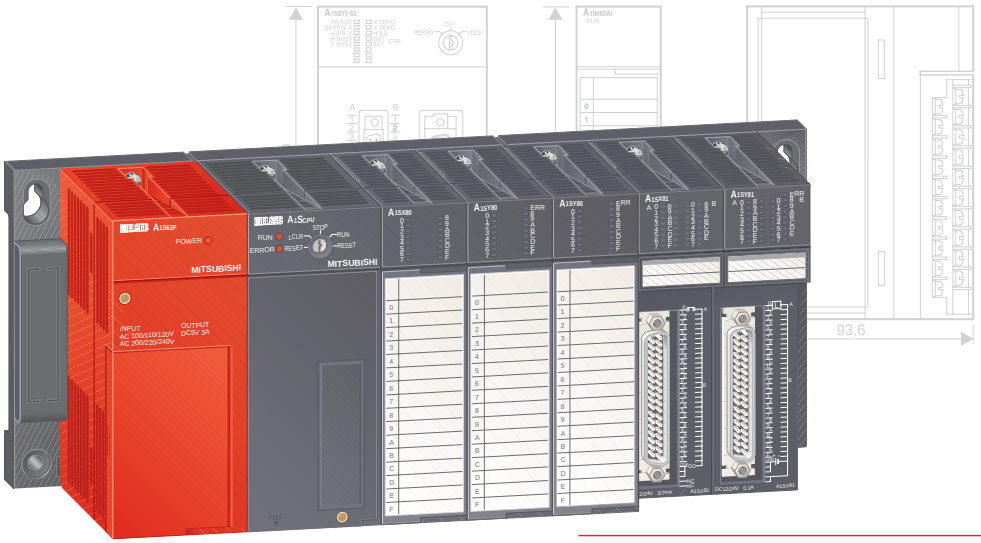
MITSUBISHI ELECTRIC

Programmable
Logic
Controllers




# MELSEC AnS, QnAS




# Technical Catalogue

2000

Return

## New Items in this Catalogue

New Products 03/00

***Basic Components***

The SLOT PLC A80BDE-A2USH-S1 adds a MELSEC CPU in the form of a plug-in board for a personal computer to the CPUs of the AnS/QnAS series.

***Communications and Special Functions Modules***

The line of MELSECNET/10 modules is extended by the floating master module AJ71QLR21 for coaxial connections.

The former MELSECNET/10 interface boards A7BDE-J71LP21 and A7BDE-J71BR11 were replaced by the 4 newly developed boards A70BDE-J71QLP23, A70BDE-J71QLP23GE, A70BDE-J71QLR23, and A70BDE-J71QBR13.

For the AS interface the master module A1SJ71AS92 is provided for the connection between the AnS/QnAS and the AS-I network.

***Software***

The graphical programming software IDR-BLOK for closed-loop control systems is supplemented by the co-processor module A1SD51S-IDR and the function modules IDR10F-STD and IDR10F-ADV

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## Further Publications within the PLC Range

Technical Catalogues

***AnU, QnA Series Technical Catalogue***

Product catalogue for programmable logic controllers and accessories for the MELSEC A and Q series (art no. 61747)

***FX Series Technical Catalogue***

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

***HMI Technical Catalogue***

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

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TÜV CERT DIN ISO 9001 / EN 29001

CE

**About this product catalogue**

This catalogue is periodically updated due to product range enlargement, technical changes or new or changed features. For actual information about updates, changes, news or even support matters please contact the MITSUBISHI MEL-FAX faxback system (fax: +49 2102 486-485 or -790 ) or have a look at the MITSUBISHI ELECTRIC web pages under www.mitsubishi-automation.com. Both media are nearly daily updated and available in two languages.

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 series 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 this documentation must be read before installation and commissioning of the units or software.

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

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## MELSEC AnS/QnAS



## PROGRAMMING SYSTEMS



## APPENDIX

# The MELSEC AnS Series

## Description

With the MELSEC AnS system, MITSUBISHI ELECTRIC presents its most compact modular PLC, permitting access to the world of network technology.

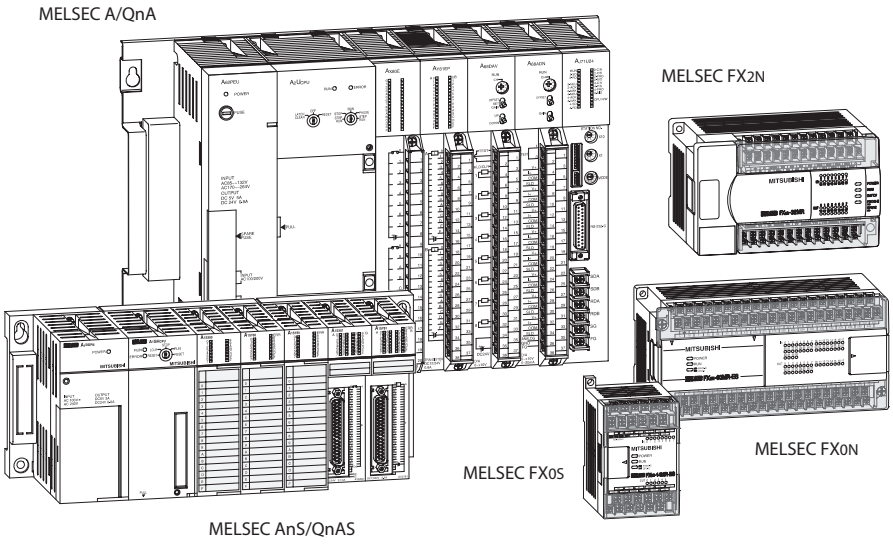
The small size and the communications capability are two important characteristics of the MELSEC AnS. Its compactness ensures that it occupies less space in the switchgear cabinet and its diverse communication facilities guarantee flexibility and openness. Expandable from 32 to 1024 inputs/outputs, this controller is particularly suitable for performing small to medium automation tasks, very fast automation also being possible with the A2ASCPU.

The individual systems can be installed in a local network (MELSECNET), enabling them to communicate with one another. The number of I/O points can thus be increased several times over.
All CPU types can be combined freely with one another.

The MELSEC AnS is a member of the MELSEC PLC family, which offers compatibility across the range.

## Special features

- expandable from 32 to 1024 inputs/output points
- interchangeable intelligence
- diverse communications facilities
- easy installation
- individual adaptation to existing systems
- innovative technology for future applications




## Expandability and performance

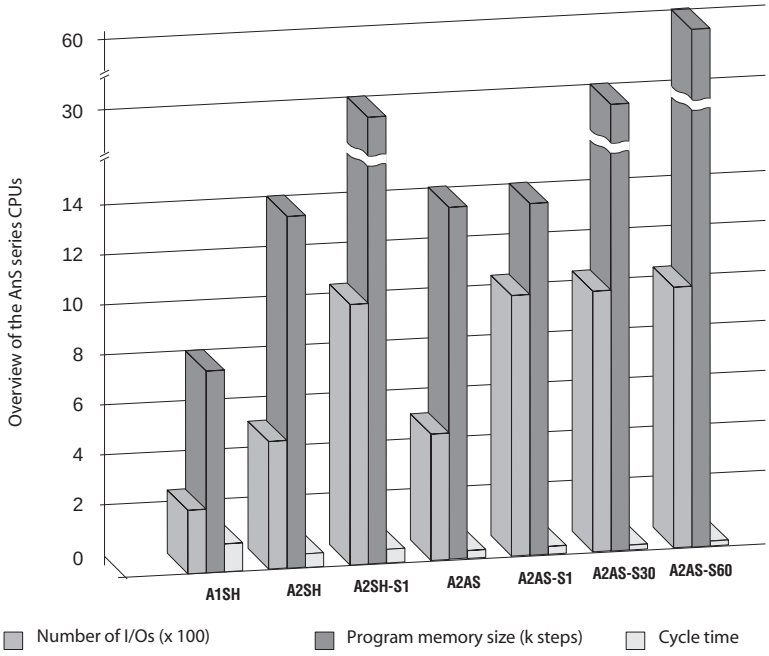
In the AnS series, simply changing the CPU ensures that the performance of the PLC grows with the application. Thus, up to 1024 input/output addresses and up to 60 k program memories can be accessed.

The AnS CPUs all have a permanently installed RAM of up to 256 kbyte in which, among other things, the PLC program can be saved. However, EPROM and EEPROM memory cassettes are also available for permanent storage.

In all CPU modules, the memory content is protected by an integrated backup battery.

The MELSEC AnS offers tailor-made performance through seven different CPUs:

- **A1SHCPU**, the standard CPU with 256 I/O points and a PLC program memory of 8 k steps
- **A2SHCPU**, the more powerful alternative with 512 I/O points and a PLC program memory of 14 k steps
- **A2SHCPU-S1**, the extended version of the A2SHCPU with 1024 I/O points and a PLC program memory of 30 k steps
- **A2ASCPU**, the most powerful CPU for realizing extremely fast automation tasks with 512 I/O points and a PLC program memory of 14 k steps
- **A2ASCPU-S1, A2ASCPU-S30/-S60** the extended alternative to the A2ASCPU for up to 1024 I/O points and a PLC program memory of 14 k steps for the A2ASCPU-S1 and 30 k or 60 k steps for the A2ASCPU-S30 and A2ASCPU-S60.
- With up to 0.15 µs per logical instruction, time-critical automation tasks can also be performed. The A2ASCPU-S30 and A2ASCPU-S60 is thus intended for very complex applications.

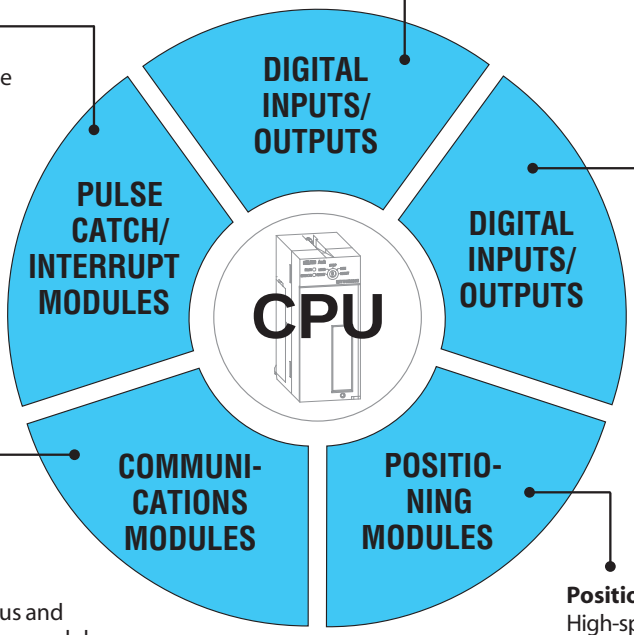


## Equipment Features

Owing to the modular concept, the AnS series 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.




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

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

**Analog input/output modules**
for current/voltage signals and for temperature measurement as well as temperature controlling with facility for direct connection of Pt100 resistance thermometers or thermocouplers

**Communications modules**
Interface modules with RS232/RS422/RS485 interface for connection of peripherals or for PLC-PLC coupling. Network modules for Ethernet and Profibus 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 drive

### 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.

With some special function modules, the use within a system is limited. These restrictions also apply to the use of modules of the MELSEC AnU series in the AnS system.

All affected modules are listed in the adjacent table.

| Module types | | Limitation | | |
|---|---|---|---|---|
| AnS/QnAS series | AnU/QnA series | A1SHCPU, A2SHCPU(-S1) | A2ASCPU(-S1), A2ASCPU-S30/-S60 | Q2ASCPU(-S1), Q2ASHCPU(-S1) |
| A1SJ71UC24-R2 (PRF/R4), A1SJ71E71-B2(-S3), A1SD51S | AD51(-S3), AD51H(-S3), AD57G(-S3), AJ71C22, AJ71C24(-S3/-S6/-S8), AJ71UC24, AJ71E71(-S3) | up to 2 modules per system | up to 6 modules per system | up to 6 modules per system |
| A1SI61 | AI61(-S1) | only 1 module per system | only 1 module per system | only 1 module per system |
| A1SJ71AT21B, A1SJ71AR21 | AJ71AT21B, AJ71AR21, AJ71AP21 | only 1 module per system | up to 2 modules per system * | up to 2 modules per system * |
| A1SJ71BR11, A1SJ71LP21GE, A1SJ71LP21 | AJ71BR11, AJ71LP21GE, AJ71LP21 | only 1 module per system | up to 4 modules per system * | not possible |
| A1SJ71QBR11, A1SJ71QLP21 | AJ71QBR11, AJ71QLP21, AJ71QLP21G | not possible | not possible | up to 4 modules per system * |
| A1SJ71QE71-B2/-B5 | AJ71QE71 | not possible | not possible | |
| A1SJ71QC24(-R2) | AJ71QC24 | not possible | not possible | no limit |

* In this case the total number of modules is limited to 4 (e.g. 2 x AJ71AT21B + 2 x A1SJ71BR11)

## The MELSEC QnAS Series

### Description

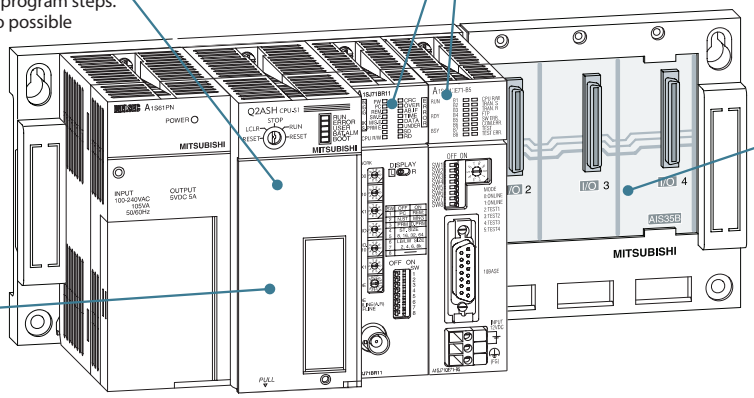
The MELSEC QnAS(H) series is an extremely compact and very powerful new generation of controllers from MITSUBISHI ELECTRIC. Outstanding features include very fast program cycles, ample memory for large amounts of data (approx. 1 mega words) and significantly increased network access speed. These controllers are ideal for medium-scale applications requiring up to 1024 centralised I/Os in the switchgear cabinet or up to 8192 remote I/Os.

The QnAS series is also hardware-compatible to the AnS series – this means you can continue to use your modules from this series.

**QnAS(H)CPU**
Ideal for time-critical applications with execution speeds as fast as 0.075 µs per logical instruction.

Integrated memory for up to 60 k program steps. Many additional functions are also possible without additional instruction

**A1SJ71QBR11, A1SJ71QE71-B2/B5**
QnAS series networks support high-speed access to CPU data during the END instruction, bringing a speed increase of up to a factor of 8 compared to conventional systems.




**A1S38HB**
High-speed base unit that significantly increases the overall performance of the entire system.
If high-speed access to the QnAS series CPU via the network is not necessary, a standard base unit can be used.

**PCMCIA RAM/EEPROM**
One slot for PCMCIA RAM/ EEPROM cards

### Expansion capability and performance

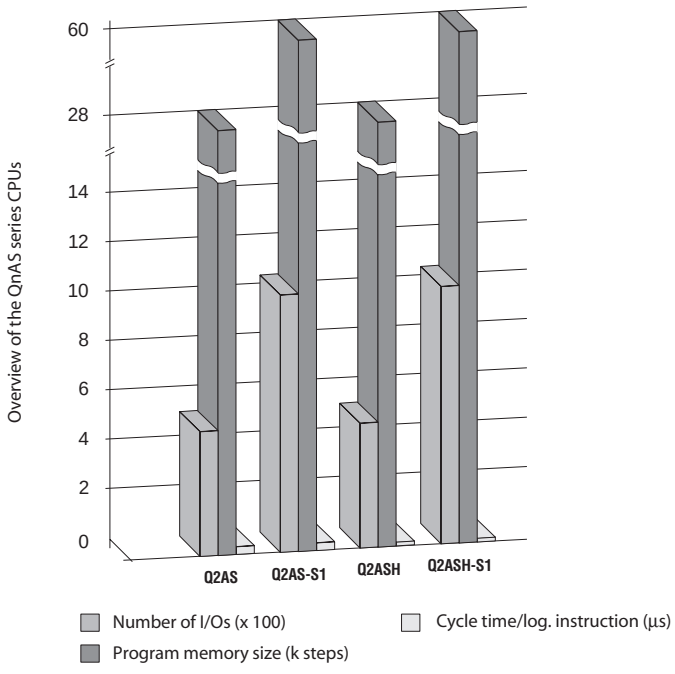
As with other Mitsubishi controllers the power of the QnAS series grows with your application – you simply replace the CPU. The system can be upgraded to a maximum capacity of 1024 centralised I/Os or 8192 remote I/Os.

The integrated memory of 240 KB RAM can easily be expanded by up to 2 MB at any time just by slotting in a PCMCIA RAM card.

PCMCIA EEPROM cards are also available for permanent storage of your controller programs. An integrated battery protects the data in the CPU's internal RAM against power failures.

The QnAS(H) series includes four different CPU models for tailor-made configurations:

- **Q2ASCPU** 28 k steps program memory, program cycle period 0.15 µs/logical instruction, 512 I/O points on the system rack.
- **Q2ASCPU-S1** 60 k steps program memory, program cycle period 0.15 µs/logical instruction, 1024 I/O points on the base unit.
- **Q2ASHCPU** 28 k steps program memory, program cycle period 0.075 µs/logical instruction, 512 I/O points on the base unit.
- **Q2ASHCPU-S1** 60 k steps program memory, program cycle period 0.075 µs/logical instruction, 1024 I/O points on the base unit.

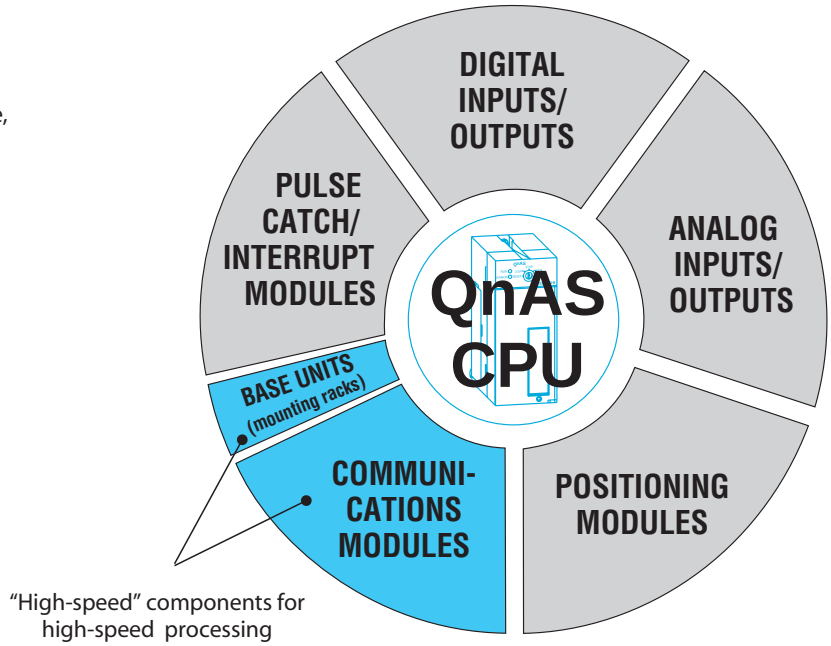


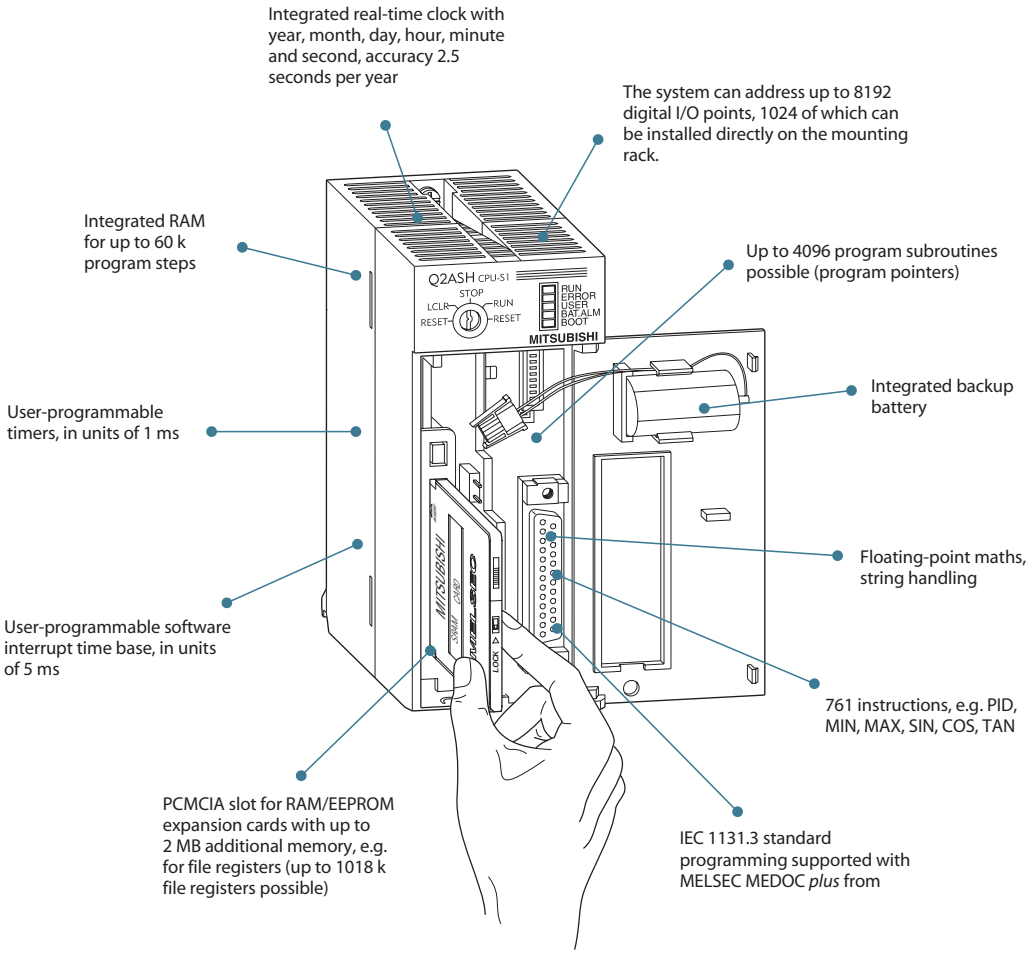
## Equipment Features

### QnAS highlights

High program execution speed and extremely fast network access were top priorities in the development of this new generation of controllers. At the same time, our engineers also took utmost care to maintain full compatibility to the existing A1S hardware to protect our users investment in their existing systems.

The QnAS CPU's high-speed network access features require the A1S38HB high-speed base unit in combination with the appropriate network card. All conventional I/O modules (both analog and digital) and positioning modules can be used on the high-speed base unit.



