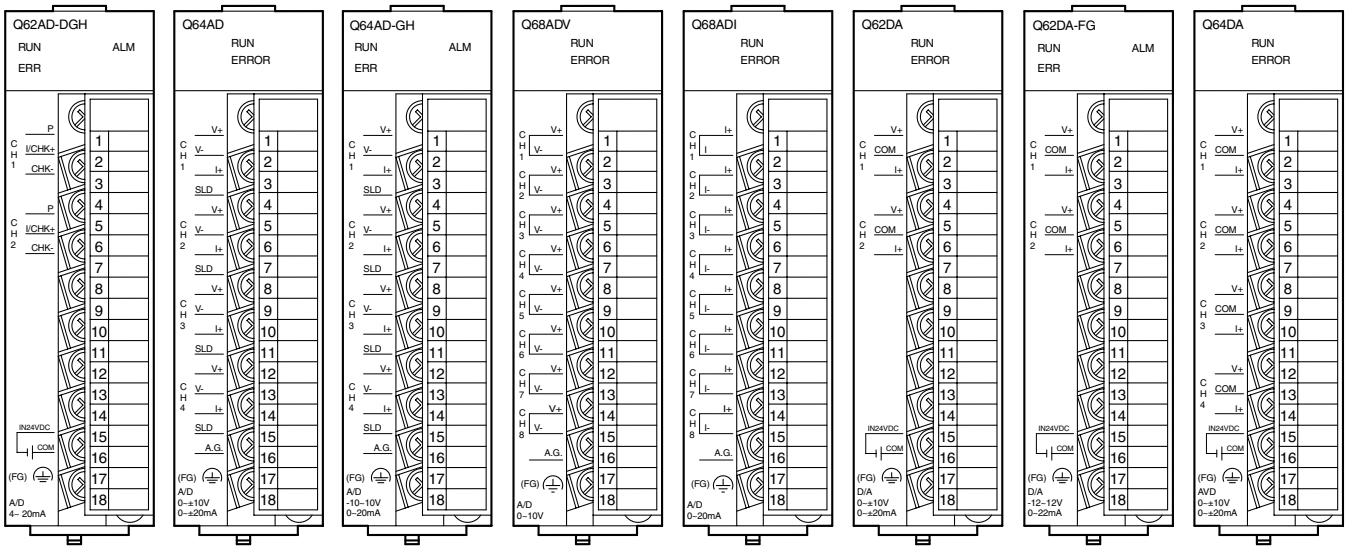


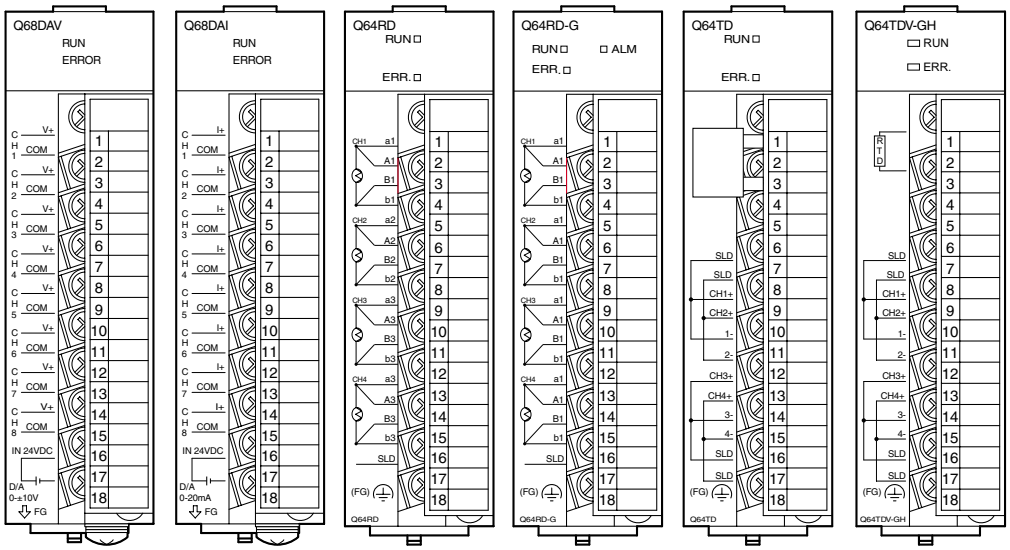
■ Digital Output Modules

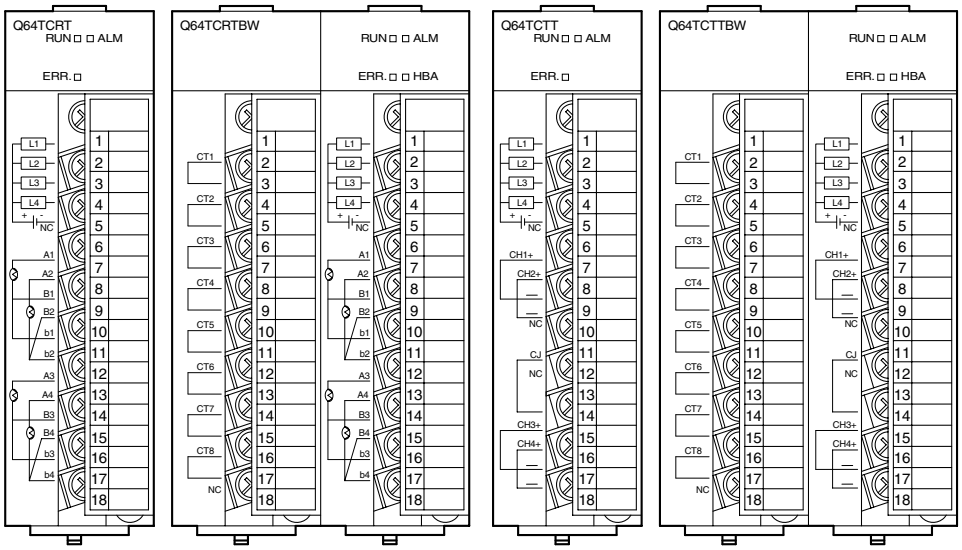




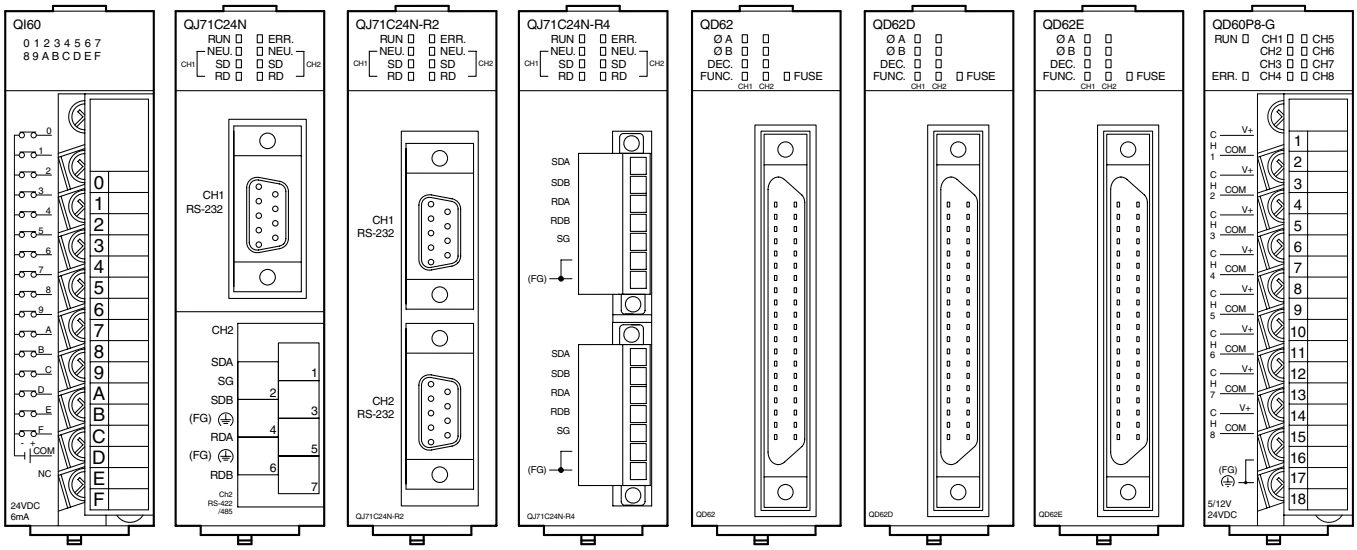