## Configuration

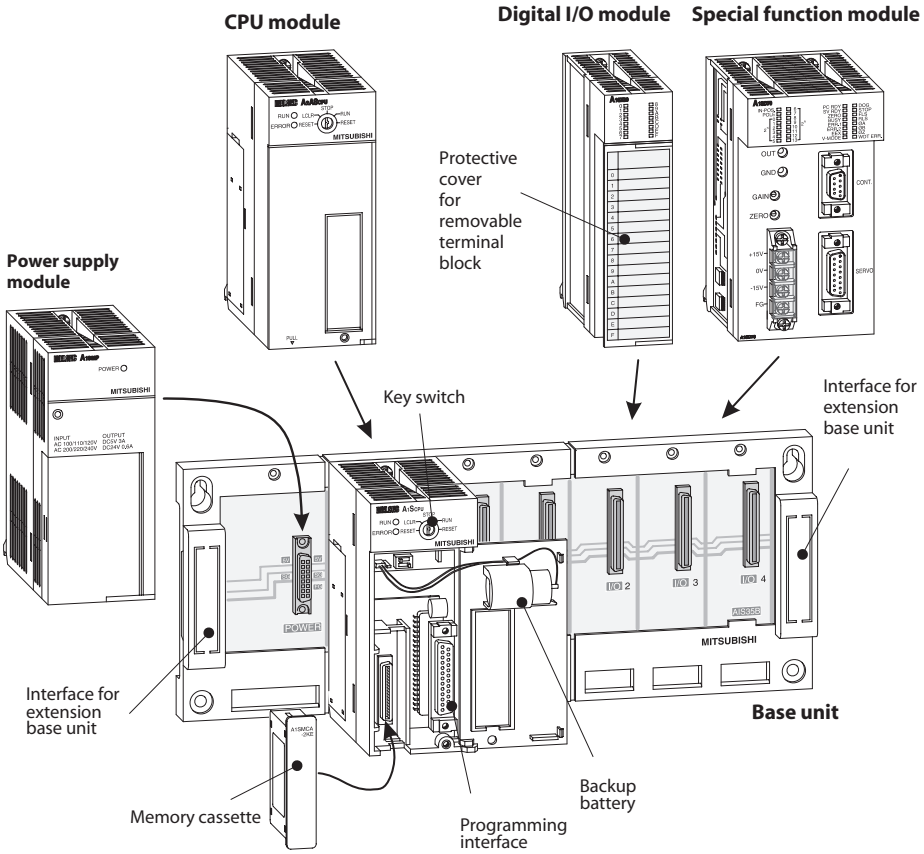
### System structure

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

The main base units are available in 4 different versions with 2 to 8 module slots. Each base unit can be supplemented by means of an extension base 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 main 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. These modules are connected by means of a shielded two-wire cable.



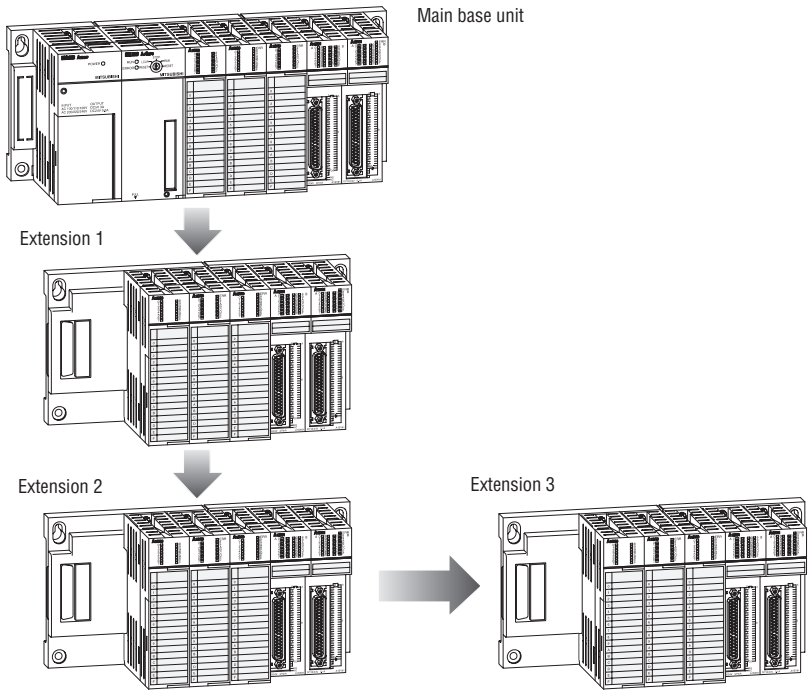

### Extension

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

Up to three extension base units can be connected to a main base unit. The extension may be in the horizontal or vertical direction.

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 base unit with a further power supply module should be used.

Base units of the MELSEC AnA/AnU series can also be combined with the AnS series using a special cable.

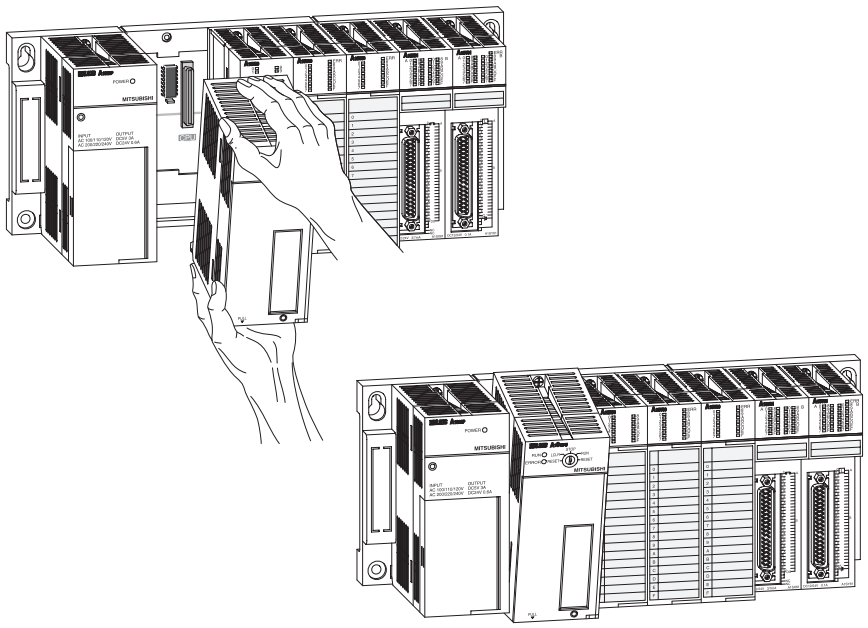


## Handling

### Mounting the modules

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

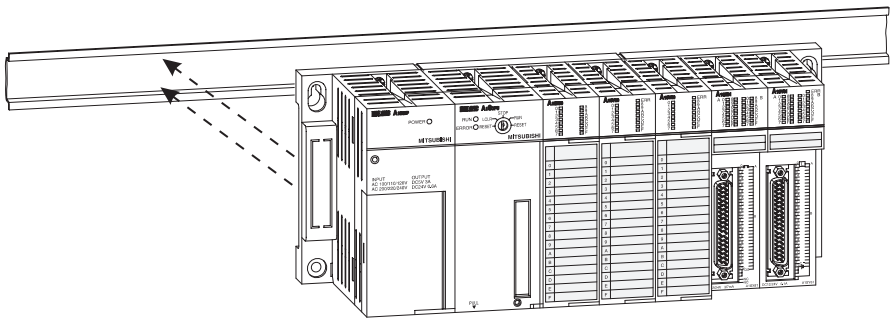
If it becomes necessary to change an I/O module, the screw terminal block can be removed beforehand. Thus, it is not necessary to disconnect the entire cabling but only 2 screws.



### Mounting the base unit

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

The individual base units can be mounted either side by side or up to 6 m apart.



## General specifications

| General Specifications | Data |
|---|---|
| Ambient temperature | 0 – +55 °C |
| Storage temperature | -20 – +75 °C |
| Ambient relative humidity | max. 90 % (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) |
| 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 |
| 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 / RINA / LR |

① Approvals for MELSEC AnS series and CE certifications for MELSEC QnAS series 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 und -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

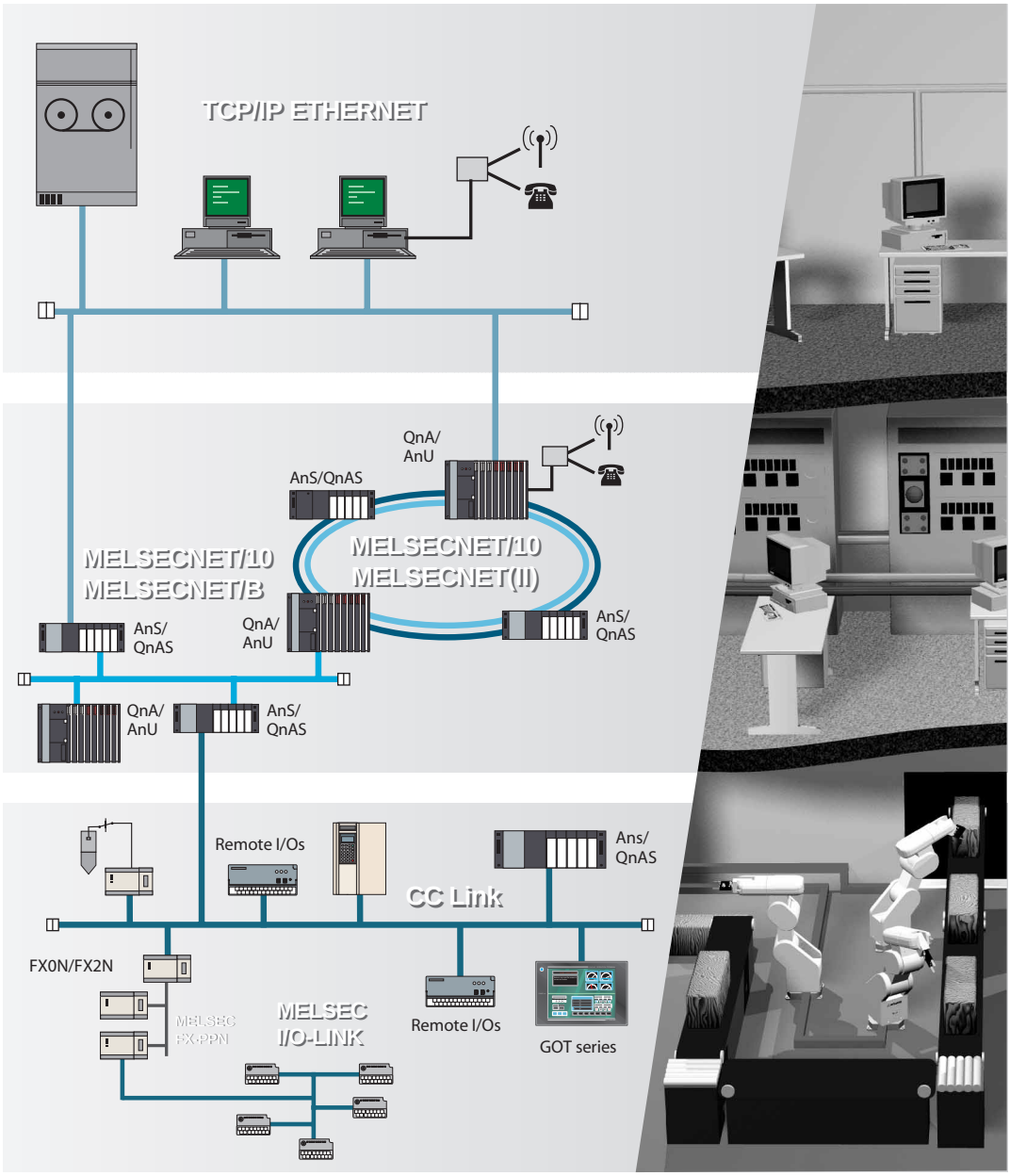
The PPN construction enables a network for up to 8 FX2N and FX0N controllers as clients.

The max. coverage is up to 500 m.
A standard twisted-pair cable can be used as the communications media.

**COMMAND LEVEL**
TCP/IP ETHERNET

**CONTROL LEVEL**
MELSECNET/10
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.

### Profibus FMS

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

### Profibus DP

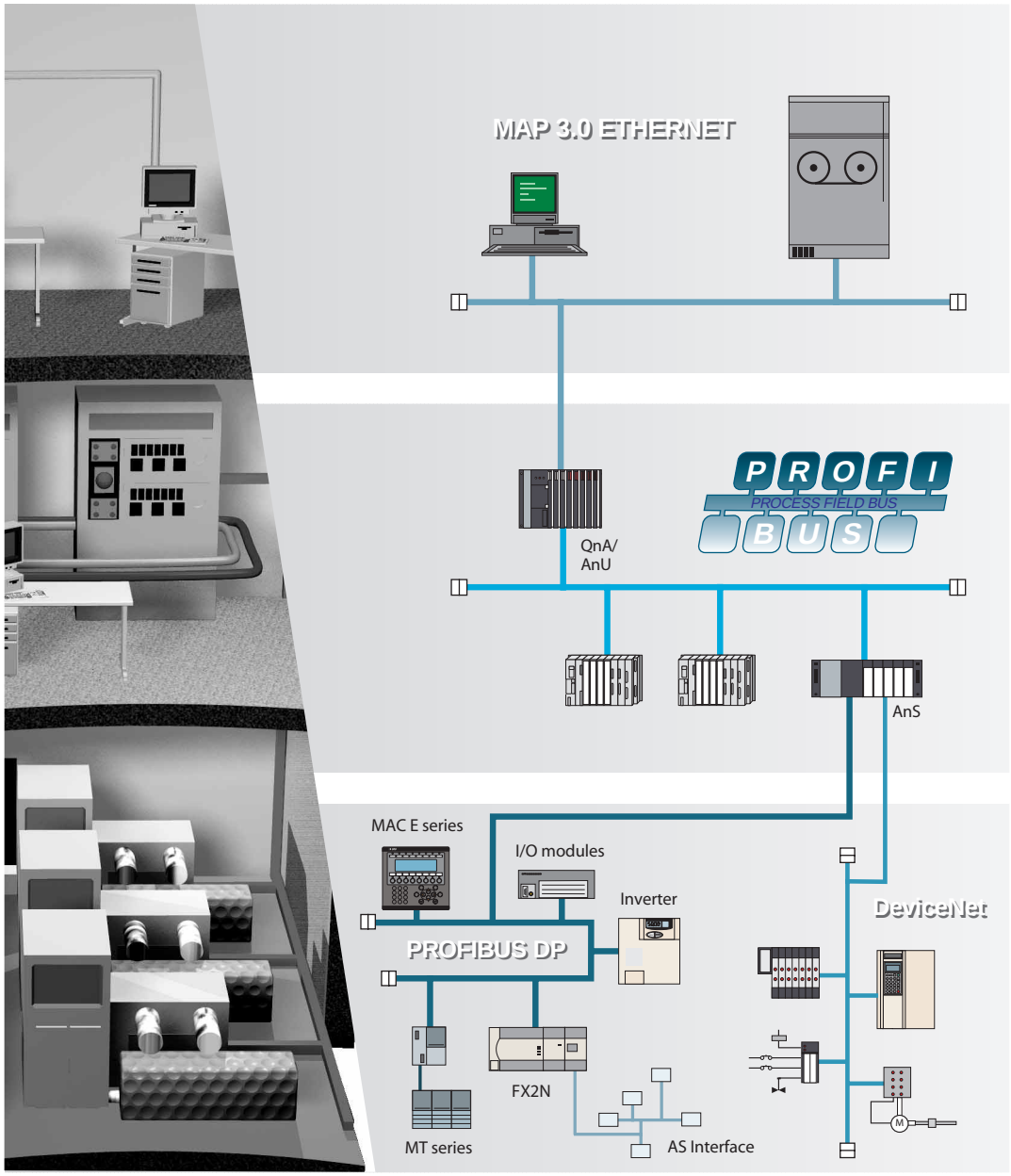
Enables quick and simple connection of sensors and actuators from different manufacturers to MELSEC PLCs, with data transfer rates of up to 12 Mbaud.

### 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 conventionel sensors and actuators with twisted pair cable.

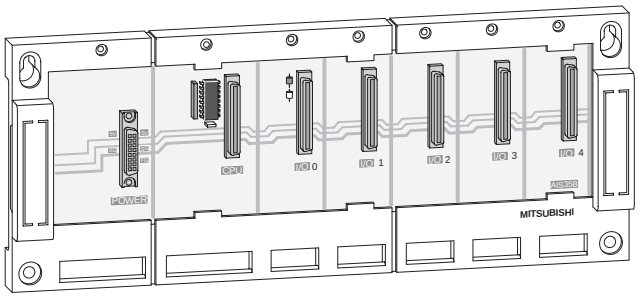



**COMMAND LEVEL**
MAP 3.0 ETHERNET

**CONTROL LEVEL**
Profibus FMS

**PRODUCTION LEVEL**
Profibus DP
DeviceNet
AS Interface

## ■ MELSEC AnS/QnAS Main Base Units




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

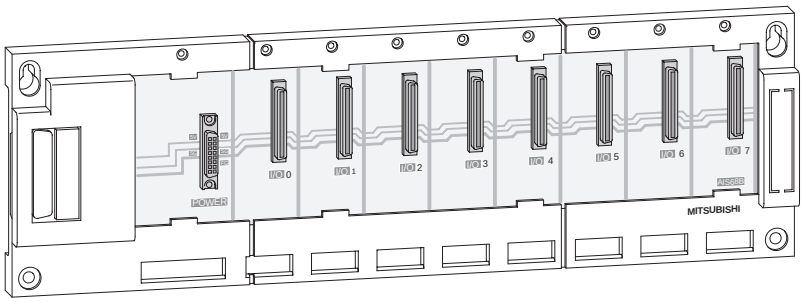
### Special features:

- The modules are automatically addressed. In general, it is assumed that base units with 8 slots will be used. Dummy slots or missing slots (in the case of base units with less than 8 slots) are assigned to 16 addresses. 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 | | A1S32B-E | A1S33B-E | A1S35B-E | A1S38B-E | A1S38HB-EU |
|---|---|---|---|---|---|---|
| I/O modules | | 2 | 3 | 5 | 8 | 8 |
| Installation | | All base units possess an installation hole ∅ 6 mm and M5 screws. * | | | | |
| Weight | kg | 0.52 | 0.65 | 0.75 | 0.97 | 1.0 |
| Dimensions (W x H x D) | mm | 220 x 130 x 28 | 255 x 130 x 28 | 325 x 130 x 28 | 430 x 130 x 28 | 430 x 130 x 28 |
| **Order information** | Art. no. | 48370 | 48371 | 48372 | 48373 | 69663 |

* An adapter is integrated for mounting on a DIN rail.

## ■ MELSEC AnS/QnAS Extension Base Units




The extension base units are connected to the main base unit by means of assembled bus cables. Thus, an AnS/QnAS system can be expanded to 32 I/O modules. Extension base units with or without their own power supply module are available.

### Special features:

- A total of three extension base units can be connected to a main base unit.
- The maximum distance from the first to the last base unit is 6 m.

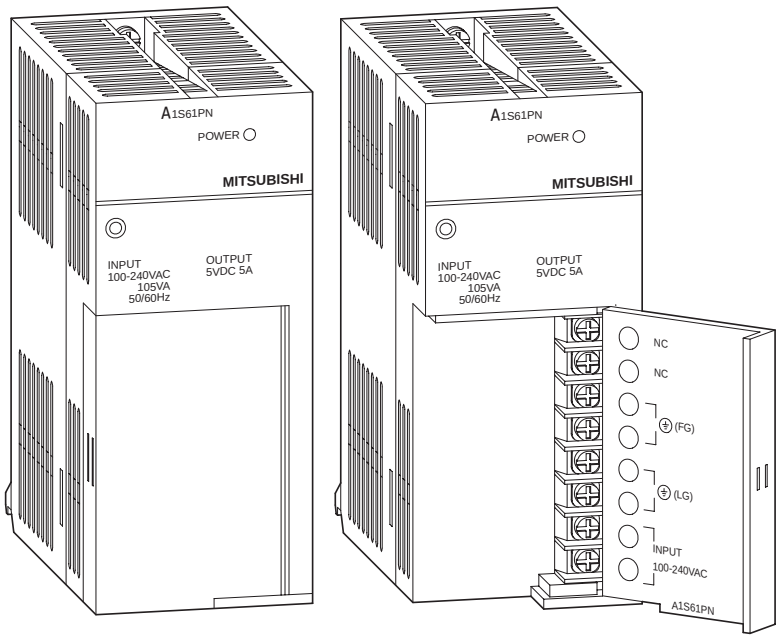
An extension base unit with a power supply module must be used in the following cases:

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

| Specifications | | A1S52B-S1 | A1S55B-S1 | A1S58B-S1 | A1S65B-S1 | A1S68B-S1 |
|---|---|---|---|---|---|---|
| Power supply modules | | — | — | — | 1 | 1 |
| I/O modules | | 2 | 5 | 8 | 5 | 8 |
| Installation | | All base units possess an installation hole ∅ 6 mm and M5 screws. * | | | | |
| Weight | kg | 0.38 | 0.61 | 0.87 | 0.71 | 0.95 |
| Dimensions (W x H x D) | mm | 155 x 130 x 28 | 260 x 130 x 28 | 365 x 130 x 28 | 315 x 130 x 28 | 420 x 130 x 28 |
| **Order information** | Art. no. | 39667 | 38073 | 38072 | 38071 | 38070 |
| **Accessories** | | Connection cables (refer to page 79) | | | | |

* An adapter is integrated for mounting on a DIN rail.

## ■ MELSEC AnS/QnAS Power Supply Modules




### Power supply modules

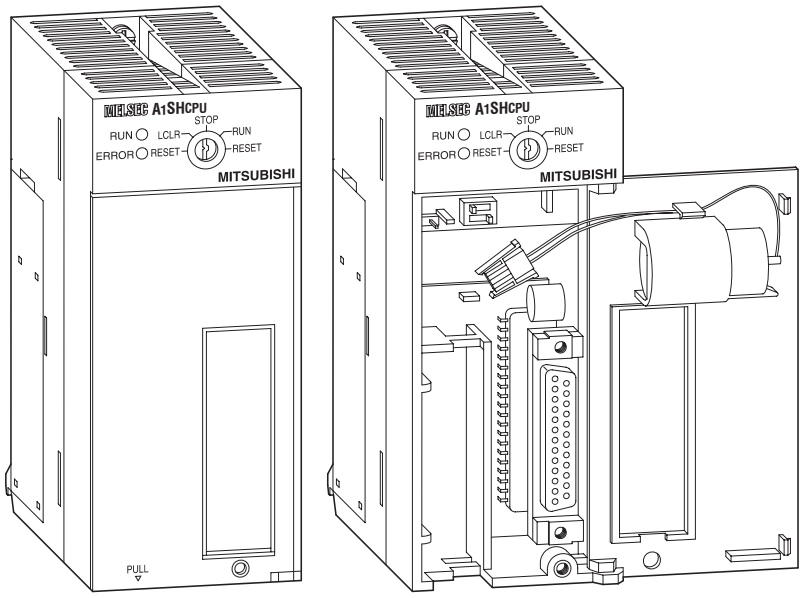
They supply the individual modules with the voltages required for operation. The choice is dependent on the power consumption of the individual modules.

### Special features:

- The readiness for operation is indicated by a red LED.
- For example, controllers can be supplied by means of additional 24 V DC output (A1S62PN).
- The power supply modules A1S61PN and A1S62PN can be used world wide because they support the wide input range from 100 to 240 V AC at 50/60 Hz.

| Specifications | | | A1S61PN | A1S62PN | A1S63P |
|---|---|---|---|---|---|
| Input voltage | (+10%, -15%) | V AC | 100 – 240 | 100 – 240 | — |
| | (+30%, -35%) | V DC | — | — | 24 |
| Input frequency | | Hz | 50 / 60 (±5 %) | 50 / 60 (±5 %) | — |
| Inrush current | | | 20 A within 8 ms | 20 A within 8 ms | 81 A within 8 ms |
| Max. input apparent power | | | 105 VA | 105 VA | 41 W |
| Rated output current | 5 V DC | A | 5 | 3 | 5 |
| | 24 V DC ±10 % | A | — | 0.6 | — |
| Overcurrent protection | 5 V DC | A | ≥ 5.5 | ≥ 3.3 | ≥ 5.5 |
| | 24 V DC | A | — | ≥ 0.66 | — |
| Overvoltage protection | 5 V DC | V | 5.5 – 6.5 | 5.5 – 6.5 | 5.5 – 6.5 |
| | 24 V DC | V | — | — | — |
| Efficiency | | | ≥ 65 % | ≥ 65 % | ≥ 65 % |
| Insulation withstand voltage | between primary and 5 V DC | | 2830 V AC, 1 min. | 2830 V AC, 1 min. | 500 V AC, 1 min. |
| | between primary and 24 V DC | | — | 2830 V AC, 1 min. | — |
| Max. compensation time at power failure | | ms | 20 | 20 | 1 |
| Power indicator | | | All modules possess a power LED display. | | |
| Terminal screw size | | | All modules possess terminal screw size M 3.5 x 7. | | |
| Applicable wire size | | | AWG 18 – 14 | AWG 18 – 14 | AWG 16 – 22 |
| Weight | | kg | 0.8 | 0.8 | 0.5 |
| Dimensions (W x H x D) | | mm | 54.5 x 130 x 93.6 | 54.5 x 130 x 93.6 | 54.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 65051 | 65052 | 29536 |

## MELSEC AnS CPU Modules




### A1SHCPU, A2SHCPU(-S1)

7 different CPUs with graded performance are available for the MELSEC AnS. All versions are upwardly compatible. Thus, the MELSEC AnS can grow with the application if the CPU is changed.

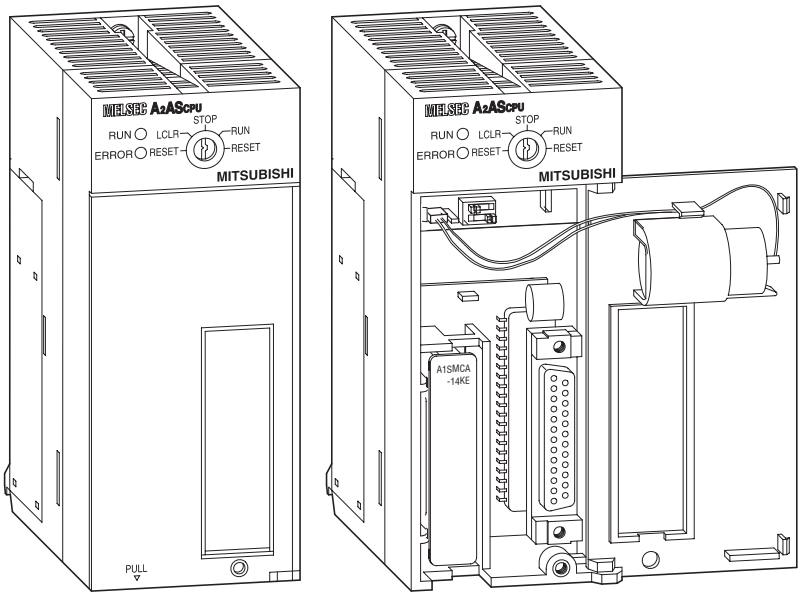
### Special features:

- Integrated RAM as standard feature for storing the PLC program and data
- Integrated backup battery for backing up the RAM and definable PLC operands
- Nonvolatile EPROM and EEPROM memories can be inserted as options
- Integrated programming interface in the form of a differential interface (RS422)
- Processing of the inputs and outputs in direct mode or as refresh mode

| Specifications | | | A1SHCPU | A2SHCPU | A2SHCPU-S1 |
|---|---|---|---|---|---|
| I/O points (internal) | | | 256 | 512 | 1024 |
| Total I/O points (with remote I/O units) | | | 2048 | 2048 | 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 | | |
| Battery buffer | | | All modules are fitted with a lithium-battery with a life expectancy of 5 years. | | |
| Memory type | | | RAM, EPROM, EEPROM | RAM, EPROM, EEPROM | RAM, EPROM, EEPROM |
| Program capacity ① | overall | kByte | 64 | 64 | 192 |
| | max. for PLC program | | 8 k steps | 14 k steps | 30 k steps |
| | max. for internal microcomputer program | kByte | 14 | 14 | 30 |
| Cycle time | | | 0.333 µs/log. instruction | 0.25 µs/log. instruction | 0.25 µs/log. instruction |
| Timer (T) | | | 256 | 256 | 256 |
| Counter (C) | | | 256 | 256 | 256 |
| Internal / special relay (M) | | | 2048 / 256 | 2048 / 256 | 2048 / 256 |
| Data register / special register (D) | | | 1024 / 256 | 1024 / 256 | 1024 / 256 |
| File register (R) ② | | | Max. 8192 | Max. 8192 | Max. 8192 |
| Interrupt pointer (I) | | | 32 | 32 | 32 |
| Pointer (P) | | | 256 | 256 | 256 |
| Annunciator (F) | | | 256 | 256 | 256 |
| Accumulator (A) | | | 2 | 2 | 2 |
| Index register (V, Z) | | | 2 | 2 | 2 |
| Link relay (B) / link register (W) | | | 1024 / 1024 | 1024 / 1024 | 1024 / 1024 |
| Comments ② | | | Max. 4032 | Max. 4032 | Max. 4032 |
| Instructions | | | 261 | 261 | 261 |
| Internal power consumption (5 V DC) | | mA | 300 | 400 | 400 |
| Max. compensation time at power failure | | ms | 20 | 20 | 20 |
| Weight | | kg | 0.33 | 0.33 | 0.33 |
| Dimensions (W x H x D) | | mm | 54.5 x 130 x 93.6 | 54.5 x 130 x 93.6 | 54.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 66612 | 66613 | 66611 |
| **Accessories** | | | Memory cassettes (refer to page 78) | | |

① Dependent on one another
② Number dependent on the memory configuration

## MELSEC AnS CPU Modules




### A2ASCPU(-S1), A2ASCPU-S30/-S60

In performance, the CPU types A2AS(-S1) correspond to the A1S/A2S(-S1) types. The A2ASCPU-S30/-S60 dispose of more program capacity and shorter cycle time.

The AnAS types are also particularly suitable for applications where short PLC cycle times are required.

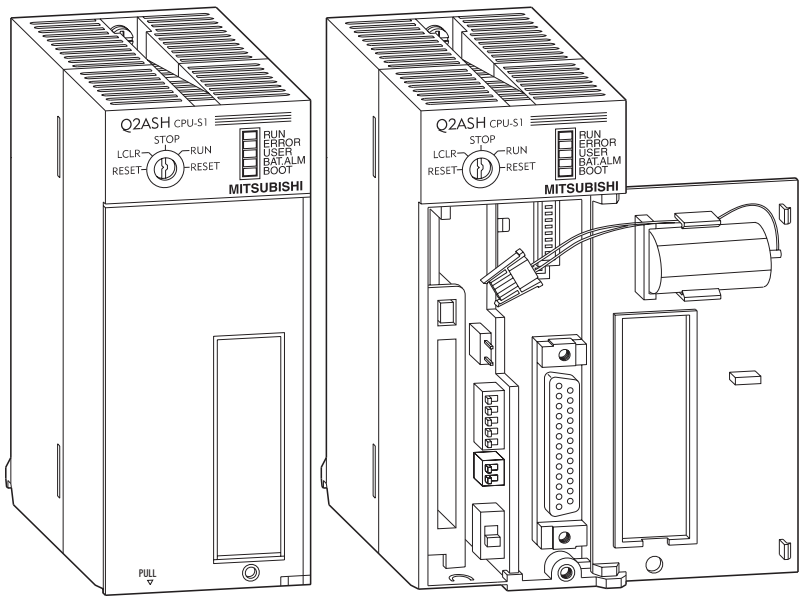
### Special features:

- 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

| Specifications | | | A2ASCPU | A2ASCPU-S1 | A2ASCPU-S30 | A2ASCPU-S60 |
|---|---|---|---|---|---|---|
| I/O points | | | 512 | 1024 | 1024 | 1024 |
| CPU self-diagnostic functions | | | CPU error detection, Watch Dog, battery error detection, memory error detection, program check, power supply error detection, fuse error detection | | | |
| Battery buffer | | | All modules are fitted with a lithium-battery with a life expectancy of 5 years. | | | |
| Memory type | | | RAM, EPROM, EEPROM | RAM, EPROM, EEPROM | RAM, EPROM, EEPROM | RAM, EPROM, EEPROM |
| Program capacity ① | overall | kByte | 64 | 256 | 256 | 256 |
| | max. for PLC program | | 14 k steps | 14 k steps | 30 k steps | 60 k steps |
| Cycle time | | | 0.2 µs/log. instruction | 0.2 µs/log. instruction | 0.15 µs/log. instruction | 0.15 µs/log. instruction |
| Timer (T) | | | 2048 | 2048 | 2048 | 2048 |
| Counter (C) | | | 1024 | 1024 | 1024 | 1024 |
| Internal / special relay (M) | | | 8192 / 256 | 8192 / 256 | 8192 / 256 | 8192 / 256 |
| Data register / special register (D) | | | 6144 / 256 | 6144 / 256 | 6144 / 256 | 6144 / 256 |
| File register (R) ② | | | Max. 8192 | Max. 8192 | Max. 8192 | Max. 8192 |
| Interrupt pointer (I) | | | 32 | 32 | 32 | 32 |
| Pointer (P) | | | 256 | 256 | 256 | 256 |
| Annunciator (F) | | | 2 048 | 2 048 | 2 048 | 2 048 |
| Accumulator (A) | | | 2 | 2 | 2 | 2 |
| Index register (V, Z) | | | 14 | 14 | 14 | 14 |
| Link relay (B) / link register (W) | | | 4096 / 4096 | 4096 / 4096 | 4096 / 4096 | 4096 / 4096 |
| Comments /expanded comments ② | | | Max. 4032 / max. 3968 | Max. 4032 / max. 3968 | Max. 4032 / max. 3968 | Max. 4032 / max. 3968 |
| Instructions | | | 463 | 463 | 463 | 463 |
| Internal power consumption (5 V DC) | | mA | 320 | 320 | 320 | 320 |
| Max. compensation time at power failure | | ms | 20 | 20 | 20 | 20 |
| Weight | | kg | 0.41 | 0.41 | 0.41 | 0.41 |
| Dimensions (W x H x D) | | mm | 54.5 x 130 x 93.6 | 54.5 x 130 x 93.6 | 54.5 x 130 x 93.6 | 54.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 38067 | 42615 | 56084 | 63884 |
| **Accessories** | | | Memory cassettes (refer to page 80) | | | |

① Independent
② Number depends on memory configuration

## ■ MELSEC QnAS CPU Modules




### Q2ASCPU(-S1), Q2ASHCPU(-S1)

These controllers make it possible to use small modular systems in complex production systems calling for short cycle times. These CPUs can also handle really large recipes, making them ideal for use in networks.

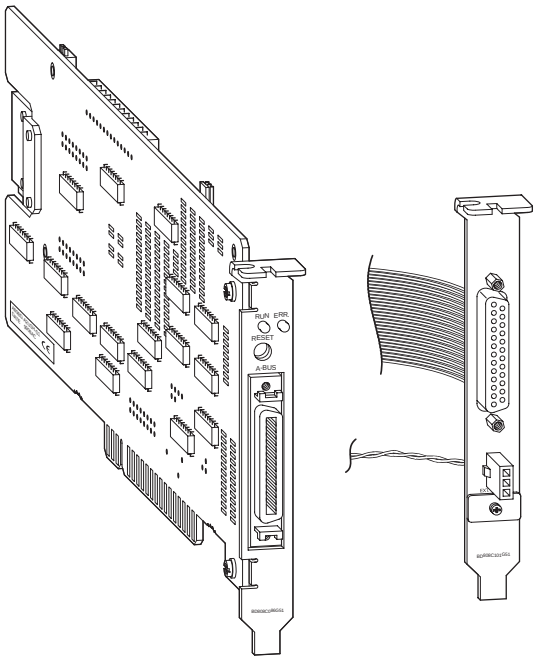
### Special features:

- Processing of inputs and outputs as process I/O image (direct processing instructions are available)
- IEEE 754 floating point maths
- Dedicated instructions for PID controller circuits
- Mathematical functions including trig, exponents and logarithms
- The CPU can store an entire controller cycle program including the graphical information. This means that the entire program information is available when you download the program from the CPU to the PC.

| Specifications | | | Q2ASCPU | Q2ASCPU-S1 | Q2ASHCPU | Q2ASHCPU-S1 |
|---|---|---|---|---|---|---|
| Max. I/O points overall | | | 8192 | 8192 | 8192 | 8192 |
| Max. I/O points on mounting rack | | | 512 | 1024 | 512 | 1024 |
| CPU self-diagnostic functions | | | Program plausibility, watchdog (time), battery check, memory test, CPU test, line voltage monitor, fuse test | | | |
| Battery buffer | | | All modules are fitted with a lithium-battery with a life expectancy of 5 years. | | | |
| Memory type | | | RAM, EEPROM | RAM, EEPROM | RAM, EEPROM | RAM, EEPROM |
| Program capacity ① | overall | kByte | 112 | 240 | 112 | 240 |
| | max. for PLC program | | 28 k steps | 60 k steps | 28 k steps | 60 k steps |
| Cycle period | | µs | LD: 0.20 / MOV: 0.60 | LD: 0.20 / MOV: 0.60 | LD: 0.075 / MOV: 0.225 | LD: 0.075 / MOV: 0.225 |
| Timers (T) | | | 2048 | 2048 | 2048 | 2048 |
| Counters (C) | | | 1024 | 1024 | 1024 | 1024 |
| Relays / special relays (M) | | | 8192 / 2048 | 8192 / 2048 | 8192 / 2048 | 8192 / 2048 |
| Data registers / special registers (D) | | | 12288 / 2048 | 12288 / 2048 | 12288 / 2048 | 12288 / 2048 |
| File registers (R) ③ | | | 1018 k words x 1 (PCMCIA memory card required. Number of file registers depends on capacity of PCMCIA memory card.) | | | |
| Interrupt pointer (I) | | | 48 | 48 | 48 | 48 |
| Pointer (P) | | | 4096 | 4096 | 4096 | 4096 |
| Annunciator (F) | | | 2048 | 2048 | 2048 | 2048 |
| Index register (Z) | | | 16 | 16 | 16 | 16 |
| Link relay (B) / link register (W) | | | 8192 / 8192 | 8192 / 8192 | 8192 / 8192 | 8192 / 8192 |
| Comments ② | | | Approx. 64 k (PCMCIA memory card required. Number of comments depends on capacity of PCMCIA memory card.) | | | |
| Instructions | | | Sequential: 39, others: 722 | Sequential: 39, others: 722 | Sequential: 39, others: 722 | Sequential: 39, others: 722 |
| Internal power consumption (5 V DC) | | mA | 300 | 300 | 700 | 700 |
| Max. compensation time at power failure | | ms | Depends on power supply unit used, see page 13. | | | |
| Weight | | kg | 0.5 | 0.5 | 0.5 | 0.5 |
| Dimensions (W x H x D) | | mm | 54.5 x 130 x 110 | 54.5 x 130 x 110 | 54.5 x 130 x 110 | 54.5 x 130 x 110 |
| **Order information** | | Art. no. | 61039 | 61031 | 61044 | 61045 |
| **Accessories** | | | Memory cards (refer to page 80) | | | |

① Interdependent
② Number depends on memory configuration

## ■ MELSEC Slot PLC



### PLC based controller

The slot PLC A80BDE-A2USH-S1 is a MELSEC CPU in the form of a PC slot-in board and is designed for the installation in a PC with the operating system MS Window NT (from version 4.0)

### Special features:

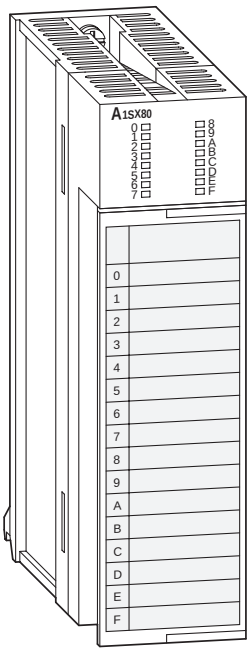
- 32 bit PCI board with 33 MHz bus clock rate
- Extension units with modules of the AnU/AnS series can be connected
- Installation software included when shipped
- Programmabel by MELSEC MEDOC *plus* and GPP/Win
- Access to devices of the CPU with the help of the programming languages Visual C++ or Visual Basic (from version 5)
- Extensive software package (see accessories in the table below)

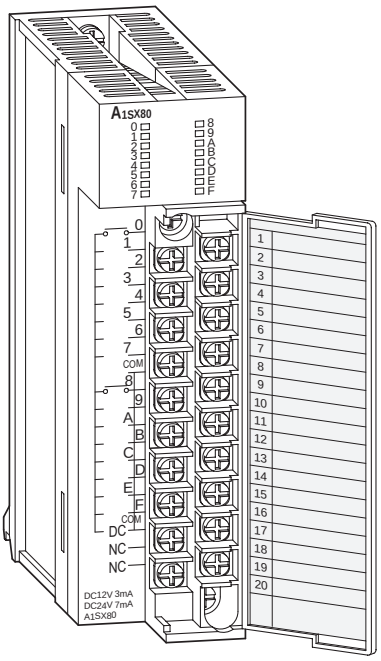
| Specifications | | | A80BDE-A2USH-S1 |
|---|---|---|---|
| Max. I/O points | | | 8192 total / 1024 on base unit (192 I/O points 00-BF used by the system) |
| CPU self-diagnostic functions | | | Program plausibility, Watch Dog (time), battery check, memory error detection, CPU error detection, power supply error detection, fuse test |
| Backup battery | | | The board is equipped with a lithium-battery with a durability of 5 years. |
| Memory type | | | RAM, EPROM |
| Program capacity ① | overall | kBytes | 448 |
| | max. for PLC program | | 30 k steps |
| Cycle time | | | 0.09 µs/log. instruction |
| Timer (T) | | | 2048 |
| Counter (C) | | | 1024 |
| Internal relay / special relay (M) | | | 8192 / 256 |
| Data register / special register (D) | | | 8192 / 256 |
| File register (R) ② | | | Max. 8192 |
| Interrupt pointer (I) | | | 32 |
| Pointer (P) | | | 256 |
| Annunciator (F) | | | 2048 |
| Accumulator (A) | | | 2 |
| Index register (V, Z) | | | 14 |
| Link relay (B) / link register (W) | | | 8192 / 8192 |
| Comments ② | | | Max. 4032 |
| Instructions | | | 462 |
| Internal current consumption | | A | Max. 2 |
| External voltage supply | | | +5 V DC (+-5%) |
| Weight | | kg | 0.5 |
| Dimension | | | Standard PCI board |

| | | |
|---|---|---|
| **Order information** | Art. no. | 129404 |
| **Accessories** | | Base driver software for CPU–PC communications: SW3D5F-CSKP-E, software tool for simple data exchange between CPU and MS-EXCEL: SW3D5F-OLEX-E, user programmable visualization package: SW3D5F-XMOP-E, memory cassette art. no.: 24706, 24746, 4103 |

① Dependent on one another
② Number dependent on the memory configuration

## ■ MELSEC AnS/QnAS Digital Input Modules




### Detection of process signals

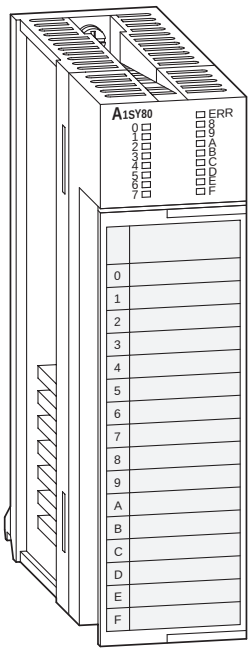
Various input modules are available for converting the digital process signals with different voltage levels into the levels required by the PLC.