■ Analog Input/Output Modules

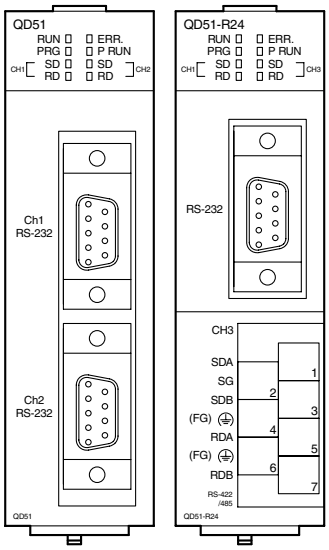




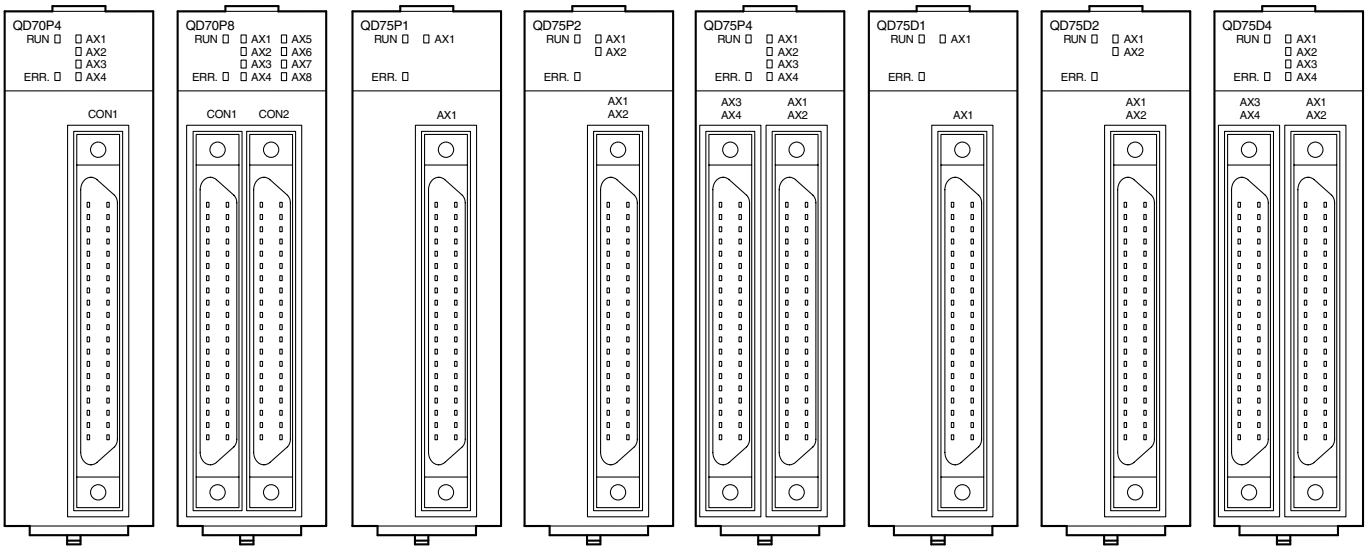


■ Special Function Modules

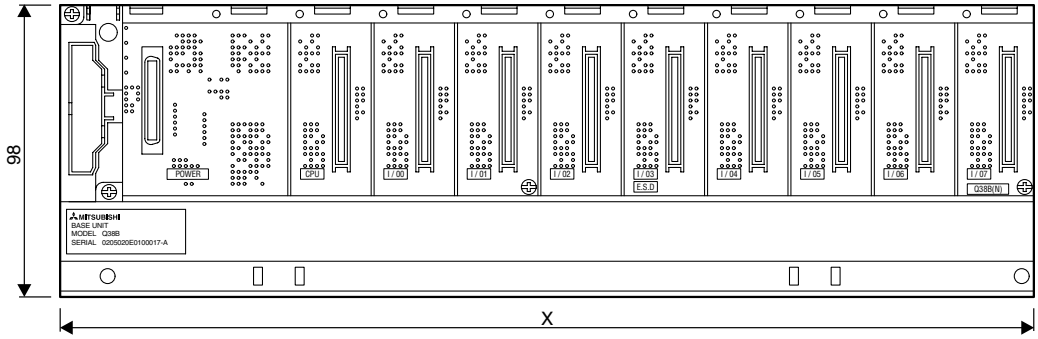