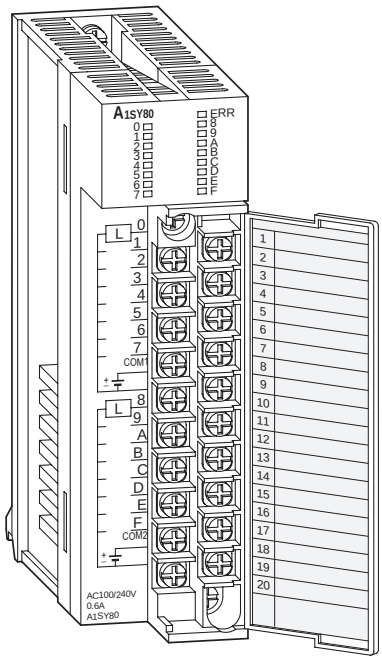
### Special features:

- The input points can be operated alternatively as positive or negative switching.
- 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.
- Modules with 32 connection points have a 37-pin D-sub plug (supplied with the module)
- Assembled cables are available for modules with D-sub plugs (A32CBL: 3 m).

| Specifications | | | A1SX10EU | A1SX20EU | A1SX80 | A1SX80-S1 | A1SX81 |
|---|---|---|---|---|---|---|---|
| Input points | | | 16 | 16 | 16 | 16 | 32 |
| Isolation method | | | Photocoupler isolation between input terminals and PC power for all modules. | | | | |
| Rated input voltage | | | 110 – 120 V AC (50 / 60 Hz) | 200 – 240 V AC (50 / 60 Hz) | 12 / 24 V DC | 24 V DC | 12 / 24 V DC |
| Operating voltage range | | | AC 85 – 132 V AC | 170 – 264 V AC | — | — | — |
| Max. simultaneously ON | | | 100 % | 60 % (at 220 V AC) | 100 % (at 26.4 V DC) | 100 % (at 26.4 V DC) | 60 % (at 26.4 V DC) |
| Inrush current | | | 200 mA for 1 ms (at 132 V AC) | 500 mA for 1 ms (at AC 264 V) | — | — | — |
| Rated input current | | mA | 7 mA (at 120 V AC, 60 Hz) | ca. 11 (at 240 V AC, 60 Hz) | ca. 3 / ca. 7 | ca. 7 | ca. 3 / ca. 7 |
| ON | voltage | V | ≥ AC 80 | ≥ AC 80 | ≥ DC 8 | ≥ DC 17 | ≥ DC 8 |
| | current | mA | ≥ AC 5 | ≥ AC 4 | ≥ DC 2 | ≥ DC 5 | ≥ DC 2 |
| OFF | voltage | V | ≤ AC 30 | ≤ AC 30 | ≤ DC 4 | ≤ DC 5 | ≤ DC 4 |
| | current | mA | ≤ AC 1 | ≤ AC 1 | ≤ DC 1 | ≤ DC 1.7 | ≤ DC 1 |
| Load resistance | | kΩ | ca. 21 (50 Hz) / ca. 18 (60 Hz) | ca. 27 (50 Hz) / ca. 22 (60 Hz) | ca. 3.3 | ca. 3.3 | ca. 3.3 |
| Response time | OFF ⟶ ON | ms | ≤ 20 (100 V AC, 60 Hz) | ≤ 30 (200 V AC, 60 Hz) | ≤ 10 (24 V DC) | ≤ 0,4 (24 V DC) | ≤ 10 (12 / 24 V DC) |
| | ON ⟶ OFF | ms | ≤ 35 (100 V AC, 60 Hz) | ≤ 55 (200 V AC, 60 Hz) | ≤ 10 (24 V DC) | ≤ 0,5 (24 V DC) | ≤ 10 (12 / 24 V DC) |
| Common terminal arrangement | | | 16 | 16 | 16 | 16 | 32 |
| Power indicator | | | All modules possess a status LED per input/output. | | | | |
| Connection terminal | | | 20-point removable terminal block | 20-point removable terminal block | 20-point removable terminal block | 20-point removable terminal block | Compact plug type 37 D-Sub |
| No. of occupied I/O points | | | 16 | 16 | 16 | 16 | 32 |
| Applicable wire size | | $mm^2$ | 0.75 – 1.5 | 0.75 – 1.5 | 0.75 – 1.5 | 0.75 – 1.5 | 0.3 |
| Internal power consumption (5 V DC) | | mA | 50 (all input points ON) | 50 (all input points ON) | 50 (all input points ON) | 50 (all input points ON) | 80 (all input points ON) |
| Weight | | kg | 0.21 | 0.23 | 0.2 | 0.2 | 0.24 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 54914 | 53665 | 24973 | 31536 | 24974 |
| **Accessories** | | | — | — | — | — | Adapter cable (see page 77) |
| **Spare parts** | | | 20-point removable terminal block and cover: A1STEC-S, art. no. 31248 | | | | |

## MELSEC AnS/QnAS Digital Output Modules




### Adapted output technology

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

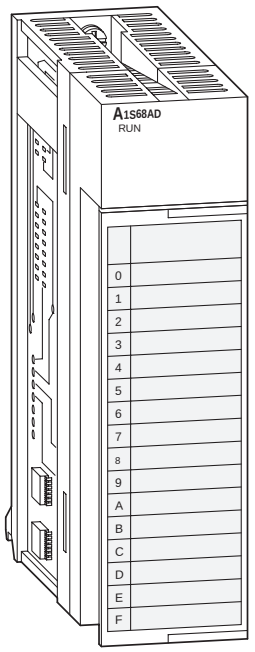
### Special features:

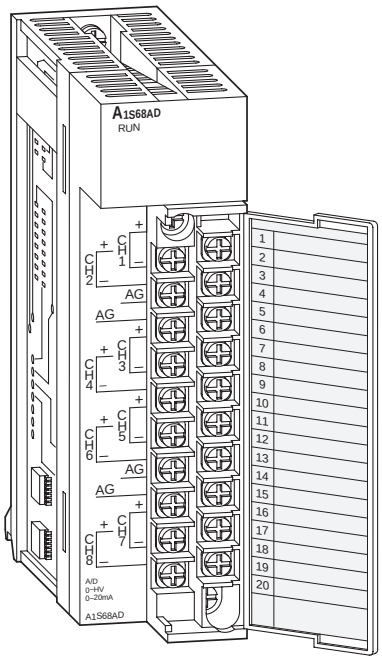
- Output modules with relay, transistor or triac switches
- Potential isolation between process and control by means of an optocoupler is a standard feature
- Modules with potential isolation between the channels
- Modules with 16 protection points have removable terminal blocks with screws
- Modules with 32 connection points have a 37-pin D-sub plug (supplied with the module)
- Assembled cables are available for the modules with D-sub plugs (A32CBL: 3 m)

| Specifications | | | A1SY10EU | A1SY14EU | A1SY18AEU | A1SY22① | A1SY28EU | A1SY68A | A1SY80 | A1SY81 |
|---|---|---|---|---|---|---|---|---|---|---|
| Outputs | | | 16 | 12 | 8 | 16 | 8 | 8 | 16 | 32 |
| Output type | | | Relay | Relay | Relay | Triac | Triac | Transistor | Transistor | Transistor |
| Common terminal arrangement | | points | 8 | 4 | 1 | 8 | 4 | 1 | 8 | 32 |
| Isolation method | | | Photocoupler isolation between output terminals and PC power for all modules. | | | | | | | |
| Rated output voltage | | | 24 V DC / 120 V AC | 24 V DC / 240 V AC | 24 V DC / 240 V AC | 100 – 240 V AC | 100 – 240 V AC | 5 / 12 / 24 / 48 V DC | 12 / 24 V DC | 12 / 24 V DC |
| Operating voltage range | | | — | — | — | — | — | 4.5 – 52.8 V DC | 10.2 – 30 V DC | 10.2 – 30 V DC |
| Min. switching load | | | 5 V DC (1 mA) | 5 V DC (1 mA) | 5 V DC (1 mA) | 24 V AC (100 mA)<br>100 V AC (10 mA)<br>240 V AC (20 mA) | 24 V AC (15 mA)<br>100 V AC (15 mA)<br>240 V AC (15 mA) | — | — | — |
| Max. switching voltage | | | 125 V DC / 132 V AC | 125 V DC / 264 V AC | 125 V DC / 264 V AC | 264 V AC | 264 V AC | — | — | — |
| Max. output current | | A | 2 | 2 | 2 | 0.6 | 0.6 | 2 | 0.8 | 0.1 |
| Output current per group TYP. | | A | 8 | 8 | 2 | 2.4 | 1.9 | 2 | 3.2 | 2 |
| Inrush current | | | — | — | — | 20 A for 10 ms,<br>8 A for 100 ms | 30 A for 10 ms,<br>15 A for 100 ms | 8 A for 10 ms | 8 A for 10 ms | 0.4 A for 10 ms |
| Leakage current at OFF | | mA | — | — | — | 1.5 mA (120 V AC),<br>3 mA (240 V AC) | 1.5 mA<br>(240 V AC / 60 Hz) | 0.1 | 0.1 | 0.1 |
| Response time | OFF ⟶ ON | ms | 10 | 10 | 10 | 1 | 1 | 3 | 2 | 2 |
| | ON ⟶ OFF | ms | 12 | 12 | 12 | 0.5 period +1 ms | 0.5 period +1 ms | 10 | 2 | 2 |
| Life | mechanical | | Switching 20 million times | | | — | — | — | — | — |
| | electrical | | Switching 100000 times or more | | | — | — | — | — | — |
| Max. switching frequency | | | Switching 3600 times/h | | | — | — | — | — | — |
| Noise suppression | | | — | — | — | CR (0.01µF,47Ω) | CR (0.01µF,47Ω) | Zener diode | Zener diode | Zener diode |
| Fuse | | A | — | — | — | 5 | — | — | 5 | 3,2 |
| Power indicator | | | All modules possess a status LED per output. | | | | | | | |
| Fuse blown indicator | | | — | — | — | LED | — | — | LED | LED |
| Connection terminal | | | 20-point removable terminal block | | | | | | | D-Sub plug |
| No. of occupied I/O points | | | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 32 |
| Applicable wire size | | $mm^2$ | 0.75 – 1.5 | 0.75 – 1.5 | 0.75 – 1.5 | 0.75–1.5 | 0.75–1.5 | 0.75 – 1.5 | 0.75 – 1.5 | 0.3 |
| Ext. power supply req. | voltage | mA | 90 | 100 | 75 | 2 | — | — | 20 | 8 |
| | current | | 24 V DC, ±10 % | 24 V DC, ±10 % | 24 V DC, ±10 % | 100 – 240 V AC | 240 V AC | — | 12/24 V DC | 12/24 V DC |
| Internal power consumption (5 V DC) | | mA | 120 | 120 | 240 | 270 | 270 | 110 | 120 | 500 |
| Weight | | kg | 0.25 | 0.25 | 0.25 | 0.24 | 0.24 | 0.2 | 0.2 | 0.23 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 53666 | 54349 | 53667 | 24976 | 54348 | 33199 | 24977 | 24978 |
| **Accessories** | | | — | — | — | — | — | — | — | Adapter cable |

① Does not comply to CE standard

## MELSEC AnS/QnAS Analog Input Modules




### Detection of analog process signals

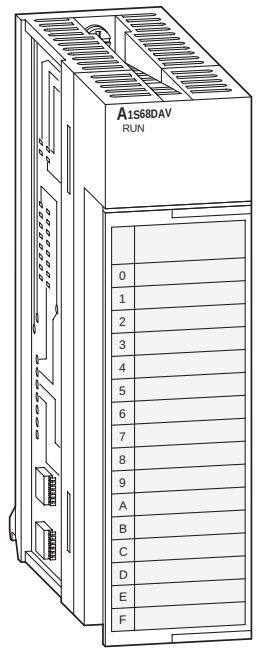
The analog input modules convert analog process signals, for example pressure, flow or fill level, linearly into digital values, which are further processed by the AnS/QnAS CPU.

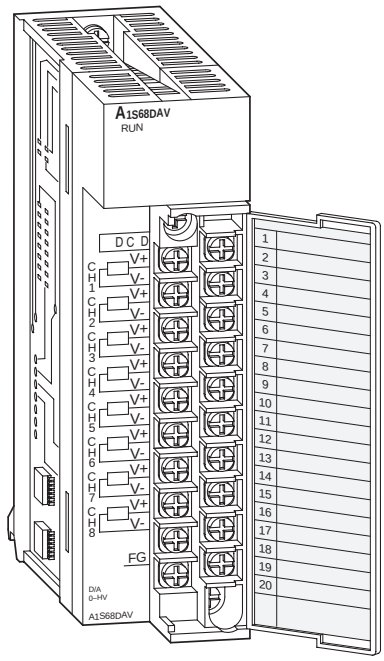
### Special features:

- Up to 8 channels per module (A1S68AD) and up to 256 channels per system (A2SCPU-S1/ A2ASCPU-S1/-S30/-S60)
- Resolution of 0.83 mV and 3.33 µA (A1S64AD)
- Conversion time of 0.5 msec./channel (A1S68AD)
- 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.
- The module is provided with a removable terminal block fastened with screws.

| Specifications | | | A1S64AD | | | | | A1S68AD | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Input points | | | 4 | | | | | 8 | | |
| Analog input | | | -10 V / +10 V (-20 mA / +20 mA) | | | | | -10 V / +10 V (0 mA / +20 mA) | | |
| Resolution | | | 16 bits binary (incl. sign) | | | | | 16 bits binary (incl. sign) | | |
| Load resistance | voltage | MΩ | 1 | | | | | 1 | | |
| | current | Ω | 250 | | | | | 250 | | |
| Max. input | voltage | V | ±15 | | | | | ±35 | | |
| | current | mA | ±30 | | | | | ±30 | | |
| I/O characteristics | | | **Analog input** | | **Digital output** | | | **Analog input** | | **Digital output** |
| | | | Voltage | Current | 1/4000 | 1/8000 | 1/12000 | Voltage | Current | |
| | | | +10 V<br>+5 V<br>0 V<br>-5 V<br>-10 V | +20 mA<br>0 mA<br>- 20 mA | 4000<br>2000<br>0<br>-2000<br>-4000 | 8000<br>4000<br>0<br>-4000<br>-8000 | 12000<br>6000<br>0<br>-6000<br>-12000 | 0 – +10 V<br>-10 – +10 V<br>0 – +5 V<br>1 – +5 V | 0 – 20 mA<br>4 – 20 mA | 0 – +4000<br>-2000 – +2000<br>0 – +4000<br>0 – +4000 |
| Max. resolution | resolution | | | | 1/4 000 | 1/8000 | 1/12000 | | | |
| | voltage input | | | | 2.5 mV | 1.25 mV | 0.83 mV | 0 – +10 V<br>-10 – +10 V<br>0 – +5 V<br>1 – +5 V | | 2.5 mV<br>5 mV<br>1.25 mV<br>1 mV |
| | current input | | | | 10 µA | 5 µA | 3.33 µA | 0 – 20 mA<br>4 – 20 mA | | 5 µA<br>4 µA |
| Overall accuracy | | | ±1.0 % (for the whole measurement range) | | | | | ±1.0 % (for the whole measurement range) | | |
| Max. conversion time | | ms/ channel | 20 | | | | | 0.5 | | |
| Isolation method | | | Photocoupler isolation between output terminals and PC power for all modules. | | | | | | | |
| I/O points | | | 32 | | | | | 32 | | |
| Connection terminal | | | All modules are fitted with a terminal block with 20 screw terminals. | | | | | | | |
| External power consumption | | | Not neccessary for both modules | | | | | | | |
| Applicable wire size | | $mm^2$ | 0.75 – 1.5 | | | | | 0.75 – 1.5 | | |
| Internal power consumption (5 V DC) | | mA | 400 | | | | | 400 | | |
| Weight | | kg | 0.25 | | | | | 0.27 | | |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 | | | | | 34.5 x 130 x 93.6 | | |
| **Order information** | | Art. no. | 25707 | | | | | 46478 | | |

## MELSEC AnS/QnAS Analog Output Modules




### Output of analog control signals

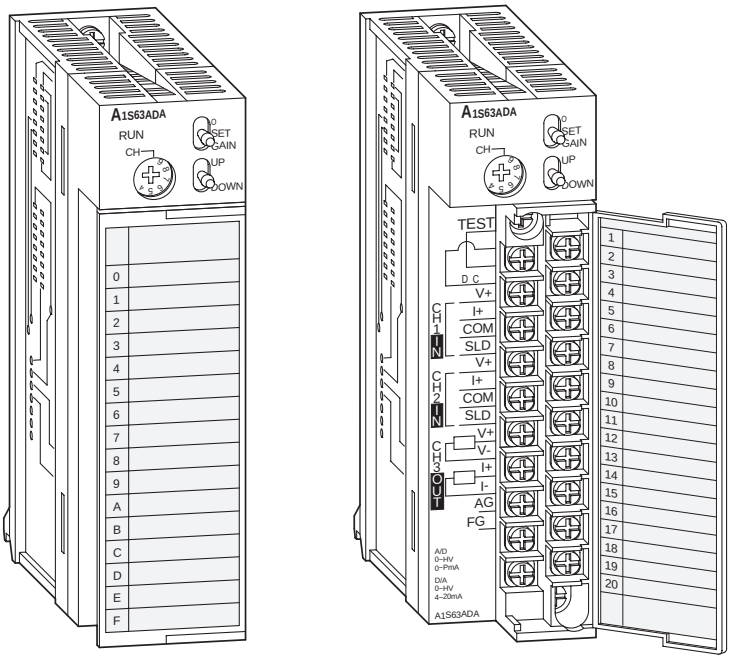
The analog output modules convert digital values predetermined by the CPU into an analog current or voltage signal. For example, frequency inverters, valves or slide valves are controlled by means of these signals.

### Special features:

- Up to 8 channels per module (A1S68DAV/DAI) and up to 256 channels per system (A2SCPU-S1/ A2ASCPU-S1/-S30/-S60)
- Resolution of 0.83 mV and 1.7 µA (A1S62DA)
- Conversion time of 4 msec. / 8 channels (A1S68DAV/DAI)
- Potential isolation between process and control by means of an optocoupler is a standard feature.
- The module is provided with a removable terminal block fastened with screws.

| Specifications | | A1S62DA | | | | A1S68DAV | | A1S68DAI | |
|---|---|---|---|---|---|---|---|---|---|
| Output points | | 2 | | | | 8 | | 8 | |
| Digital input | | -4000 – +4000<br>-8000 – +8000<br>-12000 – +12000 | | | | -2048 – +2047 | | 0 – +4096 | |
| Analog output | | -10 V DC – +10 V DC (0 mA – +20 mA DC) | | | | -10 V DC – +10 V DC | | 4 mA – +20 mA DC | |
| Load resistance | voltage | 2 kΩ – 1 MΩ | | | | 2 kΩ – 1 MΩ | | — | |
| | current | 0 – 600 Ω | | | | — | | 0 – 600 Ω | |
| **Voltage output** | | | | | | | | | |
| I/O characteristics | digital input | 1/4000 | 1/8000 | 1/12000 | **Voltage output** | | **Voltage output** | | |
| | | 4000<br>2000<br>0<br>-2000<br>-4000 | 8000<br>4000<br>0<br>-4000<br>-8000 | 12000<br>6000<br>0<br>-6000<br>-12000 | +10 V<br>+5 V<br>0 V<br>-5 V<br>-10 V | 2000<br>1000<br>0<br>-1000<br>-2000 | +10 V<br>+5 V<br>0 V<br>-5 V<br>-10 V | — | — |
| Max. resolution | | 2.5 mV | 1.25 mV | 0.83 mV | (10 V) | 5 mV | — | — | — |
| **Current output** | | | | | | | | | |
| I/O characteristics | digital input | 1/4000 | 1/8000 | 1/12000 | **Current output** | — | — | | **Currrent output** |
| | | 4000<br>2000<br>0 | 8000<br>4000<br>0 | 12000<br>6000<br>0 | 20 mA<br>12 mA<br>4 mA | | | 4000<br>2000<br>0 | 20 mA<br>12 mA<br>4 mA |
| Max. resolution | | 5 µA | 2.5 µA | 1.7 µA | (20 mA) | — | — | 4 µA | |
| Overall accuracy | | ±1.0 %<br>(for the whole measurement range) | | | | ±1.0 %<br>(for the whole measurement range) | | ±1.0 %<br>(for the whole measurement range) | |
| Max. conversion time | | 25 ms / 2 channels (or 1 channel) | | | | 4 ms / 8 channels | | 4 ms / 8 channels | |
| Isolation method | | Photocoupler isolation between output terminals and PC power for all modules. | | | | | | | |
| I/O points | | 32 | | | | 32 | | 32 | |
| Connection terminal | | All modules are fitted with a terminal block with 20 screw terminals. | | | | | | | |
| Applicable wire size | $mm^2$ | 0.75 – 1.5 | | | | 0.75 – 1.5 | | 0.75 – 1.5 | |
| Internal power consumption (5 V DC) | mA | 800 | | | | 650 | | 850 | |
| Weight | kg | 0.32 | | | | 0.28 | | 0.28 | |
| Dimensions (W x H x D) | mm | 34.5 x 130 x 93.6 | | | | 34.5 x 130 x 93.6 | | 34.5 x 130 x 93.6 | |
| **Order information** | Art. no. | 25709 | | | | 46475 | | 46477 | |

## MELSEC AnS/QnAS Analog Input/Output Modules




### Analog modules with inputs and outputs

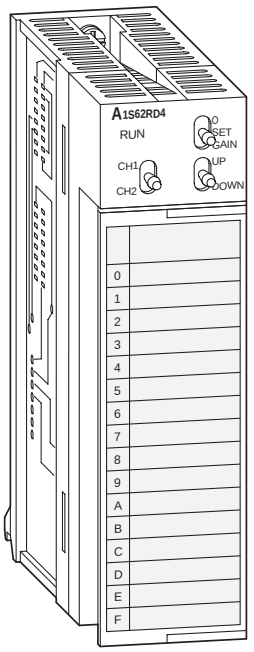
These modules have both analog inputs and one or two analog outputs. Individual channels operate autonomously but can also be coupled to one another.

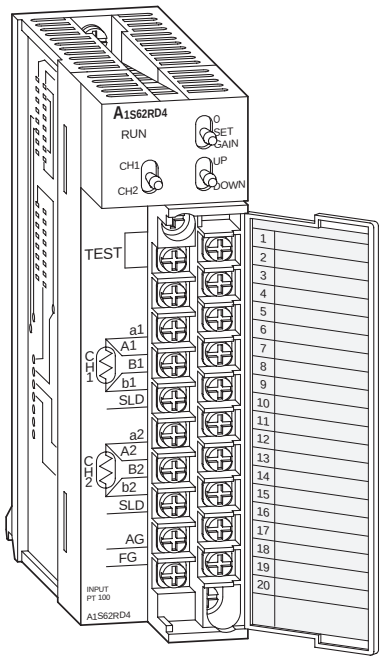
### Special features:

- 2 or 4 analog input points and 1 or 2 analog output points
- Resolution of 0.83 mV and 3.3 µA (input)/ 1.7 µA (output)
- Extremely short processing time due to high-speed conversion with the A1S66ADA
- Linkage of input/output via formulae or X/Y graph
- Potential isolation between process and control by means of an optocoupler is a standard feature.
- The modules are provided with a removable terminal block fastened with screws.

| Specifications | | A1S63ADA | A1S66ADA |
|---|---|---|---|
| **A/D conversion** | | | |
| Analog input | | -10 V DC – +10 V DC (-20 mA – +20 mA DC) | -10 – 0 – +10 V DC (0 – 20 mA DC) |
| Resolution | | -4096 – +4095 (1/4000), -8192 – +8191 (1/8000), -12288 – +12287 (1/12000) | 0 – 4095 (12 bit binary) |
| I/O characteristics | | **Analog input**: -10 – +10 V; -20 – 20 mA; **Digital output**: -4000 – 4000; -8000 – 8000; -12000 – 12000; -2000 – 2000; -4000 – 4000; -6000 – 6000 | **Analog input**: 0 – 10 V; 0 – 5 V; 1 – 5 V; -10 – 10 V; 0 – 20 mA; 4 – 20 mA; **Digital output**: 0 – 4095 |
| Max. resolution | voltage input | 0.83 mV (at resolution 1/12000) | 1 mV (for analog input range from 1 to 5 V) |
| | current input | 3.3 µA (at resolution 1/12000) | 4 µA (for analog input range from 4 to 20 mA) |
| Overall accuracy | | ±1.0 % | ±1.0 % |
| Max. conversion time | | 1 ms/channel (at 1/4000); 2 ms/channel (at 1/8000); 3 ms/channel (at 1/12000) | ≤400 µs (for 4 channels); scan time 80 µs (for 1 channel) |
| Absolute max. input | | Voltage: ±15 V, current: ±30 mA | Voltage: ±15 V, current: ±30 mA |
| Analog input points | | 2 | 4 |
| **D/A conversion** | | | |
| Digital input | | -4000 – +4000 (1/4000), -8000 – +8000 (1/8000), -12000 – +12000 (1/12000) 0 – +4000 (1/4000), 0 – +8000 (1/8000), 0 – +12000 (1/12000)) | 0 – 4000 (12 bit binary) |
| Analog output | | -10 V – +10 V (0 – +20 mA DC) | -10 – 0 – 10 V DC (0 – 20 mA DC) |
| I/O characteristics | | **Digital input**: -4000 – 4000; -8000 – 8000; -12000 – 12000; -2000 – 2000; -4000 – 4000; -6000 – 6000; **Analog output**: -10 – +10 V; 4 – 20 mA | **Digital input**: 0 – 4000; **Analog output**: 0 – 10 V; 0 – 5 V; 1 – 5 V; -10 – 10 V; 0 – 20 mA; 4 – 20 mA |
| Max. resolution | voltage input | 0.83 mV (at resolution 1/12.000) | 1 mV (for analog input range from 1 to 5 V) |
| | current input | 1.7 µA (at resolution 1/12.000) | 4 µA (for analog input range from 4 to 20 mA) |
| Overall accuracy | | 1.0 % (to the maximum value) | 1.0 % (to the maximum value) |
| Max. conversion time | | 1 ms (1/4000), 2 ms (1/8000), 3 ms (1/12000) | ≤240 µs (for 2 channels); scan time 80 µs (for 1 channel) |
| Absolute max. output | | Voltage: ±12 V, current: ±28 mA | Voltage: ±12 V, current: ±28 mA |
| Analog output points | | 1 | 2 |
| Isolation method | | Photocoupler isolation between output terminals and PC power. | Photocoupler isolation between output terminals and PC power. |
| I/O points | | 32 | 64 |
| Connection terminal | | The module is fitted with a terminal block with 20 screw terminals. | The module is fitted with a terminal block with 20 screw terminals. |
| Applicable wire size | $mm^2$ | 0.75 – 1.5 | 0.75 – 1.5 |
| Internal power consumption (5 V DC) | mA | 800 | 210 |
| Weight | kg | 0.3 | 0.33 |
| Dimensions (W x H x D) | mm | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |
| **Order information** | Art. no. | 36251 | 70543 |

## MELSEC AnS/QnAS Analog Modules for Pt100-Elements




### Temperature measurement by resistance thermometer

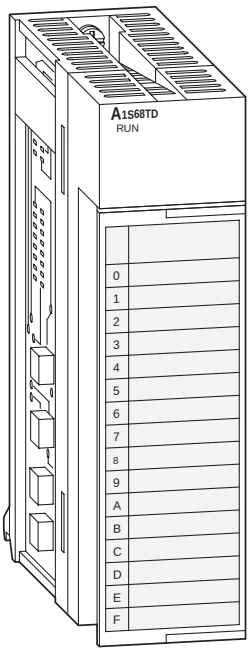
These analog modules are used for direct connection of Pt100 resistance thermometers. The measurement is based on the three-conductor or four-conductor method.

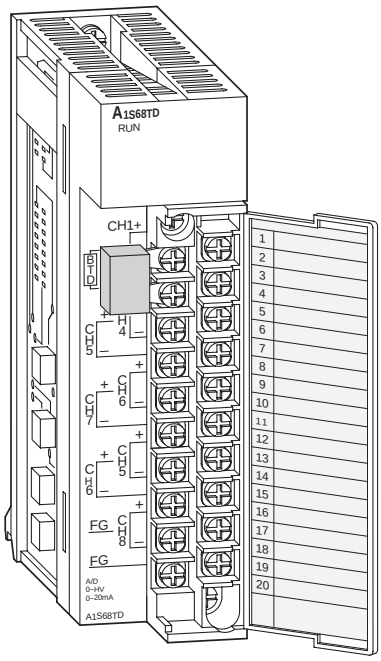
### Special features:

- Linearized measuring range from -180 °C to 600 °C
- Pt100 elements according to DIN and JIS are supported.
- A cable break is indicated to the CPU by the module.
- 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.
- The module is provided with a removable terminal block fastened with screws.

| Specifications | | A1S62RD3 | A1S62RD4 |
|---|---|---|---|
| Method of measurement | | 3-wire type | 4-wire type |
| Pt100-input points | | 2 | 2 |
| Connectable temperature measuring resistants | type | Pt100 (conforms to JIS C 1604-1989 and DIN IEC 751), JPt100 (conforms to JIS C 1604-1981) | |
| Temperature input range | °C | Pt 100: -180 – 600 (27.08 Ω – 313.59 Ω), JPt 100: -180 – 600 (25.8 Ω – 317.28 Ω) | |
| Detected temperature value | | 16 bits signed binary: -1800 – +6000<br>32 bits signed binary: -180000 – +600000 | 16 bit signed binary: -1800 – +6000<br>32 bit signed binary: -180000 – +600000 |
| Max. resolution | °C | 0.025 | 0.025 |
| Overall accuracy | | ±1 % (to the maximum value) | ±1 % (to the maximum value) |
| Max. conversion time | | 40 ms per channel ON | 40 ms per channel ON |
| Isolation method | | No isolation between channels. Photocoupler isolation between input terminal and PC CPU power. | |
| I/O points | | 32 | 32 |
| Connection terminal | | All modules are fitted with a terminal block with 20 screw terminals. | |
| Applicable wire size | $mm^2$ | 0.75 – 2 | 0.75 – 2 |
| Internal power consumption (5 V DC) | mA | 540 | 440 |
| Weight | kg | 0.29 | 0.28 |
| Dimensions (W x H x D) | mm | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |
| **Order information** | Art. no. | 25710 | 25712 |

## MELSEC AnS/QnAS Analog Module for Temperature Measurement




### Temperature measurement by thermocouple

This module is used for temperature measurement by means of a thermocouple. The reference temperature is determined by means of a Pt100 resistance thermometer.

### Special features:

- The module has 8 thermocouple inputs and a Pt100 input for the reference temperature.
- Linearized measuring range up to 1700 °C (thermocouple-dependent)
- The thermocouple types B, R, S, K, E, J and T with the thermoelectric voltage curves according to DIN IEC 584-1 are supported.
- Potential isolation between process and control by means of an optocoupler is a standard feature.
- The module is provided with a removable terminal block fastened with screws.

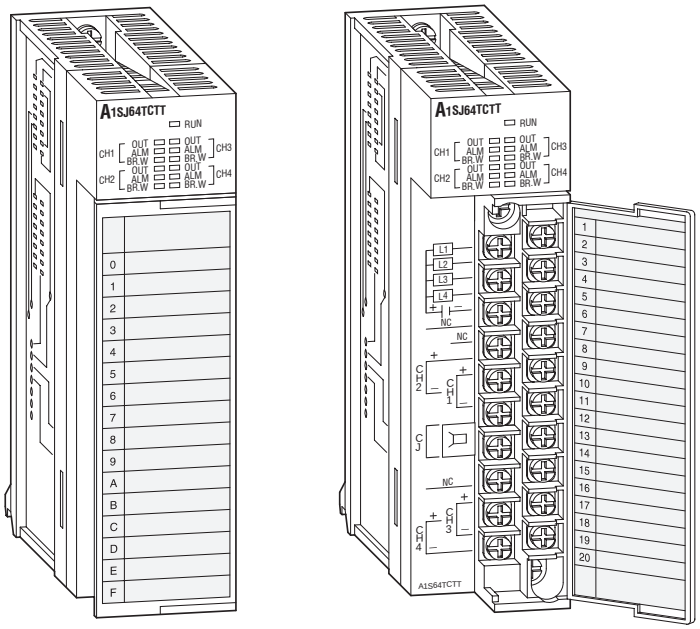
| Specifications | | A1S68TD | | | |
|---|---|---|---|---|---|
| Input points | | 8 | | | |
| Temperature input range | °C | 0 – 1 700 | | | |
| Detected temperature value | | 16 bits signed binary: 0 – 17000 (value to the first decimal place x 10) | | | |
| Scaling value | °C | 16 bits signed: 0 – +2000 | | | |
| Thermocouple | | **Type** | **Temperature measurement range** | **Conversion accuracy** (at operating ambient temperature is Ta = 25 ± 5°C) | **Temperature characteristic** (when operating ambient temperature varies by ΔT = 1 °C) |
| | | B | 800 – 1700 °C | ±2.5 °C | ±0.4 °C |
| | | R | 300 – 1600 °C | ±2 °C | ±0.3 °C |
| | | S | 300 – 1600 °C | ±2 °C | ±0.3 °C |
| | | K | 0 – 1200 °C | ±0.5 °C or 0.25 % of the measured temperature which ever is larger | ±0.07 °C or 0.02 % of the measured temperature which ever is larger |
| | | E | 0 – 800 °C | | |
| | | J | 0 – 750 °C | | |
| | | T | 0 – 350 °C | | |
| Cold junction compensation accuracy | | ±1 °C | | | |
| Overall accuracy | | (Conversion accuracy Ta) + (temperature characteristic) x (operating ambient temperature variation) ± 1 °C * | | | |
| Max. resolution | | B, R, S: 0.3 °C<br>K, E, J, T: 0.1 °C | | | |
| Max. conversion time | | 400 ms / 8 channels, without respect to the number of used channels | | | |
| Absolute max. input voltage | V | ± 5 | | | |
| Isolation method | | Transformer | | | |
| I/O points | | 32 | | | |
| Connection terminal | | The module is fitted with a terminal block with 20 screw terminals. | | | |
| Applicable wire size | $mm^2$ | 0.75 – 1.5 | | | |
| Internal power consumption (5 V DC) | mA | 320 | | | |
| Weight | kg | 0.28 | | | |
| Dimensions (W x H x D) | mm | 34.5 x 130 x 93.6 | | | |

| **Order information** | Art. no. | 46476 |
|---|---|---|

* Example:
Overall accuracy = (conversion accuracy at Ta = 25 °C ±5 °C) + (temperature characteristic by ΔT = 1 °C) x (operating ambient temperature variation) + (± 1 °C)
Example for thermocouple type 3 when the operating ambient temperature is 35 °C = (±2.5 °C) + (±0.4 °C) x (5 °C) + (±1 °C) = ±5.5 °C

Ta = operating ambient temperature
ΔT = operating ambient temperature variation

## MELSEC AnS/QnAS Temperature Control Modules




### Temperature control modules with PID algorithm

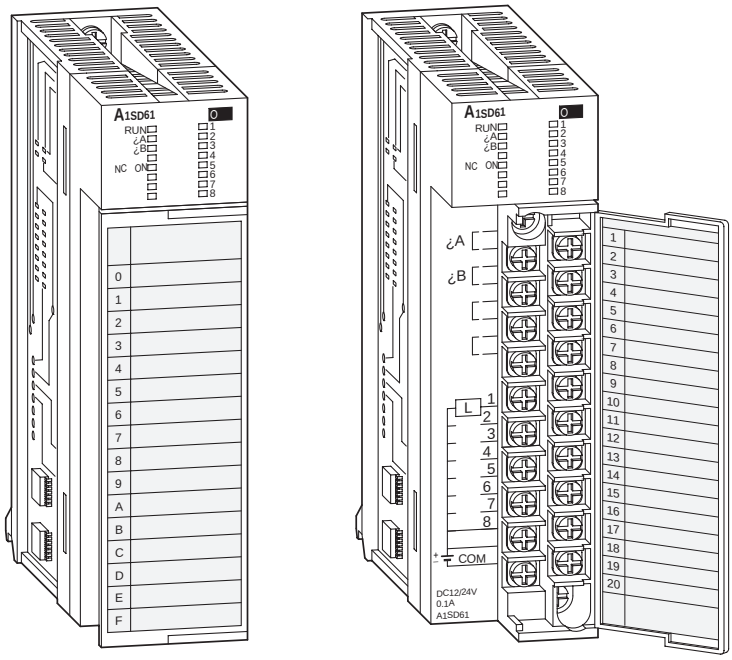
These modules enable PID algorithm temperature control without placing any load on the PLC CPU for the temperature control tasks.

### 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 | | | A1S64TCRT-S1 | A1S64TCTT-S1 |
|---|---|---|---|---|
| Control output | | type | Transistor | Transistor |
| Inputs | | | 4 channels per module | 4 channels per module |
| 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 |
| Control output cycle | | s | 1 – 100 | 1 – 100 |
| Input filter | | | 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 – 100.0 % (0 %: 2-position control) | 0.0 – 1000.0 % (0 %: 2-position control) |
| | integral constant I | | 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) |
| 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 % |
| Transistor output | output signal | | ON/OFF pulse | ON/OFF pulse |
| | rated load voltage | | 10.2 – 30 V DC | 10.2 – 30 V DC |
| | max. load current | | 0.1 mA/1 point, 0.4 mA/common | 0.1 mA/1 point, 0.4 mA/common |
| | max. rush current | | 400 mA for 10 ms | 400 mA for 10 ms |
| | max. voltage drop when ON | | 0.1 V DC (TYP) 0.1 A<br>2.5 V DC (MAX) 0.1 A | 0.1 V DC (TYP) 0.1 A<br>2.5 V DC (MAX) 0.1 A |
| | response time | | OFF → ON: < 2 ms<br>ON → OFF: < 2 ms | OFF → ON: < 2 ms<br>ON → OFF: < 2 ms |
| Isolation method | | | Transformer | Transformer |
| I/O points | | | 32 | 32 |
| Connection terminals | | | The module is fitted with a terminal block with 20 screw terminals. | The module is fitted with a terminal block with 20 screw terminals. |
| Applicable wire size | | $mm^2$ | 0.75 – 1.5 | 0.75 – 1.5 |
| Internal power consumption (5 V DC) | | mA | 330 | 420 |
| Weight | | kg | 0.27 | 0.3 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 126507 | 66227 |

## MELSEC AnS/QnAS High-Speed Counter Modules




### High-speed counter with automatic detection of rotation direction

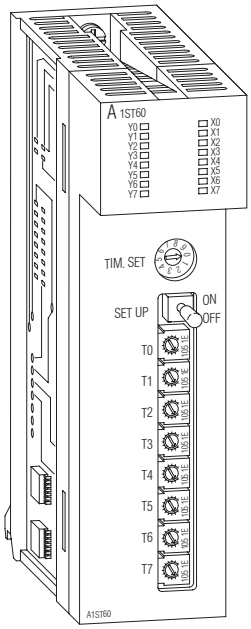
These counter modules detect signals with a frequency which cannot be detected by normal input modules. For example, simple positioning tasks or frequency measurements can be realized.

### 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 module is provided with a removable terminal block fastened with screws.

| Specifications | | | A1SD61 | A1SD62E |
|---|---|---|---|---|
| Counter inputs | | | 1 for incremental rotary transducer | 2 |
| Signal levels | | | 5 / 12 / 24 V DC (2 – 5 mA) | 5 / 12 / 24 V DC ( 2 – 5 mA) |
| Max. counting frequency | | kHz | 50 | 100 |
| Max. counting speed | 1-phase-input | kHz | 50 or 10 | 100 or 10 |
| | 2-phase-input | kHz | 50 or 7 | 100 or 7 |
| Counting range | | | 31 bits + sign (binary), -2147483648 – +2147483647 | 23 bits + sign (binary), 0 – 16777215 |
| Counter type | | | Both modules are equipped with UP/DOWN preset counter and ring counter function. | |
| Comparison range | | | 31 bits + sign (binary) | 24 bits + sign (binary) |
| External digital input points | | | Preset, function start | Preset, function start |
| Rated voltage/current for external input | | | 5 / 12 / 24 V DC (3 – 6 mA) | 5 / 12 / 24 V DC (2 – 5 mA) |
| External digital output points (Coincidence signal) | | | 8 transistor outputs (open collector) 12 / 24 V DC, 0.1 A/point, 0.8 A/common | 4 transistor outputs (2/point) (source type) 12 / 24 V DC, 0.1 A/point, 0.4 A/common |
| I/O points | | | 32 | 32 |
| Connection terminal | | | All modules are fitted with a detachable terminal block with 20 screw terminals. | |
| Applicable wire size | | $mm^2$ | 0.75 – 1.5 | 0.75 –1.5 |
| Internal power consumption (5 V DC) | | mA | 350 | 100 |
| Weight | | kg | 0.27 | 0.25 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 25713 | 54951 |

## MELSEC AnS/QnAS Timer Module




### Set timers directly without any programming

The A1ST60 provides 8 timers that can be set directly with a screwdriver to values between 0.1 and 600 seconds.

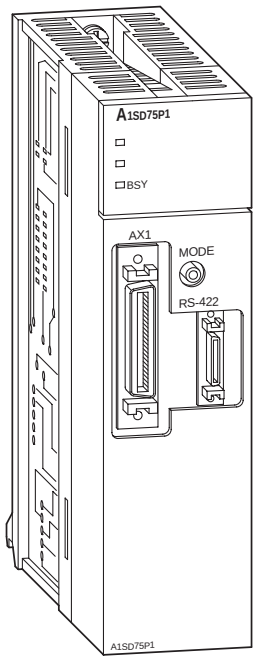
### Special features:

- Eight additional hardware timers to supplement the PLC CPU's own internal timers
- Timer setting ranges:
  - 0.1 to 1.0 s
  - 1 to 10 s
  - 10 to 60 s
  - 60 to 600 s
- Timer status indicated by LEDs
- Integrated pause function for stopping the time of active timers

| Specifications | | A1ST60 |
|---|---|---|
| Input points | | 8 potentiometers for timer setting |
| Timer setting range | | 0.1 – 1.0 s, 1 – 10 s, 10 – 60 s, 60 – 600 s |
| Overall accuracy | | ±2.0 % |
| Setting possibilities | | Separate setting with potentiometers and DIP switches |
| I/O points | | 16 |
| Applicable wire size | $mm^2$ | 0.75 – 1.5 |
| Internal power consumption (5 V DC) | mA | 55 |
| Weight | kg | 0.13 |
| Dimensions (W x H x D) | mm | 34.5 x 130 x 93.6 |

| Order information | Art. no. | 33196 |
|---|---|---|

## MELSEC AnS/QnAS Axes 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.

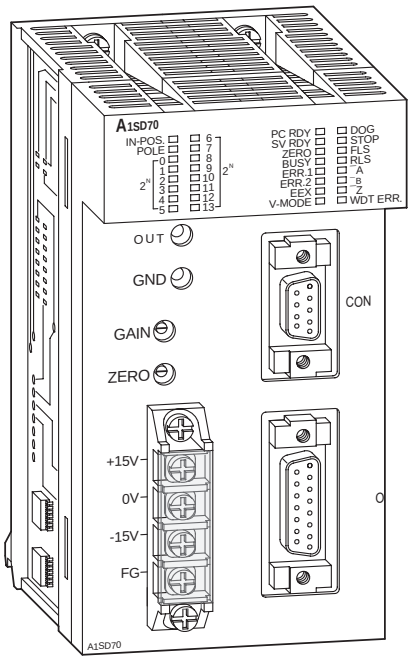
### Special features:

- Control of up to three axes with linear interpolation (A1SD71-S2, A1SD75P2/P3) or circular interpolation (A1SD75P2/P3)
- Storage of up to 400 positional data in the A1SD71-S2 (battery-supported) or 600 positional data in the A1SD75P1/P2/P3 (flash ROM)
- Units of travel can be defined in pulses, mm, inch or degrees.
- In the A1SD71-S2, configuration and presetting of positional data is performed via the PLC program or with the aid of the teaching unit AD71TU.
- In the A1SD75P1/P2/P3, configuration and presetting of positional data is carried out by means of the PLC program (all 400 positional data) or with the aid of the MS-DOS software SW1IVD-AD75PE

| Specifications | | A1SD71-S2 | A1SD75P1-S3 | A1SD75P2-S3 | A1SD75P3-S3 |
|---|---|---|---|---|---|
| Control axes | | 2 | 1 | 2 | 3 |
| Interpolation | | Linear interpolation | — | Linear and circular interpolation | Linear and circular interpolation |
| Points per axis | | 400 | Peripheral: 600, PC: 100 | Peripheral: 600, PC: 100 | Peripheral: 600, PC: 100 |
| Output signal | | Pulse generator phase | Pulse generator phase | Pulse generator phase | Pulse generator phase |
| Output frequency | kHz | 10 – 200000 | 1 – 400000 | 1 – 400000 | 1 – 400 000 |
| Positioning | method | Pulse control: absolute data and/or incremental; speed/position swiching control: incremental; locus control: absolute data and/or incremental | | | |
| | positioning units | 1 – 16252928 pulse, max. 162 m (command unit: 0.1 – 10 mm/pulse), max. 16200 degree or max. 16200 inch (command unit: 1 x $10^5$ – 0.001 degree/pulse 1 x $10^5$ – 0.001 inch/pulse) | Absolute data method: -2147483648 – 2147483647 pulse; -214748364.8 – 214748364.7 µm; -21474.83648 – 21474.83647 inch; 0 – 359.99999 degree<br>Incremental method: -2147483,648 – 2147483 647 pulse; -214 748 364.8 – 214 748 364.7 µm; -21 474.83648 – 21 474.83647 degree; -21 474.83648 – 21 474.83647 nch<br>Speed/position switching control: 0 – 2147483647 pulse; 0 – 214748364.7 µm; 0 – 21474.83647 degree; 0 – 21474.83647 inch | | |
| | positioning speed | 10 – 200000 pulse/s, 10 – 120000 mm/min, 1 – 12000 degree/min, 1 – 12000 inch/min | 1 – 1000000 pulse/min; 0.01 – 6000000.00 mm/min; 0.001 – 600000.000 degree/min; 0.001 – 600000.000 inch/min | | |
| | acceleration/deceleration processing | Automatic trapezoidal acceleration and deceleration | Automatic trapezoidal or S-pattern acceleration and deceleration | | |
| | acceleration and deceleration time | 64 – 50000 ms | 1 – 65535 [8388608]* ms (4 patterns each can be set) | | |
| | rapid stop decceleration time | | 1 – 65535 [8388608]* ms | | |
| I/O points | | 48 (2 slots) | 32 | 32 | 32 |
| Internal power consumption (5 V DC) | mA | 800 | 700 | 700 | 700 |
| External power consumption (4.75 – 26.4 V DC) | mA | 50 | — | — | — |
| Weight | kg | 0.38 | 0.35 | 0.35 | 0.35 |
| Dimensions (W x H x D) | mm | 69.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |
| **Order information** | Art. no. | 33200 | 65028 | 65029 | 65030 |
| **Accessories** | | Software for all A1SD75: SW1□VD-AD75PE, art. no.: 65619; adapter cable: A1SD75-C01H, art. no.: 54943; spare part plug for axis control, 36 pins, art. no.: 62890 | | | |

* Values in brackets indicate stepping motor mode

## ■ MELSEC AnS/QnAS Single Axis Positioning Module




### Positioning with position control loop

The module is used for positioning by means of servo drives. Here, the output delivers an analog voltage. To monitor the position, the displacement transducer is fed back to the module.

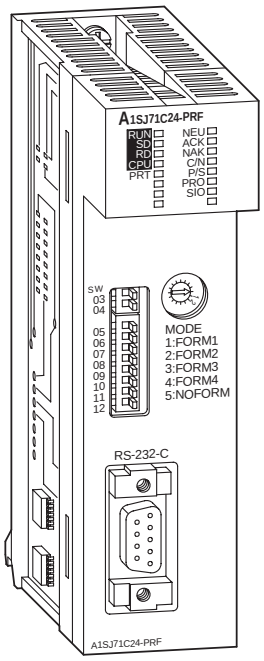
### Special features:

- The positional data is preset by means of the PLC program.
- Integrated digital/analog converter for converting the digital adjustment into an analog signal
- Online speed and address change possible
- Online monitoring of setpoint value (command pulses), actual value (feedback pulses) and adjustment (difference between command and feedback)
- An electronic gear function permits adjustment of the distance travelled per pulse

| Specifications | | A1SD70 |
|---|---|---|
| Axes | | 1 (with position control) |
| Signal input level | | 5 V DC (TTL, RS422), 12 V DC (open collector) |
| Max. counting frequency | kHz | 100 |
| Counting resolution | | 31 bits + sign (binary), -2 147 483 648 – +2 147 483 647 |
| Acceleration/deceleration time | ms | 2 – 9999 |
| Positioning speed | | 1 – 400000 pulses/s |
| External digital inputs | | Zero, stop, upper/lower range limit, servo ready, control mode |
| Input rating | | 5 – 24 V DC (6 mA) |
| External digital outputs | | Servo error / module error |
| Output rating | | 5 – 24 V DC |
| In position control range | | Adjustable between 1 – 2047 pulses (hard / smooth) |
| Acceleration and deceleration | | Automatic, trapeziodal acceleration and deceleration |
| Analog output for speed control | | ≤ 10 V DC (adjustable between ±5 V and ±10 V) |
| I/O points | | 48 (2 slots) |
| Internal power consumption (5 V DC) | mA | 300 |
| External power consumption | | 200 mA (+15 V DC), 20 mA (-15 V DC) |
| Weight | kg | 0.4 |
| Dimensions (W x H x D) | mm | 69.5 x 130 x 93.6 |

| Order information | Art. no. | 29539 |
|---|---|---|

## ■ MELSEC AnS/QnAS Interface Modules




### Data exchange with peripheral devices

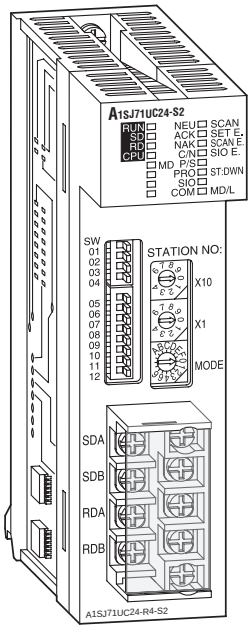
This module enables communication with peripheral devices via a standard RS-232C interface. The peripherals are connected point-to-point on a 1:1 basis.