■ Positioning Modules

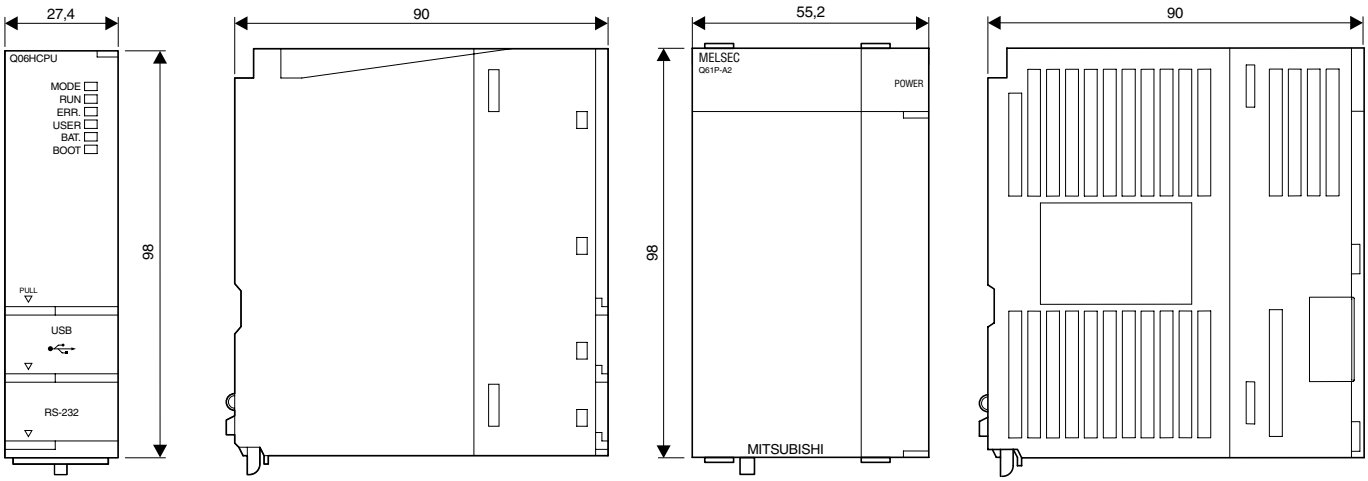


Base Units

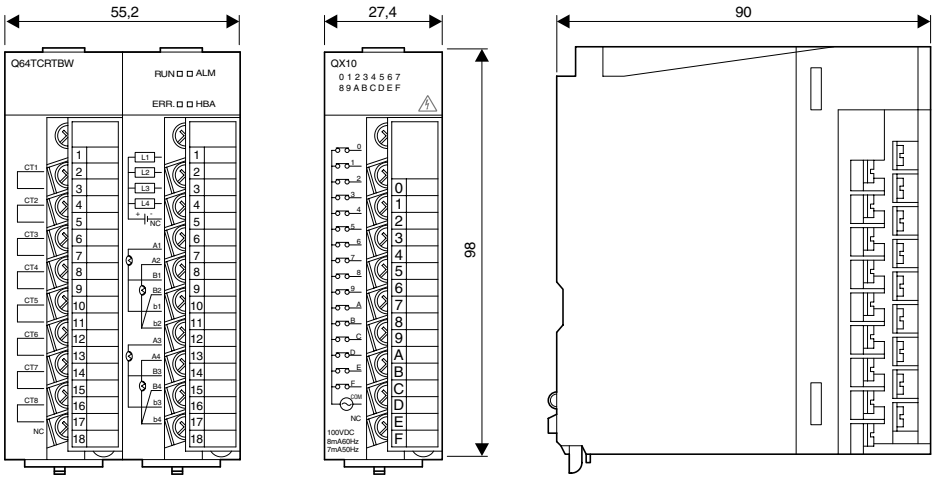


Type	X (in mm)
Q33B	189
Q35B	245
Q38B	328
Q312B	439
Q52B	106
Q55B	189
Q63B	189
Q66B	245
Q68B	328
Q612B	439
Q00JCPU-E	245

CPUs and Power Supply Modules

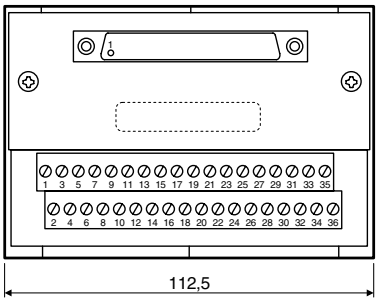


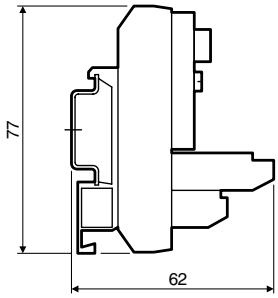
I/O Modules and Special Function Modules



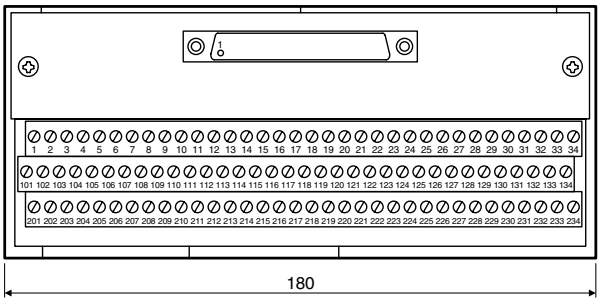
System Terminals

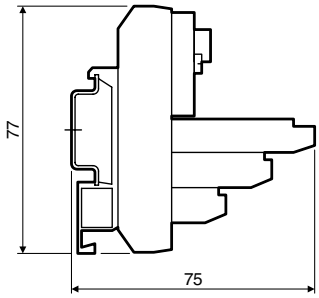
ST32 / ST-32-Diod



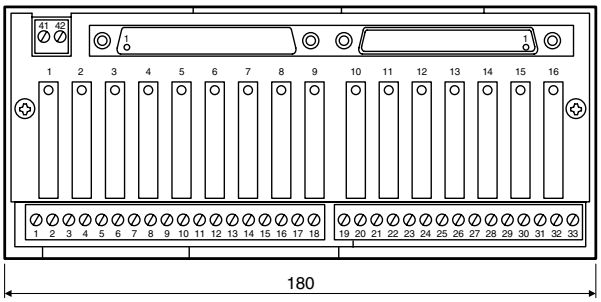


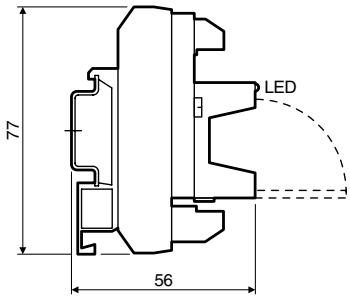
ST32-3





ST16-Socket





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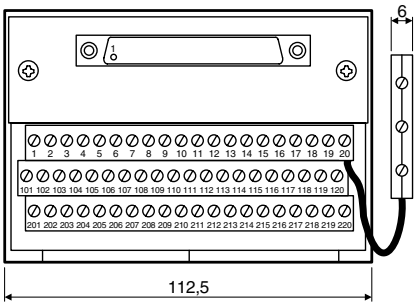
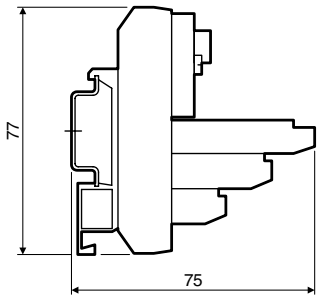
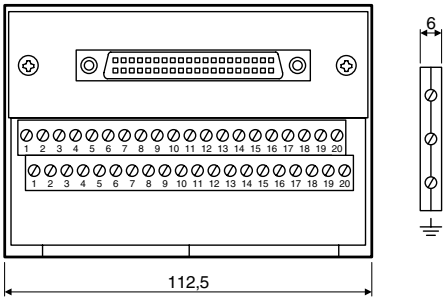
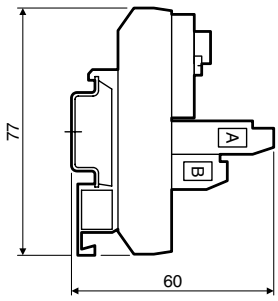