### Special features:

- Enables PCs connected to the system to access the full data set of the MELSEC AnS 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
- Options for connection of a printer
- Integrated 32KB EEPROM memory for logging quality, productivity or alarm data that can be printed out when required
- Module and communications status shown by LEDs
- The A1SJ71UC24-R4 has the same features as the A1SJ71UC24-R2. The only difference is that a PC can access up to 32 controllers via RS422/485 version.

| Specifications | | | A1SJ71UC24-R2 | A1SJ71UC24-R4 | A1SJ71C24-PRF |
|---|---|---|---|---|---|
| Interface | | type | RS232C | RS422 / 485 | RS232C |
| 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 | 300 – 19200 | 300 – 19200 (computer link)<br>19200 – 38400 (multidrop) | 300 – 19200 |
| | distance | m | 15 | 500 | 15 |
| Max. no of stations in a multidrop network | | | — | 32 | — |
| 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 | YES / NO selectable |
| X ON / X OFF (DC1 / DC3) | | | YES / NO selectable | YES / NO selectable | YES / NO selectable |
| EEPROM memory | | | — | — | 32 kbyte (400 x 80 characters) |
| I/O points | | | 32 | 32 | 32 |
| Internal power consumption (5 V DC) | | mA | 100 | 100 | 100 |
| Weight | | kg | 0.49 | 0.55 | 0.22 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 64561 | 64562 | 29537 |

## MELSEC AnS/QnAS MODBUS Slave Interface Modules




### Modbus protocol via RS232 / RS422 / RS485

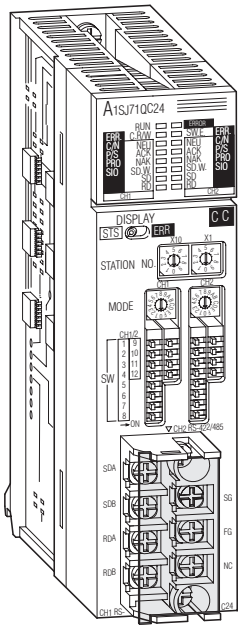
The A1SJ71UC24-R4-S2 and A1SJ71UC24-R2-S2 enable third-party devices to access MELSEC AnS and QnAS controllers using the MODBUS protocol.

### Special features:

- Support for both ASCII and RTU procedures
- Slave functionality – up to 31 MELSEC controllers can be allocated to a third-party device.
- Support for functions 1, 3, 5–8, 11, 12, 15–17, 20 and 21
- Enables access to the entire data of AnAS respec. QnAS CPUs.

| Specifications | | | A1SJ71UC24-R2-S2 | A1SJ71UC24-R4-S2 |
|---|---|---|---|---|
| Module type | | | Slave | Slave |
| Interface | | type | RS232 | RS422 / 485 |
| Communications mode | | | Half duplex | Half duplex |
| Synchronisation | | | Asynchronous communications | Asynchronous communications |
| Data transfer | rate | bit/s | 300 – 19200 | 300 – 19200 |
| | distance | m | 15 | 500 |
| | mode | | ASCII and RTU | ASCII and RTU |
| Data format | | bit | 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 (ASCII mode: LRC, RTU mode: CRC-16) | Parity check (ASCII mode: LRC, RTU mode: CRC-16) |
| Isolation method | | | Photocoupler | Photocoupler |
| I/O points | | | 32 | 32 |
| Internal power consumption (5 V DC) | | mA | 100 | 100 |
| Weight | | kg | 0.49 | 0.55 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 54355 | 54354 |
| **Accessories** | | | Interface converter CR01-R2/R4 SET, art. no. 56172 (refer to page 79) | |

## ■ MELSEC QnAS Interface Modules




### High-speed data communications

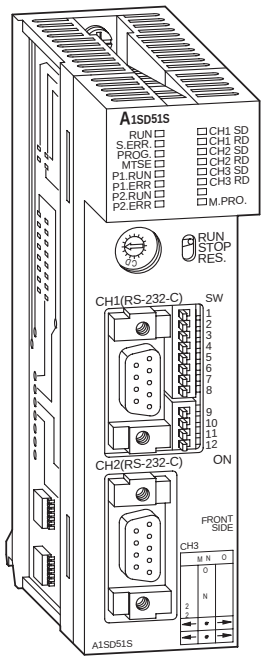
The QnAS interface modules provide extremely high data throughput rates, which can be invaluable for process supervision software and similar applications. Up to 480 data words can be exchanged between the PLC CPU and the PC per END instruction.

### Special features:

- Enables PCs connected to the system to access the full data set of the MELSEC QnAS CPU with process supervision or monitoring software
- Support for plain ASCII data exchange with connected devices such as barcode readers, scales and identification systems
- Compatible to A1SJ71UC24R2/R4 with protocol formats 1 – 4
- When the special dedicated Q instructions are used (protocol format 5) PC process supervision software can access data at least 5 times faster than it is now possible using the conventional protocol formats 1 – 4.
- The integrated EEPROM can store up to 200 pre-programmed protocols for accessing third-party devices.

| Specifications | | | A1SJ71QC24-R2 | A1SJ71QC24 | |
|---|---|---|---|---|---|
| Interface | | Typ | 2 x RS232C | 1 x RS232, 1 x RS422 / 485 | |
| Communications mode | | | Full duplex / half duplex | Full duplex / half duplex | |
| Synchronisation | | | USART | USART | |
| Data transfer | rate | bit/s | 300 – 19200 | 300 – 19200 | |
| | distance | m | 15 | 1200 | |
| Max. stations in a multidrop network | | | — | 32 | |
| Data format | | 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 | |
| | | | **RS232** | **RS232** | **RS422/485** |
| Flow control | DTR / DSR | | ● | ● | ● |
| | RS / CS | | ● | ● | — |
| | CD | | ● | ● | — |
| | DC | | ● | ● | ● |
| X ON / X OFF (DC1 / DC3) | | | YES / NO selectable | YES / NO selectable | |
| I/O points | | | 32 | 32 | |
| Internal power consumption (5 V DC) | | mA | 160 | 240 | |
| Weight | | kg | 0.249 | 0.294 | |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | |
| **Order information** | | Art. no. | 66542 | 66543 | |
| **Accessories** | | | Interface converter CR01-R2/R4 SET, art. no. 56172 (refer to page 79) | | |

## ■ MELSEC AnS/QnAS High-Speed Communications Module




### 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:

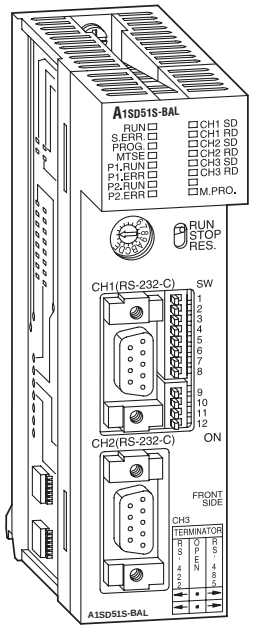
- Two RS232C interfaces and one RS422/485 interface
- Two BASIC programs can be operated in parallel (multitasking).
- The tasks can be stored in the module as interpreter programs or in compiled form.
- The integrated EEPROM is used for storage.
- Online and offline program creation is possible.
- The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

| Specifications | | | A1SD51S |
|---|---|---|---|
| Interfaces | | type | 1 x RS422/485, 2 x RS232 |
| Microprocessor | | type | 80C186 (15 MHz) |
| Number of parallel tasks | | | 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 | 300 – 19200 |
| | distance | m | 500 (RS422/485), 15 (RS232C) |
| Program language | | | AD51H-BASIC |
| Internal memory | program memory | kbyte | 64 x 1 task or 32 x 2 tasks |
| | common memory for tasks | kbyte | 8 |
| | data buffer to PLC | kbyte | 6 |
| | extension relays | | 1024 |
| | extension data registers | | 1024 (2 kbyte) |
| Memory backup capability | | | Provided for common memory, extension relay and extension register. |
| Memory for programs | | | EEPROM memory: 64 kbyte |
| I/O points | | | 32 (1 slot) |
| Internal power consumption (5 V DC) | | mA | 400 |
| Weight | | kg | 0.3 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 |

| Order information | Art. no. | 46276 |
|---|---|---|

| Accessories | Programming software for PC/AT (MS-DOS): SW1IX-AD51HPE, art. no.: 33102 |
|---|---|

## MELSEC AnS/QnAS High-Speed Communications Module




### Communications module with 3964R procedure

The A1SD51S-BAL has 3 standard interfaces for communications with intelligent peripheral devices that support the 3964R (RK512 active) communications protocol. This makes it possible to connect products from other manufacturers without any additional programming.

### Special features:

- All three interfaces can be used simultaneously.
- You can store up to 30 commissions by setting the appropriate parameters.
- Up to 10 commissions can be executed simultaneously.
- Optoelectronic couplers for isolation of process and control systems are fitted as standard equipment
- The module can request data from e.g. a S5-CP525 or CP524 via the 3964(R)RK512 procedure. However, it can not respond to the requests of other devices.

| Specifications | | | A1SD51S-BAL |
|---|---|---|---|
| Interface | | type | 2 x RS232, 1 x RS422 |
| Transmission system | | | Half duplex / full duplex |
| Synchronisation | | | Asynchronous communications |
| Data transfer | rate | bit/s | 300 – 9600 |
| | distance | | 15 m at RS232, 500 m at RS422 |
| Data format | | | 1 start bit, 7 or 8 data bits, 1 or 0 parity bit, 1 or 2 stop bit |
| Error correction method | | | Parity check, checksum |
| Supported 3964R (RK512) functions | | | FETCH and SEND data block (active). The module can not respond to requests from other stations. |
| Supported data blocks | | | DB0 and DB255 |
| Supported A series devices | | | D, W, R |
| Processing time for FETCH or SEND of 32 data words | | ms | Approx. 300 |
| X ON / X OFF (DC1 / DC3) | | | YES / NO selectable |
| I/O points | | | 32 |
| Internal power consumption (5 V DC) | | mA | 400 |
| Weight | | kg | 0.3 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 65065 |
| **Accessories** | | | — |

# ETHERNET

## Data communications

ETHERNET is now one of the most widely-used networks. It provides the link between the office world and control systems. ETHERNET is a platform for a very wide range of data communications protocols. The combination of ETHERNET and the extremely widespread TCP/IP protocol enables high-speed data communications between process supervision systems and the MELSEC AnSH, QnAS, AnU and QnA series.

## Structure

Up to 5 ETHERNET segments can be linked to one another per repeater. There are two standard cable types: "Yellow" cable using the 10BASE5 interface and "Cheapernet" cable (Thin Ethernet) using the 10BASE2 interface.

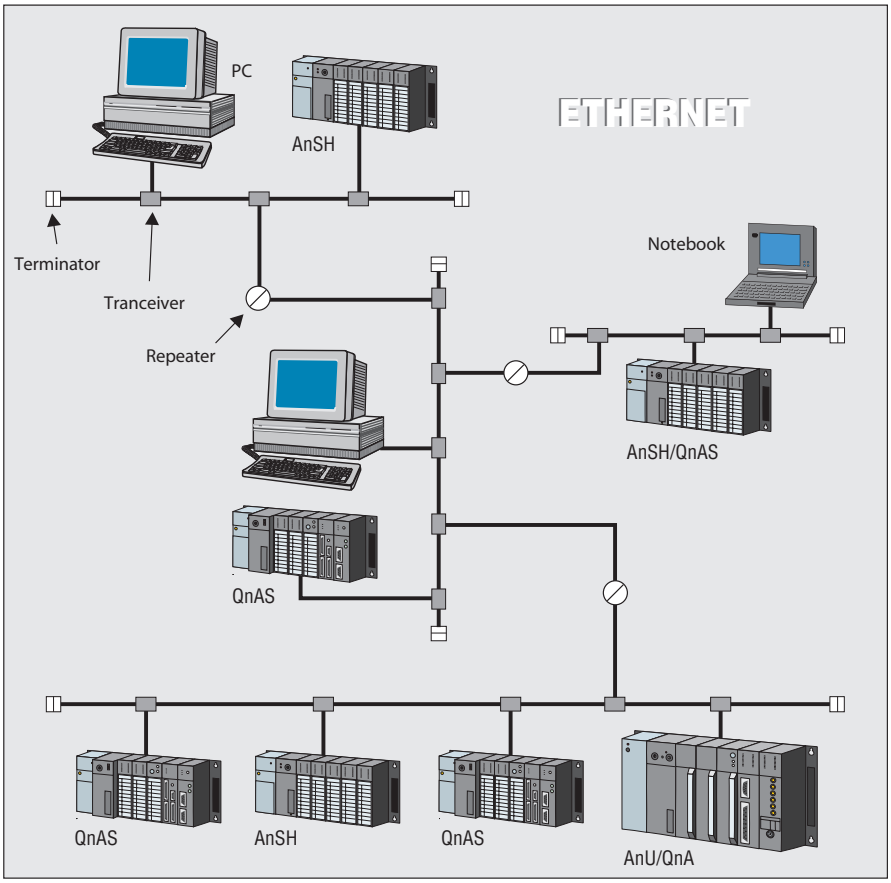
Bus segments using Yellow cable can be up to 500m long. Cheapernet configurations support bus segment cable lengths of up to 185m.

## Data exchange

TCP/IP provides logical point-to-point links between two ETHERNET stations. Using the TCP/IP protocol a process supervision system can request 256 data words per query, or a full 480 words if a QnAS compatible ETHERNET card is used. The speed of the response to the query varies depending on the type of CPU used (AnAS or QnAS) and the ETHERNET module. The response time of a pure QnAS system (QnAS + A1SJ71QE71-B2/B5) is around eight times faster than that of an equivalent AnAS system.

## FTP server functionality

The QnAS compatible ETHERNET modules also provide FTP server functionality, in addition to the normal TCP/IP communications services. This means that a personal computer running standard communications software can read from and write to the QnAS CPU sequence program via the Internet.



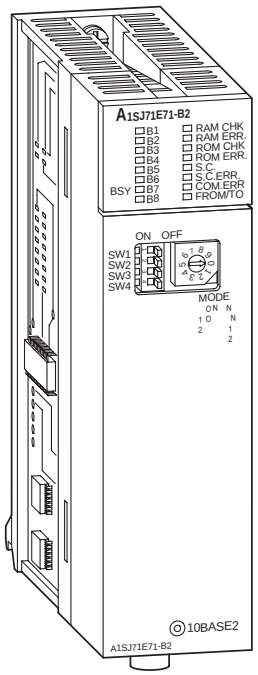

## Administration

MELSEC MEDOC *plus* function blocks are available for all the PLC CPUs, making the configuration of one or more TCP/IP links a quick and easy process.

Cable and logic diagnostics are also simple because all MELSEC ETHERNET cards support the PING instruction.

| Specifications | Yellow Cable | Thin Ethernet, Cheapernet |
|---|---|---|
| Cable type | 10BASE5 | 10BASE2 |
| Max. distance between 2 stations | 2500 m | 925 m |
| Min. distance between 2 stations | 2.5 m | 0.5 m |
| Max. segment length | 500 m | 185 m |
| Max. permitted no. of repeaters | 4 | 4 |
| Max. stations per segment | 100 | 30 |

## ■ MELSEC AnS ETHERNET Module




### The high-speed connection to the PLC

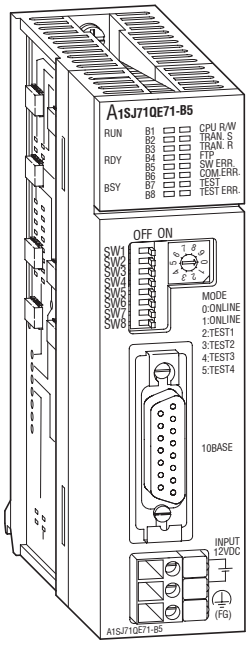
This module connects the MELSEC AnS system to the open, non-proprietary ETHERNET. This enables process supersion packages and other programs from a wide variety of vendors to access all devices of the controller at a rate of 10 Mbits per second.

### Special features:

- Both cable types are supported:
  - 10BASE2 (Cheapernet using RG58 coax cable)
  - 10BASE5 (ETHERNET using Yellow cable)
- Communications protocol TCP/IP with ARP
- Module and communication status indicated by LEDs
- Full support for the MELSEC MEDOC *plus* programming software package (read and write programs, monitoring, remote PLC operating mode change (RUN/STOP))
- Ready-to-use MELSEC MEDOC *plus* function block available
- Integrated bus cable diagnostics
- PING diagnostics function support
- Automatically detects whether the communication partner is ready to communicate.

| Specifications | | | A1SJ71E71-B2-S3 | A1SJ71E71-B5-S3 |
|---|---|---|---|---|
| Module type | | | Client / server | Client / server |
| Communications method | | | ETHERNET: CSMA/CD | ETHERNET: CSMA/CD |
| Interface | | type | 10BASE2 | 10BASE5 |
| Communications data | transfer rate | Mbit/s | 10 | 10 |
| | transfer type | | Base band | Base band |
| | max. network length | m | 925 | 2500 |
| | max. segment length | m | 185 | 500 |
| | nodes | | Max. 30/segment | Max. 100/segment |
| | min. distance between 2 nodes | m | 0.5 | 2.5 |
| Data buffer | fixed buffer | | 2 kbyte x 8 | 2 kbyte x 8 |
| | RAM buffer | | 6 kbyte x 2 | 6 kbyte x 2 |
| Simultaneous connections | | | Max. 8 | Max. 8 |
| Transport protocol | | | TCP/IP with ARP, UDP/IP | TCP/IP with ARP, UDP/IP |
| I/O points | | | 32 | 32 |
| Internal power consumption (5 V DC) | | mA | 520 | 350 |
| Weight | | kg | 0.27 | 0.27 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 62663 | 62662 |
| **Accessories** | | | — | — |

## ■ MELSEC QnAS ETHERNET Module




### The high-speed connection for the QnAS series

This module connects the MELSEC QnAS system to the open, non-proprietary ETHERNET. This enables process supervision packages and other programs from a wide variety of vendors to access all devices of the QnAS controller at a rate of 10 Mbits per second.

**Special features:**

- Both cable types are supported:
  - 10BASE2 (Cheapernet using RG58 coax cable)
  - 10BASE5 (ETHERNET using Yellow cable )
- Communications protocol TCP/IP with ARP
- PING diagnostics function support
- FTP server function enabling program uploads and downloads via the Internet with standard communications software
- Rapid response times because the system can exchange 480 data words per protocol
- Integrated easy bus cable diagnostics
- A function block library for MELSEC MEDOC *plus* makes the configuration of TCP/IP links quick and easy.

| Specifications | | | A1SJ71QE71-B2 | A1SJ71QE71-B5 |
|---|---|---|---|---|
| Module type | | | Client / server | Client / server |
| Communications method | | | ETHERNET: CSMA/CD | ETHERNET: CSMA/CD |
| Interface | | type | 10BASE2 | 10BASE5 |
| Communica-tions data | transfer rate | Mbit/s | 10 | 10 |
| | transfer type | | Base band | Base band |
| | max. network length | m | 925 | 2500 |
| | max. segment length | m | 185 | 500 |
| | nodes | | 30 | 100 |
| | min. distance between 2 nodes | m | 0.5 | 2.5 |
| Data buffer | fixed send/receive buffer | | 1 k words x 8 | 1 k words x 8 |
| | variable buffer | | 6 k words | 6 k words |
| Simultaneous connections | | | 8 + 1 FTP connection | 8 + 1 FTP connection |
| Transport protocol | | | TCP/IP with ARP, UDP/IP | TCP/IP with ARP, UDP/IP |
| I/O points | | | 32 | 32 |
| Internal power consumption (5 V DC) | | mA | 800 | 600 |
| Weight | | kg | 0.28 | 0.27 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 66550 | 66546 |
| **Accessories** | | | — | — |

## MELSECNET/10 Network

### Data communications

MELSECNET/10 enables extremely fast cyclic data exchange between the MELSEC PLCs of the AnSH, QnS, AnA/U and QnA series. It can also be used to connect remote I/O modules to these controllers.

You can connect up to 255 individual MELSECNET/10 networks to one another. An integrated routing function makes it very easy to pass data from one network to another.

### Structure

The ring structure of MELSECNET/10 enables very large network coverage of up to 30 km.

### Cable types

MELSECNET/10 gives you a wide choice of cable types and topologies:

- Coaxial bus (max. 500 m)
- Coaxial duplex loop (max. 30 km)
- Fibre-optics duplex loop (max. 30 km)

### Data exchange

Efficient cyclic data exchange is ensured with an exceptionally large data volume of 8192 words and 8192 relays.

### Administration

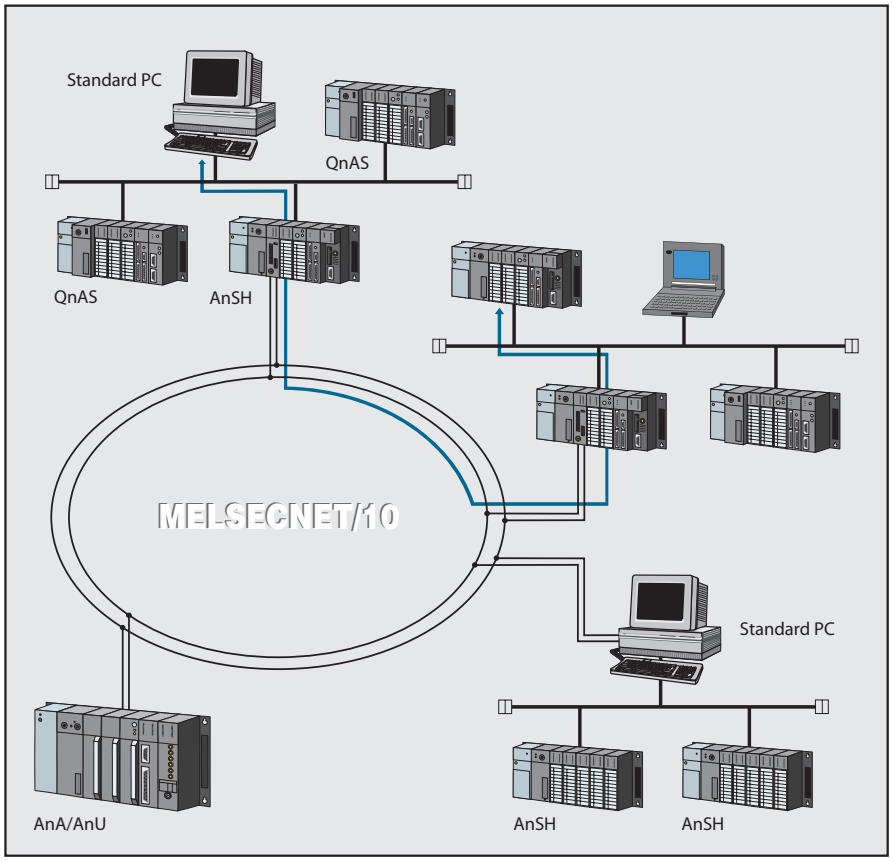
MELSECNET/10 enables you to program and monitor every PLC in the system from any station.