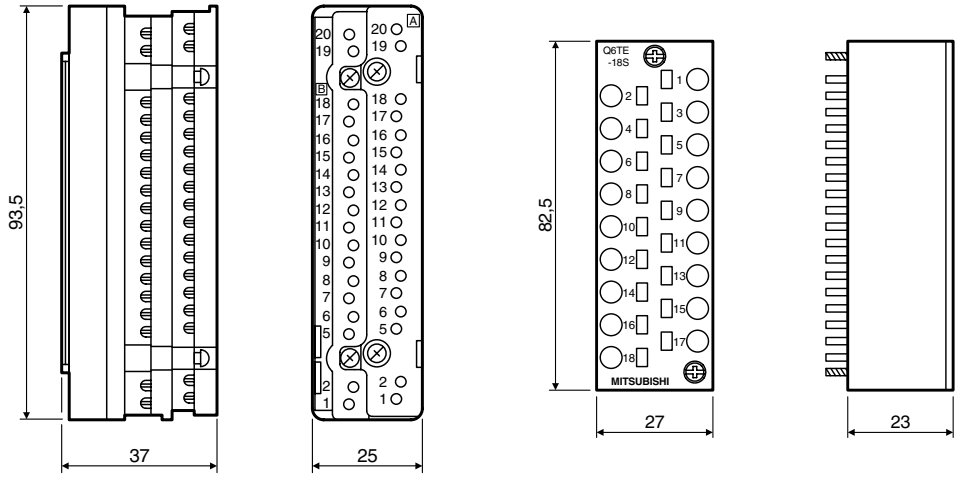


ST40



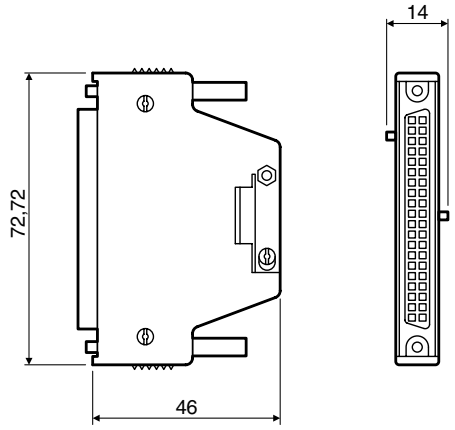


Terminal Block Adapters

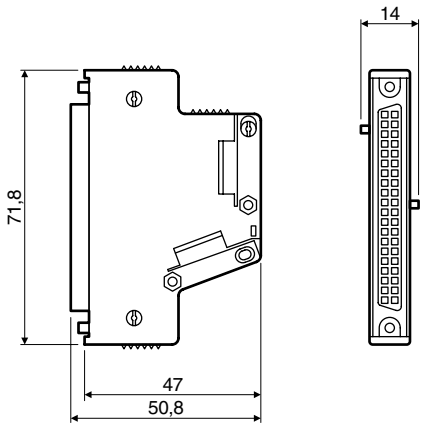


Connectors

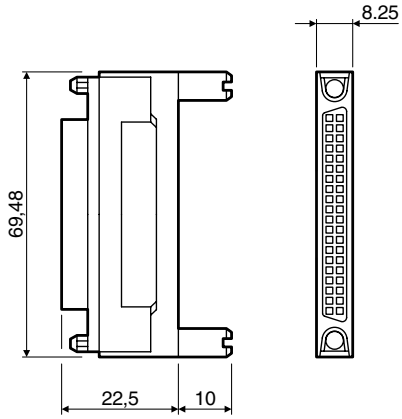
ACON1/2



ACON4



ACON3



MELSOFT – Programming and Documentation Software for Standard Personal Computers

With the MELSOFT software family Mitsubishi Electric offers efficient software packages helping to reduce programming and setup times to a high degree.

The MELSOFT software family provides instant access, direct communications, compatibility, and open exchange of variables.

The MELSOFT family comprises:

- Programming packages like GX Developer and GX IEC Developer
- Network configuration software like for example GX Configurator DP
- Visualization software like for example MX Scada
- Software for a dynamic data exchange like MX Change
- Various development software for operator terminals (please refer to the Technical Catalogue HMI)

GX Developer is recommended as a costeffective beginners package for the MELSEC System Q. This package offers a quick and easy introduction to programming.

For structured programming the IEC 1131 (EN 61131) conform programming software GX IEC Developer is recommended.

For detailed information please order our separate MELSOFT brochure.

■ GX Developer

GX Developer is the standard programming software for all MELSEC PLC series with the user guidance of Microsoft Windows.

With this software you can comfortably create PLC programs alternatively in the form of Ladder Diagrams or Instruction Lists. Both forms of representation can be toggled easily during operation.

Besides efficient monitoring and diagnostics functions GX Developer features an offline simulation of any PLC type.

With GX Developer all MELSEC PLCs from the FX1S to the Q25H are supported. The use of GX Developer FX is limited to the PLCs of the FX family.

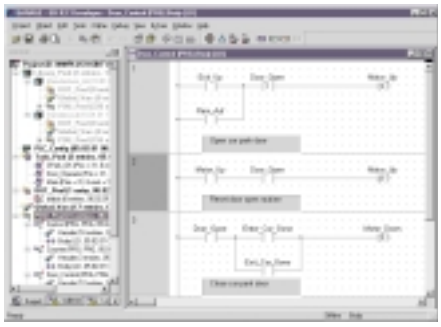
This software provides all the Windows-specific advantages and is especially suited to all MELSEC PLCs.

GX Developer can be run under Windows 95/98/XP and Windows NT/2000.

The software is supplied without a programming cable, which has to be ordered separately if required and which is used for the connection between the PLC and a serial interface of a personal computer.

Software		GX Developer V0800-1L0C-G	GX Developer V0800-1L0C-E
Series		All MELSEC PLCs	All MELSEC PLCs
Language		German	English
Order information	Art. no.	152816	150420
Accessories		Programming cable QC30R2, art. no.: 128424; QC30-USB, art. no.: 136577	

■ GX IEC Developer



GX IEC Developer provides all functions of the pre-mentioned programs and in addition meets the programming standard for the future: IEC 1131.3 (EN 61131). This makes the software ready for the programming standard of the future and offers as a basis for the on-leading programming of the MELSEC A and MELSEC system Q.

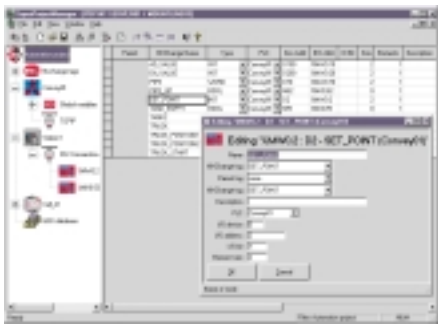
GX IEC Developer can be run under Windows 95/98/XP and Windows NT/2000.

The software is supplied without a programming cable, which has to be ordered separately if required and which is used for the connection between the PLC and a serial interface of a personal computer.

Software		GX IEC Developer V0600-1L0C-G	GX IEC Developer V0600-1L0C-E
Series		All MELSEC PLCs	All MELSEC PLCs
Language		German	English
Order information	Art. no.	152483	152536
Accessories		Programming cable QC30R2, art. no.: 128424; QC30-USB, art. no.: 136577	

Software for Process Visualisation and for Dynamic Data Exchange

■ MX Change



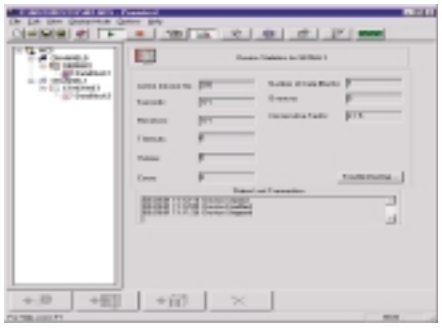
MX Change is integrated in the MELSOFT family as the “heart of automation”.
The software package consists of a Server and a Super Projekt Manager, other automation programs can be connected to.
Since MX Change operates across a network, any variable once declared can be used by all other systems connected to the database.

Through this method following the principle “define once and use anywhere” the development time can even be decreased drastically.

The software runs under Windows 95 and Windows NT/2000.

Software		MX Change V0210-1LOC-E	MX Change 200T V0210-1LOC-E	MX Change 200T V0210-0LOC-DEMO
Language		English	English	English
Executable tags			2 000	200
Disk type		CD ROM	CD ROM	CD ROM
Order information	Art. no.	141997	141996	141995

■ MX OPC Server



The OPC standard was developed for manufacturer independent communications between processes and Microsoft Windows® applications in client/server architecture.

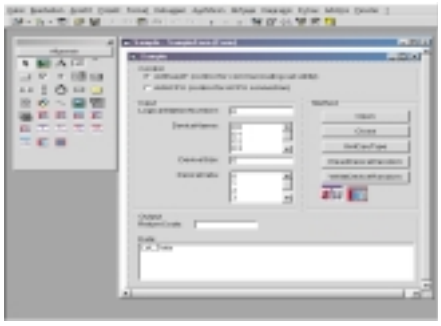
OPC means "OLE for Process Control" and represents an application of the Microsoft DCOM technology (Distributed Component Object Model). In contrast to Active-X the OPC based data exchange especially features a higher performance.

The MX OPC server is a standardized software interface that enables Microsoft Windows® applications to access a Mitsubishi PLC quick and easily.

The software runs under Windows 95/98 and Windows NT/2000.

Software		MX OPC Server V0100-1LOC-E
Series		All MELSEC PLCs
Language		English
Disk type		CD ROM
Order information	Art. no.	139793

MX Components



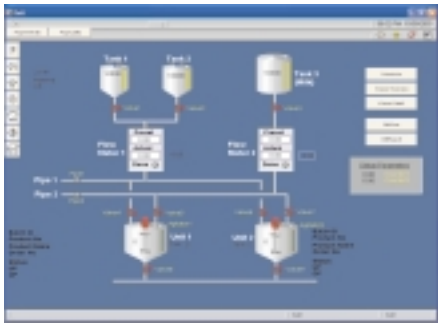
This software provides you with powerful Active-X elements. An internal driver manages the complete communications between your Microsoft Windows application and your process. Via MX components and a programming language (e.g. Visual Basic, Visual C++, etc.) you can easily create your own PC applications or integrate existing PC applications.

Moreover, via MX Components and VBA the complete MS Office range is at your service. Without high effort you can integrate online process data of a Mitsubishi PLC in your existing office software (e.g. MS Access or MS Excel etc.).

The software runs under Windows 95/98 and Windows NT/2000.