The Floating Master architecture ensures reliable network operation even if the network manager fails.

### Special features

In parallel to the cyclic data exchange it is also possible for any station to send data to and read data from any other station, even across several networks. The system also supports multicast and broadcast functions.

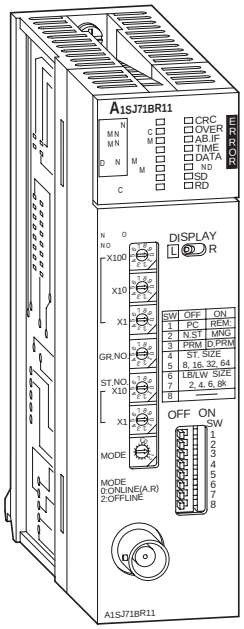
In MELSECNET/10 systems you only have to set parameters for the network manager, making installation very quick and simple.




| Specifications | | | Electrical | | Optical | | |
|---|---|---|---|---|---|---|---|
| Cable type | | | Coaxial bus | Coaxial duplex loop | Glass fibre SI185/230 µm | Glass fibre GI50/125 µm | Glass fibre GI62.5/125 m |
| Data transfer | rate | Mbit/s | 10 | 10 (20) | 10 (20) | 10 (20) | 10 (20) |
| | distance between 2 stations | m | | 500 | 1 000 | 2 000 | 2 000 |
| | total coverage | m | ≤500 (2500) | ≤30000 | ≤30000 | ≤30000 | ≤30000 |
| Media | impedance (100 kHz) | Ω | 75 | 75 | — | — | — |
| | transmission losses | | — | — | ≤5.5 dB / km | ≤3 dB / km | ≤3 dB / km |
| | transmission bandwidth | | — | — | ≥20 MHz / km | ≥300 MHz / km | ≥300 MHz / km |
| **Connectors** | | | | | | | |
| Connection system | | | RG59 | RG59 | CA7003 | CA9003S | CA9003S |
| **Order information** | | Art. no. | — | — | 69365 | 29603 | 29603 |

| Cable type | Layout | Max. length | Order information | Art. no. |
|---|---|---|---|---|
| SI cable | Connection plugs at both ends; 2-conductor type for interior installation; simple cable protection | Fixed length 2 m | AS-2P-2M-A | 126228 |
| | | Fixed length 5 m | AS-2P-5M-A | 62430 |
| | | Fixed length 30 m | AS-2P-30M-A | 52353 |
| | | Fixed length 50 m | AS-2P-50M-A | 62457 |
| GI cable GI62,5/125 µm | Connection plugs at both ends; 2-conductor type for interior installation; simple cable protection | Fixed length 5 m | AGS-2P-05 M-625A | 104330 |
| GI cable GI50/125 µm | | Fixed length 5 m | AG-2P-5M-A | 38784 |
| GI cable GI50/125 µm | Adapter cable from Hitachi CA9103S plug – ST plug | Fixed length 4 m | AGS-CS-4M-50A | 58630 |
| GI cable GI62,5/125 µm | | Fixed length 3 m | AGS-CS-3M-625A | 58632 |
| | | Fixed length 4 m | AGS-CS-4M-625A | 58631 |

## ■ MELSEC AnS MELSECNET/10 Modules




### Reliable and flexible communications

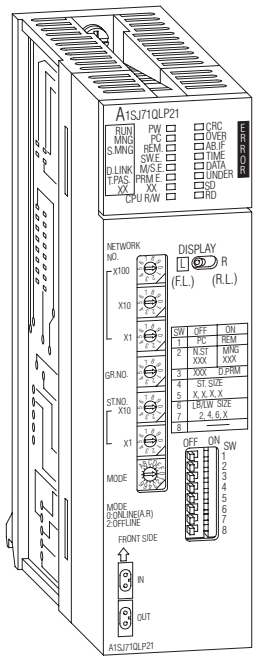
MELSECNET/10 is the most powerful MELSEC network, supporting both high-speed cyclic communications and powerful acyclic communications functions.

### Special features:

- High data transfer rate (10 Mbits/s) with coaxial bus systems and optional 10/20 Mbits/s with optical loop systems
- The A1SJ71 BR11 and A1SJ71LP21(GE) modules can be used for:
  - PLC ↔ PLC, PC data communications
  - PLC ↔ remote I/O control
- Floating Master technology guarantees trouble-free operation no matter which station in the system is powered down.
- Up to four MELSECNET/10 modules can be installed in a single PLC, handling routing functions across up to as many as 255 networks.
- The network system supports data communications between any two stations no matter how many networks lie between them.
- Large data volumes via link devices for cyclic data communications.

| Specifications | | | A1SJ71BR11 | A1SJ71LP21 | A1SJ71LP21GE |
|---|---|---|---|---|---|
| Module type | | | Manager / local stations | Floating Master | Floating Master |
| Communications method | | | Token bus | Token ring | Token ring |
| Topology | | | Coaxial bus system | Redundant optical loop system | Redundant optical loop system |
| Synchronisation | | | Frame synchronisation method | Frame synchronisation method | Frame synchronisation method |
| Transmission channel | | | Single bus | Redundant loop | Redundant loop |
| Link registers | | | 8192 (0 – 1FFF) | 8192 (0 – 1FFF) | 8192 (0 – 1FFF) |
| Max. cyclic data for link in one station | | | ≤ 2000 bytes | ≤ 2000 bytes | ≤ 2000 bytes |
| Modulation method | | | Manchester | NRZI | NRZI |
| Transmission format | | | Conforms to HDLC | Conform to HDLC | Conforms to HDLC |
| Terminating resistor | | Ω | 75 | — | — |
| No. of networks in one system | | | Max. 255 | Max. 255 | Max. 255 |
| Stations per network | | | 32 (1 manager, 31 local stations) | 64 (1 manager, 63 local stations) | 64 (1 manager, 63 local stations) |
| Groups (multicast) | | | Max. 9 | Max. 9 | Max. 9 |
| Transmission | rate | Mbit/s | 10 | 10 (20) | 10 (20) |
| | distance | | 300 m / 500 m (depends on cable used) | SI 200/220: 500 m, QSI 185/230: 1000 m | GI 62.5/125: 2000 m |
| | cable | | RG59 BU / RG6 AU | — | — |
| | connectors | | BNC-P-3-Ni / BNC-P-5 | CA7003 | CA7003S |
| Max. compensation time during power failure | | ms | ≤ 20 | ≤ 20 | ≤ 20 |
| I/O points | | | 32 | 32 | 32 |
| Internal power consumption (5 V DC) | | mA | 800 | 650 | 650 |
| Weight | | kg | 0.33 | 0.33 | 0.33 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 47869 | 47868 | 53457 |
| **Accessories** | | | Terminating resistor: BNC-75 OHM, art. no.: 53871 | Optical duplex plug for SI cable: CA7003, art. no. 9546<br>Optical duplex plug for GI cable: CA9003S, art. no. 29603<br>Optical SI cable: 2 m: AS-2P-2M-A, art. no. 126228, 5 m: AS-2P-5M-A, art. no. 62430, 30 m: AS-2P-30M-A, art. no. 52353, 50 m: AS-2P-50M-A, art. no. 62457; up to 1000 m on request<br>Optical GI cable: fibre optics GI62,5/125 mm; AGS-GS-3M-625A, art. no. 58632<br>fibre optics GI62,5/125 mm; AGS-GS-4M-625A, art. no. 58631 | |

## ■ MELSEC QnAS MELSECNET/10 Modules




### Reliable and flexible communications

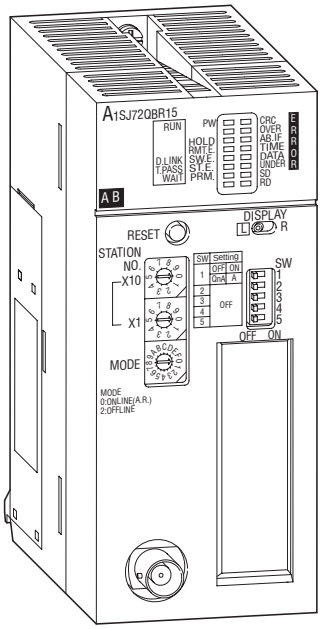
MELSECNET/10 is the most powerful MELSEC network, supporting both high-speed cyclic communications and powerful acyclic communications functions. The extremely high-speed data access performance of the QnAS CPUs guarantees very short response times in communications between two controllers.

### Special features:

- High data transfer rate (10Mbits/s) with coaxial bus systems and optional 10/20Mbits/s with optical loop systems
- The modules can be used for:
  - PLC ↔ PLC, PC data communications
  - PLC ↔ remote I/O control
- Otherwise these modules have the same features as the modules on the previous page, plus they can also be used for the configuration of a redundant master system for remote I/Os in MELSECNET/10.

| Specifications | | | A1SJ71QBR11 | A1SJ71QLR21 | A1SJ71QLP21 |
|---|---|---|---|---|---|
| Module type | | | Floating master | Floating master | Floating master |
| Communications method | | | Token bus | Token ring | Token ring |
| Topology | | | Coaxial bus system | Coaxial bus system | Optical loop system |
| Synchronisation | | | Frame synchronisation method | Frame synchronisation method | Frame synchronisation method |
| Transmission channel | | | Single bus | Redundant loop | Redundant loop |
| Link register | | | 8192 (0 – 1FFF) | 8192 (0 – 1FFF) | 8192 (0 – 1FFF) |
| Max. cyclic data for link in one station | | | ≤ 2000 bytes | ≤ 2000 bytes | ≤ 2000 bytes |
| Modulation method | | | Manchester | Manchester | NRZI |
| Transmission format | | | Conforms to HDLC | Conforms to HDLC | Conforms to HDLC |
| Terminating resistor | | Ω | 75 | 75 | — |
| No. of networks in one system | | | 255 | 255 | 255 |
| Stations per network | | | 32 (1 manager, 31 local stations) | 64 (1 manager, 63 local stations) | 64 (1 manager, 63 local stations) |
| Groups (multicast) | | | Max. 9 | Max. 9 | Max. 9 |
| Transmission | rate | Mbit/s | 10 | 10 (acc. to 20 multiplex) | 10 (acc. to 20 multiplex) |
| | distance | m | 300 m / 500 m (depends on cable used) | 300 m / 500 m (depends on cable used) | SI 200/220: 500 m, QSI 185/230: 1000 m |
| | cable | | RG59 BU / RG6 AU | RG59 BU / RG6 AU | — |
| | plug | | BNC-P-3-Ni / BNC-P-5 | BNC-P-3-Ni / BNC-P-5 | CA7003 |
| Max. compensation time during power failure | | ms | ≤ 20 | ≤ 20 | ≤ 20 |
| I/O points | | | 32 | 32 | 32 |
| Internal power consumption (5 V DC) | | mA | 800 | 650 | 650 |
| Weight | | kg | 0.3 | 0.3 | 0.3 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 66540 | 128797 | 66541 |
| **Accessories** | | | Terminating resistor: BNC-75 OHM, art. no.: 53871 | Terminating resistor: BNC-75 OHM, art. no.: 53871 | Optical duplex plug for SI cable: CA7003, art. no. 69365<br>Optical SI cable:<br>2 m: AS-2P-2M-A, art. no. 126228,<br>5 m: AS-2P-5M-A, art. no. 62430,<br>30 m: AS-2P-30M-A, art. no. 52353<br>50 m: AS-2P-50M-A, art. no. 62457;<br>up to 1000 m on request |

## ■ MELSEC QnAS MELSECNET/10 Module




### Complex remote Inputs/Outputs

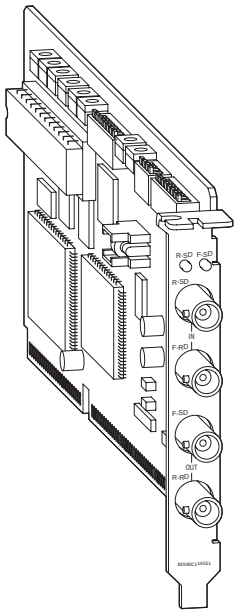
Enables fast and cost-effective connection of extremely complex remote I/Os to a host PLC CPU in MELSECNET/10 networks.

### Special features:

- Enables configuration of very complex remote inputs and outputs with:
  - Digital I/Os
  - Analog I/Os
  - Positioning modules
  - Communications modules (ETHERNET/ Computer Link)
  - Etc.
- Supports definition of a Standby Master for remote I/Os in MELSECNET/10 networks (only with AnS and QnAS series CPUs).
- The Master CPU can be programmed and monitored from the remote module.
- Installation on the main base unit in the place of the PLC CPU.

| Specifications | | | A1SJ72QBR15 | A1SJ72QLP25 |
|---|---|---|---|---|
| Module type | | | Slave | Slave |
| Communications method | | | Token bus | Token ring |
| Topology | | | Coaxial bus system | Optical loop system |
| Synchronisation | | | Frame synchronisation method | Frame synchronisation method |
| Transmission channel | | | Single bus | Redundant loop |
| No. of I/Os in a network | | | Max. 8192 | Max. 8192 |
| No. of data per slave | | | Max. 1600 bytes | Max. 1600 bytes |
| Modulation method | | | Manchester | NRZI |
| Transmission format | | | Conforms to HDLC | Conforms to HDLC |
| Terminating resistor | | Ω | 75 | — |
| No. of networks in one system | | | 255 | 255 |
| Stations per network | | | 33 (1 manager, 32 local stations) | 64 (1 manager, 63 local stations) |
| Transmission | rate | Mbit/s | 10 | 10 (20) |
| | distance | m | 300 m / 500 m (depends on cable used) | SI 200/220: 500 m, QSI 185/230: 1000 m |
| | cable | | RG59 BU / RG6 AU | — |
| | plug | | BNC-P-3-Ni / BNC-P-5 | CA7003 |
| Max. compensation time during power failure | | ms | ≤ 20 | ≤ 20 |
| I/O points | | | — | — |
| Internal power consumption (5 V DC) | | mA | 700 | 520 |
| Weight | | kg | 0.43 | 0.41 |
| Dimensions (W x H x D) | | mm | 54.5 x 130 x 93.6 | 54.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 68450 | 68449 |
| **Accessories** | | | Terminating resistor: BNC-75 OHM, art. no.: 53871 | Optical duplex plug for SI cable: CA7003, art. no. 69365<br>Optical SI cable: 2 m: AS-2P-2M-A, art. no. 126228,<br>5 m: AS-2P-5M-A, art. no. 62430,<br>30 m: AS-2P-30M-A, art. no. 52353<br>50 m: AS-2P-50M-A, art. no. 62457;<br>up to 1000 m on request |

## ■ Interface Boards for MELSECNET/10



### Interface boards for MELSECNET/10

These interface boards enable you to integrate personal computers into a MELSECNET/10-Netzwerk.

### Special features:

- Fast data rates between the personal computer and the programmable logic controller (faster than ETHERNET)
- The PC can access all other CPUs, even across multiple networks (integrated routing function)
- Perfect for PLC programming at MELSECNET/10
- Ideal for data and program archiving
- Up to 4 interface boards can be installed in each personal computer.

| Specifications | | | A70BDE-J71QLP23 | A70BDE-J71QLP23GE | A70BDE-J71QLR23 | A70BDE-J71QBR13 |
|---|---|---|---|---|---|---|
| Module type | | | Local station | Local station | Local station | Local station |
| Transmission method | | | Duplex loop | Duplex loop | Duplex loop | Single bus |
| Transmission path | | | Token ring | Token ring | Token ring | Token bus |
| Synchronisation method | | | Frame synchronisation method | Frame synchronisation method | Frame synchronisation method | Frame synchronisation method |
| Modulation | | | NRZI (Non Return to Zero Inverted) | NRZI (Non Return to Zero Inverted) | Manchester | Manchester |
| Link points per connection | | | 2 x W + (B+Y)/8 ≤ 2000 bytes | 2 x W + (B+Y)/8 ≤ 2000 bytes | 2 x W + (B+Y)/8 ≤ 2000 bytes | 2 x W + (B+Y)/8 ≤ 2000 bytes |
| Link devices | | | 8192 link relays / registers | 8192 link relays / registers | 8192 link relays / registers | 8192 link relays / registers |
| Transmission format | | | Conforms to HDLC | Conforms to HDLC | Conforms to HDLC | Conforms to HDLC |
| Max. link points in one system | | | Max. 239 | Max. 239 | Max. 239 | Max. 239 |
| Stations per network | | | Max. 64 | Max. 64 | Max. 64 | Max. 32 |
| Max. number of local station groups | | | 9 | 9 | 9 | 9 |
| Trans-mission | type/medium | | Optical (SI 200/220, QSI 185/230) | Optical (GI 62.5/125) | Electrical | Electrical |
| | rate | Mbit/s | 10 / acc. to 20 multiplex | 10 / acc. to 20 multiplex | 10 / acc. to 20 multiplex | 100 |
| | distance between 2 stations | m | SI 200/220: 500 m, QSI 185/230: 1000 m | GI 62,5/125: 1000 m | 3C-2V: 300 m, 5C-2V: 500 m, 2500 with Repeater | 3C-2V: 300 m, 5C-2V: 500 m, 2500 with Repeater |
| | cable | | Fibre optics | Fibre optics | Coaxial cable | Coaxial cable |
| | connectors | | CA7003 for SI cable, CA7003 for QSI cable | CA9103S for GI cable | BNC-P-5 / BNC-P-3-NI or equivalent | BNC-P-5 / BNC-P-3-NI or equivalent |
| Error detection | | | CRC based and overflow | CRC based and overflow | CRC based and overflow | CRC based and overflow |
| Boards per PC | | | Max. 4 | Max. 4 | Max. 4 | Max. 4 |
| Internal current consumption (5 V DC) | | A | 1.3 | 1.3 | 1.3 | 1.3 |
| Weight | | kg | 0.5 | 0.5 | 0.5 | 0.5 |
| Dimensions | | mm | ISA bus board | ISA bus board | ISA bus board | ISA bus board |
| **Order information** | | Art. no. | 126888 | 126887 | 128856 | 126889 |

| | | | |
|---|---|---|---|
| **Accessories** | Optical fibre cable, SI type | 5 m: AS-2P-5M-A, art. no. 62430; 30 m: AS-2P-30M-A, art. no. 52353; 50 m: AS-2P-50M-A, art. no. 62457; up to 1000 m on request | Terminating resistor: BNC-75 OHM, art. no.: 53871 |

# The MELSECNET(II) Network

## Data communications

MELSECNET(II) enables cyclic data exchange between personal computers and MELSEC programmable logic controllers of the AnSH, QnAS, AnA/U and QnA series. The network also supports the integration of remote I/O modules. A subordinate MELSECNET(II) or MELSECNET/B network can be connected to a MELSECNET(II) configuration.

## Structure

The loop architecture of MELSECNET(II) enables the configuration of large networks with a coverage of up to 10 km.

## Cable type

The network supports two different cable types:

- Coaxial duplex loop (max. 10 km)
- Fibre-optics duplex loop (max. 10 km)

## Data exchange

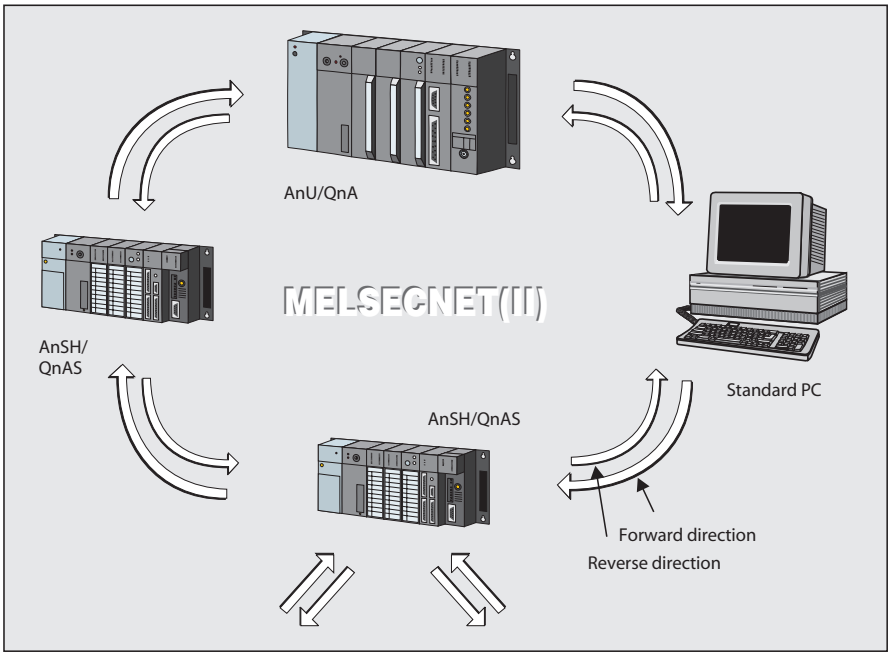
The network supports a large cyclic data exchange volume of 1024 (4096) words and 1024 (4096) relays.

## Administration

In parallel to the cyclic data exchange you can also program and monitor every slave PLC in the system from the master PLC. The Master/Slave procedure ensures extremely efficient network management. Cable breaks are registered automatically and continued operation is ensured by the redundant data cable.

## Special features

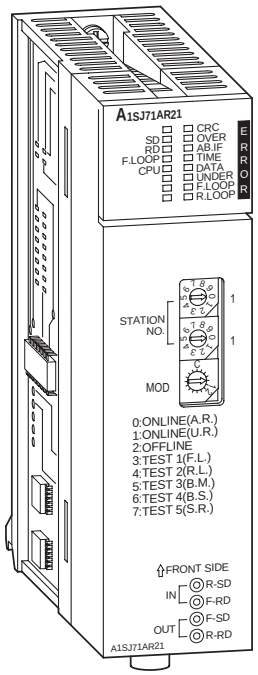
MELSECNET(II) is very simple to install. The only parameters that need to be entered are in a table for the master station specifying the data available for the cyclic data exchange process.




| Data | | | Electrical | Optical | | |
|---|---|---|---|---|---|---|
| Cable type | | | Coaxial duplex loop | Glass fibre SI200/250 µm | Glass fibre GI50/120 µm | Glass fibre GI62,5/125 µm |
| Trans-mission | rate | Mbit/s | 1.25 | 1.25 | 1.25 | 1.25 |
| | distance between 2 stations | m | 500 | 1000 | 2000 | 2000 |
| | total coverage | m | ≤10000 | ≤10000 | ≤10000 | ≤10000 |
| Media | impedance (100 kHz) | Ω | 75 | — | — | — |
| | transmission losses | | — | ≤5.5 dB / km | ≤3 dB / km | ≤3 dB / km |
| | transmission band width | | — | ≥20 MHz / km | ≥300 MHz / km | ≥300 MHz / km |
| **Connectors** | | | | | | |
| Connection system | | | RG59 | CA7003 | CA9003S | CA9003S |
| **Order information** | | Art. no. | — | 69365 | 29603 | 29603 |

| Cable type | Layout | Max. length | Order information | Art. no. |
|---|---|---|---|---|
| SI cable | Connection plugs at both ends; 2-conductor type for interior installation; simple cable protection | Fixed length 2 m | AS-2P-2M-A | 126228 |
| | | Fixed length 5 m | AS-2P-5M-A | 62430 |
| | | Fixed length 30 m | AS-2P-30M-A | 52353 |
| | | Fixed length 50 m | AS-2P-50M-A | 62457 |
| GI cable GI62,5/125 µm | Connection plugs at both ends; 2-conductor type for interior installation; simple cable protection | Fixed length 5 m | AGS-2P-05 M-625A | 104330 |
| GI cable GI50/125 µm | | Fixed length 5 m | AG-2P-5M-A | 38784 |
| GI cable GI50/125 µm | Adapter cable from Hitachi CA9103S plug – ST plug | Fixed length 4 m | AGS-CS-4M-50A | 58630 |
| GI cable GI62,5/125 µm | | Fixed length 3 m | AGS-CS-3M-625A | 58632 |
| | | Fixed length 4 m | AGS-CS-4M-625A | 58631 |

## ■ MELSECNET(II) Modules




### Communication with redundant coaxial cable

MELSECNET(II) permits a dual communication line. One is in the standby mode and maintains the communication in the event of an error on the active line (cable break).