Software	MX Components V0200-1L0C-E
Series	All MELSEC PLCs
Language	English
Disk type	CD ROM
Order information Art. no.	142848

MX4 SCADA



MX4 SCADA is a process visualisation system that can handle everything from simple installations to complex production control systems. The software package can administer an almost unlimited objects.

MX4 HMI is designed for small applications where there is no need for an extensive networked solution. However, if the application expands then it is easy to upgrade to MX4 SCADA.

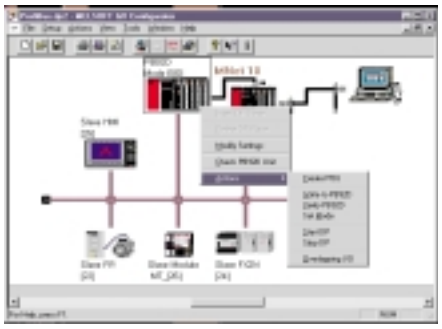
Also included with MX4 SCADA/MX4 HMI is FastLinx, a communication and data exchange tool that make set-up simple and directly links MX4 to GX IEC Developer to ensure consistent use of PLC devices.

The software runs under MS Windows® 95/98/NT4/2000 and XP and is available in a variety of different versions geared to the objects to be handled.

Software	Development version	Run-time version
Series	All MELSEC PLCs	All MELSEC PLCs
Language	English	English
Disk type	CD ROM	CD ROM
Order information Art. no.	On request	On request

Software for PROFIBUS Networks

GX Configurator DP



The Software GX Configurator DP is a user friendly configurations software for the open network PROFIBUS/DP.

The software package is a 32 bit application and runs under Windows 95/98 and Windows NT4.0. Configuration of all PROFIBUS modules for the MELSEC A/Q and the MELSEC system Q and also the FX family is possible.

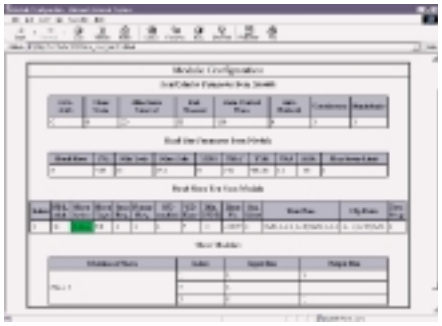
Due to the supported extended user parameters of a GSD file, easy parameter setting of PROFIBUS/DP slave devices is possible even for third party devices.

The new GX Configurator DP enables the download of all configuration data via an overriding network.

All PROFIBUS modules are configured via the backside bus.

Software	GX Configurator DP V0600-1L0C-E
Supported Profibus/DP master modules for the Mitsubishi MELSEC series	A1SJ71PB92D, AJ71PB92D, QJ71PB92D
Language	English / German
Disk type	CD ROM
Order information Art. no.	155928
Accessories	Programming cable QC30R2, art. no.: 128424; QC30-USB, art. no.: 136577

GX Monitor DP



With the new GX Monitor DP Software it is possible to make Diagnostics in graphical or text for PROFIBUS/DP networks and PLC via Internet. With the use of the standard Internet Explorer® it is quite simple to use and easy to run on different PC platforms.

This software can be used independent or in combination with GX Configurator DP.

Software	GX Monitor DP V0100-1L0C-E
Supported PROFIBUS/DP master modules for the Mitsubishi MELSEC series	A1SJ71PB92D, AJ71PB92D, QJ71PB92D, QJ71PB93D
Language	English
Disk type	CD ROM
Order information Art. no.	143971
Accessory	Programming cable SC-09, art. no.: 43393

PROFIBUS Master Simulator

The PROFIBUS Master Simulator is an easy to use and versatile utility for the specifications exchange with PROFIBUS slaves. For this purpose the PROFIBUS Master Simulator is capable of exchanging the specifications with many slaves even without a GSD file, a type file, and a PROFIBUS master. Without further input or additional files PROFIBUS slaves can be startet using their base I/O range.

Input specifications can be read and output specifications can be written. Furthermore, the PROFIBUS DP Master Simulator obviously supports GSD files as well as entering particular configurations for starting the specifications exchange with PROFIBUS slaves. Adressing is supported either. The PROFIBUS Master Simulator provides an option to scan the entire PROFIBUS for connected participants and display them graphically.

The PROFIBUS Master Simulator is a development of the company Bihl & Wiedemann GmbH (www.bihl-wiedemann.de) and is not distributed by Mitsubishi Electric.

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Order declaration

Pos.	Number	Item (type)	Article number	Description	Remarks

Notes when ordering:
When ordering, please use only the type designations and order numbers shown in this catalogue.

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