### Special features:

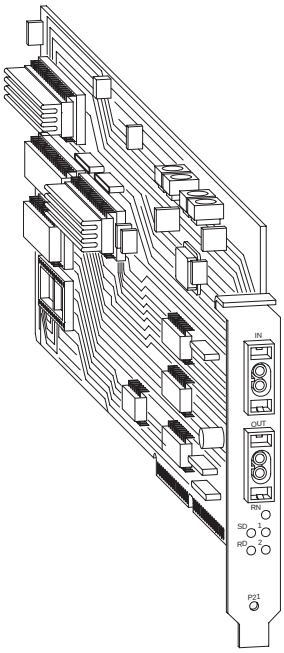
- Ring topology with coaxial or optical cable as transmission line
- Very simple start-up of cyclic and acyclic communication
- Loopback function in the event of failure of a local station
- Central programming and program monitoring of all stations in the network
- Extensive diagnostics facilities via peripherals or internal register

| Specifications | | | A1SJ71AR21 | A1SJ71AP21 |
|---|---|---|---|---|
| Module type | | | Master / slave | Master / slave |
| Communications method | | | Half duplex | Half duplex |
| Synchronisation | | | Frame synchronisation method | Frame synchronisation method |
| Transmission channel | | | Duplex loop | Duplex loop |
| Link register | | | 4096 (0 – FFF) | 4096 (0 – FFF) |
| Max. cyclic data for link in one station | | | ≤ 2 048 | ≤ 2048 |
| Stations per network | | | 65 (1 master/64 slaves) | 65 (1 master/64 slaves) |
| Modulation method | | | CMI | CMI |
| Transmission format | | | Conforms to HDLC | Conforms to HDLC |
| Remote I/O points | | | 512 | 512 |
| Transmission | rate | Mbit/s | 1.25 | 1.25 |
| | distance | m | 500, max. total length 10000 | 1000, max. total length 10000 |
| Cable type | | | RG59B/U | SI200/250µm |
| Max. compensation time during power failure | | ms | ≤ 10 | ≤ 10 |
| I/O points | | | 32 | 32 |
| Internal power consumption (5 V DC) | | mA | 630 | 330 |
| Weight | | kg | 0.33 | 0.3 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |

| Order information | Art. no. | 42069 | 42323 |
|---|---|---|---|

| Accessories | Optical fibre cable with attached connectors; SI type: | 2 m: AS-2P-2M-A, art. no. 126228, 5 m: AS-2P-5M-A, art. no. 62430;<br>30 m: AS-2P-30M-A, art. no. 52353; 50 m: AS-2P-50M-A, art. no. 62457; up to 1000 m on request |
|---|---|---|

## ■ Interface Boards for MELSECNET (II)




### Interface boards for MELSECNET (II)

These interface boards enable you to integrate personal computers into a MELSECNET (II) network.

### Special features:

- Very high-speed data rates between personal computers and controller, faster than ETHERNET
- Access to all data in the entire network
- The PC can access all other CPUs
- Available for both coaxial and fibre-optics cables

| Specifications | | | A7BDE-J71AP21 | A7BDE-J71AR21 |
|---|---|---|---|---|
| Module type | | | Master / slave | Master / slave |
| Transmission method | | | Half duplex, bit serial | Half duplex, bit serial |
| Max. link points in one system | | | 4.096 link relay / register | 4.096 link relay / register |
| Transmission format | | | Conforms to HDLC | Conforms to HDLC |
| Demodulation method | | | CMI | CMI |
| Number of linkable networks | | | Max. 65 | Max. 65 |
| Stations per network | | | 1 Master, up to 64 slaves | 1 Master, up to 64 slaves |
| Transmission | rate | Mbit/s | 1.25 | 1.25 |
| | distance between 2 stations | m | Max. 1000; overall max. 10000 | Max. 500; overall max. 10000 |
| | cable | | Fibre-optics cable | Coaxial cable |
| | type | | SI200 / SI250 µm | RG59 BU / RG6 AU |
| | connector | | CA9003 | BNC-P-5 / BNC-P-3-NI |
| Boards per PC | | | 1 | 1 |
| Internal current consumption (5 V DC) | | A | 0.9 | 1.3 |
| Weight | | kg | 0.4 | 0.4 |
| Dimensions (W x H x D) | | mm | 362 x 143 x 30 (long AT-bus slot) | 362 x 143 x 30 (long AT-bus slot) |
| **Order information** | | Art. no. | 29622 | 29621 |

| Accessories | | |
|---|---|---|
| | Device driver and test software: | SW1-IM-M NET, art. no. 32191 |
| | Optical fibre cable with attached connectors; SI type: | 2 m: AS-2P-2M-A, art. no. 126228, 5 m: AS-2P-5M-A, art. no. 62430;<br>30 m: AS-2P-30M-A, art. no. 52353; 50 m: AS-2P-50M-A, art. no. 62457; up to 1000 m on request |

# The MELSECNET/B Network

## Data communications

MELSECNET/B is an extremely cost-effective network, providing cyclic data communication for MELSEC AnSH, QnAS, AnU and QnA controllers. You can also integrate remote I/O modules in the network. A lower-level MELSECNET(II) or MELSECNET/10 network can be connected to a MELSECNET/B configuration.

## Structure

The bus cable can be up to 1200 m long, depending on the data transfer rate.

Up to 32 stations can be connected to one network.

## Cable type

This network type uses shielded twisted-pair cabling as the data transfer medium (2 pairs).

## Data exchange

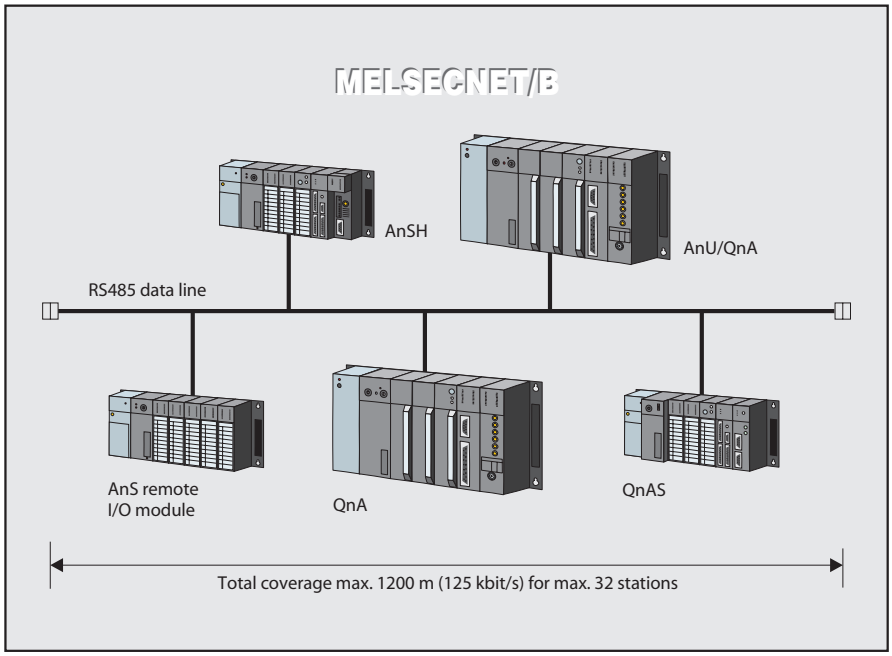
MELSECNET/B's cyclic data exchange provides an excellent data volume of 1024 (4096) words and 1024 (4096) relays, depending on the master PLC used: 1024 relays and words with the CPU types A1S, A1S-S1, A2S, and 4096 relays and words with all other CPU types.

## Administration

In parallel to the cyclic data exchange you can also program and monitor every slave PLC in the system from the master PLC. The Master/Slave procedure ensures extremely efficient network management.

## Special features

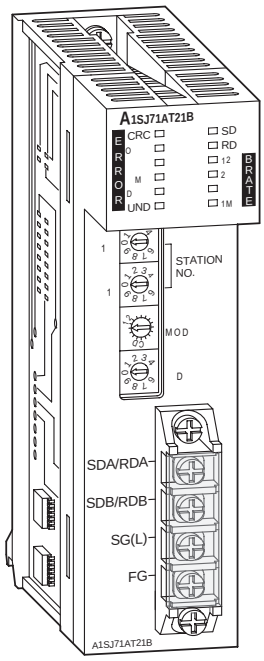
MELSECNET/B is very simple to install. The only parameters that need to be entered are in a table for the master station specifying the data available for the cyclic data exchange process.




| Interface | RS485 |
|---|---|
| Cable type | Shielded twisted-pair |
| No. of pairs | 2 |
| DC resistance | 39.4 Ω / km |
| Insulation resistance (20°C) | 10 MΩ / km |
| Electrostatic capacity (1kHz) | 70 nF / m or less |
| Impedance (100 kHz) | 110 Ω ±10 Ω |

Cable recommendation: Lappkabel Unitronic-Li2YCYv(TP)/AWG20 2x2x0,50

## ■ MELSECNET/B Module




### Communication with economical two-wire line

MELSECNET/B makes it possible to establish an integrated system of up to 32 MELSEC PLC systems via an RS485 interface.

### Special features:

- Bus topology with shielded two-wire line as transmission medium
- Very simple start-up of cyclic and acyclic communication
- Automatic data exchange with MELSECNET(II) and MELSECNET/10 possible
- Central programming and program monitoring of all stations in the network
- Extensive diagnostics facilities via peripherals or internal register
- Remote I/Os can be connected to the network by installing the module A1SJ72T25B as a slave in the PLC CPU location of the main base unit.

| Specifications | | | A1SJ71AT21B | A1SJ72T25B |
|---|---|---|---|---|
| Module type | | | Master / slave | Slave (remote I/O link module) |
| Communications method | | | Half duplex | Half duplex |
| Topology | | | Bus | Bus |
| Synchronisation | | | Frame synchronisation method | Frame synchronisation method |
| Link register / bus | | | 4096 (0 – FFF) | 4096 (0 – FFF) |
| Max. cyclic data for link in one station | | | ≤ 2048 | ≤ 2048 |
| Stations per network | | | 32 | 32 |
| Modulation method | | | NRZI | NRZI |
| Transmission format | | | Conforms to HDLC | Conforms to HDLC |
| Remote I/O points | | | 512 | 512 |
| Transmission | rate | kbit/s | 125 / 250 / 500 / 1000 | 125 / 250 / 500 / 1000 |
| | distance | m | 1200 / 600 / 400 / 200 (depends on the transmission rate) | 1200 / 600 / 400 / 200 (depends on the transmission rate) |
| | cable | | Shielded twisted-pair | Shielded twisted-pair |
| Max. compensation time during power failure | | ms | ≤ 20 | ≤ 20 |
| I/O points | | | 32 | — |
| Internal power consumption (5 V DC) | | mA | 660 | 660 |
| Weight | | kg | 0.22 | 0.4 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 | 54.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 25723 | 47871 |

# The CC-Link Network

## Data communications

The MELSEC CC-Link network provides fast data communications with different devices. The following components among others can be integrated:

- Remote digital inputs/outputs
- Remote analogue inputs/outputs
- High-speed counters
- Positioning modules
- Modules for temperature measurement
- Distributed intelligence (e.g. FX2N)
- Frequency inverters (e.g. FR-A 540)
- Operator terminals (e.g.. GOT)
- Third party devices like gateways, solenoid valves, barcode readers, etc.

## Structure

The maximum bus segment extension is 1,200 m (at 156 kbit/s max.). With a reduced extension, transfer rates of up to 10 Mbit/s can be achieved.

## Cable types

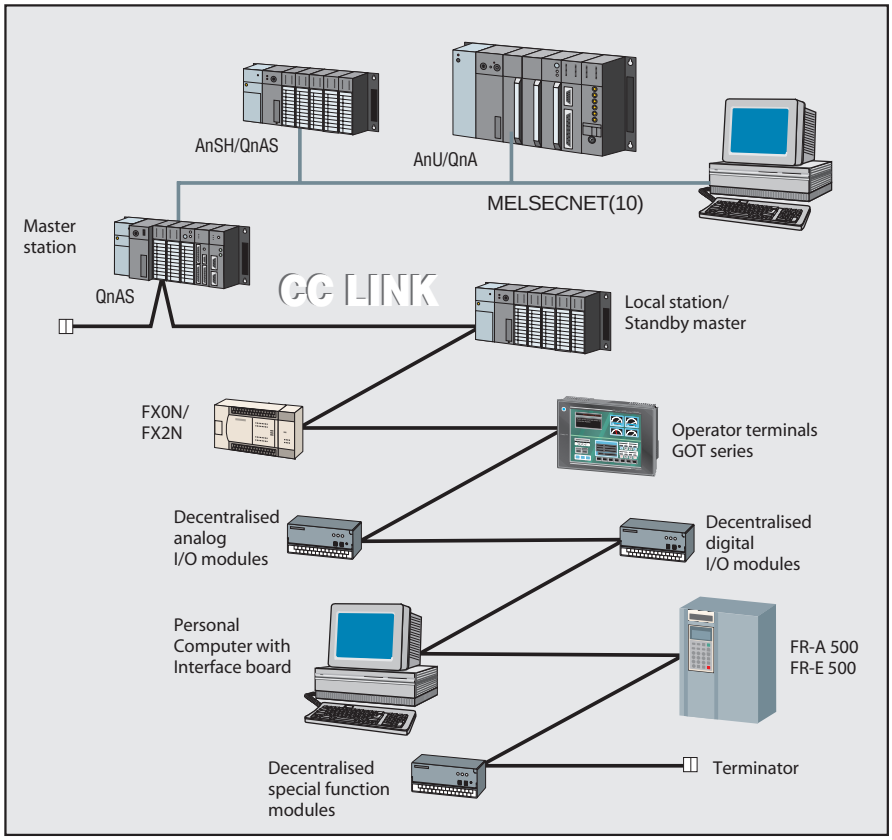
The data communications requires standardized shielded twisted-pair cable.

## Data exchange

Various data like digital and analogue data can be exchanged easily. In addition to the cyclic transmission of word data, CC-Link systems handle transient transmission (message transmission) as well. This enables data communication with intelligent devices such as display devices, bar code readers, measuring devices, and personal computers.

## Administration

The programming software packages MELSEC MEDOC *plus* and MELSEC MEDOC GPP/WIN ensure an easy setup and commissioning.

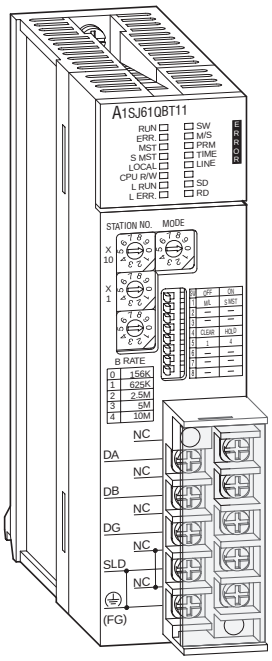



Various special features provide a particular economic network administration:

- Automatic online return function after the removal of a unit from the network.
- Stand-by master function for redundancy across the system.
- Automatic link cutoff function of a faulty slave station without interrupting network communications.
- Link status confirmation.
- Extensive test and diagnostics functions.

| Cabel | Shielded twisted-pair |
|---|---|
| Diameter | 0,5 mm² (1 pair) |
| Cable resistance (20 °C) | ≤37,8 Ω / km |
| Electrostatic capacity (1kHz) | 60 nF / km |
| Impedance (1 MHz) | 100 Ω ±15 % |
| Insulation resistance | ≥10.000 MΩ / km |
| Voltage withstand | 500 V DC for 1 minute |
| Maximal distance | 1.200 m |

## ■ CC-Link Master Module




### Connection of remote inputs/outputs

The CC-Link enables the control and monitoring of I/O modules on a remote machine. The data is transferred to the central controllers via the master module.

### Special features:

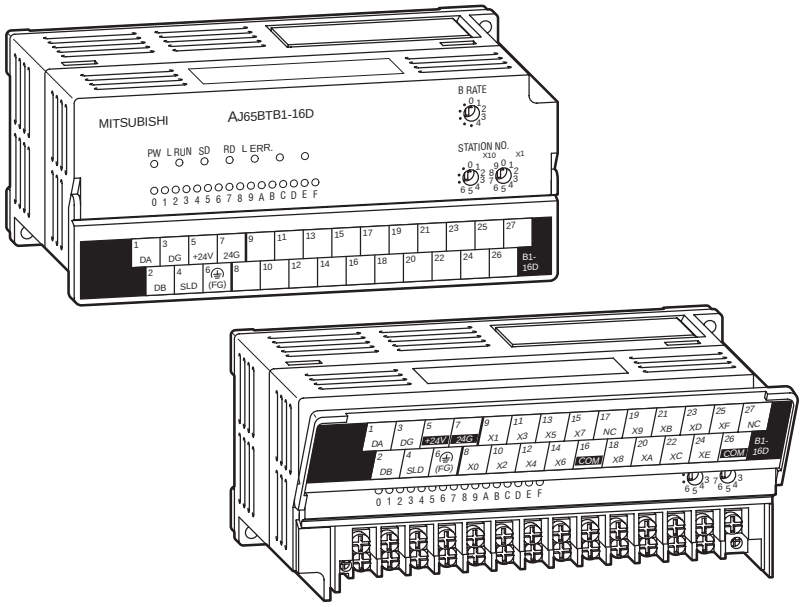
- The parameters of all modules across the network are set directly via the master module.
- The communication between the remote modules and the master module is performed automatically (refresh rate of up to 3.9 ms for 2048 I/O points).
- With one master module a system can be extended by up to 2048 remote I/O points.
- An additional stand-by master establishes a duplex system.
- Automatic link cutoff function of a faulty slave station without interrupting network communications.
- Automatic online return of a station after error corrective action without network reset.
- Data transfer via shielded twisted pair cable.

| Specifications | | | A1SJ61BT11 | A1SJ61QBT11 |
|---|---|---|---|---|
| Module type | | | Master / Local Station | Master / Local Station |
| CPU series | | | MELSEC AnS series | MELSEC QnAS series |
| Link points per station | I/O points | | 32 | |
| | register | | 8 | |
| Decentral I/O points | | | 2048 | |
| Number of connectable modules | | | Max. 64 (Remote I/O modules: max. 64; Remote special function modules: max. 42; local stations: max. 24) | |
| I/O refresh time | | ms | 3.9 – 6.7 | |
| Transmission | speed | Mbit/s | 10; 5; 2.5; 0.62; 0.15 | |
| | type | | Bus | |
| | distance | m | 100 m at 10 Mbit/s; 150 m at 5 Mbit/s; 200 m at 2.5 mbit/s; 600 m at 0,62 Mbit/s; 1200 m at 0.15 Mbit/s | |
| | total distance | m | Max. 1200m | |
| Synchronizations method | | | Frame synchronisation | |
| Modulation | | | NRZI | |
| Tramsmission route type | | | Bus (RS485) | |
| Transmission format | | | HDLC | |
| Transmission cable | type | | Shielded twisted-pair | |
| | no. of cores | | 2 | |
| | cable resistance (20 °c) | | Max. 37.8 Ω/km | |
| | insulation resistance (1 kHz) | | Max. 60 nF/km | |
| | characteristic impedance (100 kHz) | | 100 ±15Ω | |
| | cable resistance (20 °C) | | 10000 MΩ/km | |
| | diameter | | 0.5 mm² | |
| I/O points | | | 32 | |
| Internal power consumption (5 V DC) | | mA | 400 | |
| Weight | | kg | 0.25 | |
| Dimensions (W x H x D) | | mm | 37.5 x 130 x 93.6 | |

| Order information | Art. no. | 75497 | 126738 |
|---|---|---|---|

| Accessories | Programming software: MELSEC MEDOC *plus* or MELSEC MEDOC GPP/WIN (see page 92) |
|---|---|

## CC-Link Remote Digital Input and Combination Modules




### Remote inputs

The remote input modules acquire the signals within short distance from the machine. The advantage is a reduced cabling requirement and the capability of aquiring data and operation results of individual machine modules autonomously, electrically, and mechanically.

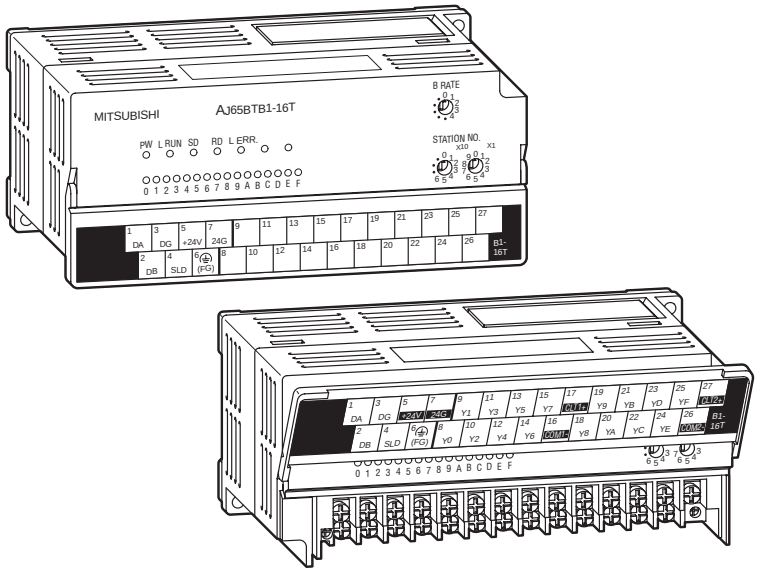
Besides three different input modules with up to 32 inputs, a combined module with 8 inputs and 8 outputs is available.

### Special features:

- Up to 64 I/O modules with a maximum of 32 inputs each can be connected.
- All modules are very compact.
- Tough, highly shock-resistant pattern.
- Status indicator LEDs for the inputs.
- Standard electrical isolation between process and control via optocouplers.
- Mounting with DIN rail adapters or screws.
- Modules can be mounted in horizontal arrangement or in one of 4 orientations on a flat surface.

| Specifications | | | AJ65BTB1-16D | AJ65BTB2-16D | AJ65BTC1-32D | AJ65BTB1-16DT |
|---|---|---|---|---|---|---|
| Module type | | | Input modules | | | Combination module |
| Inputs | | | 16 | 16 | 32 | 8 |
| Outputs | | | — | — | — | 8 |
| Input type | | | DC input (sink / source type) | DC input with 8 potential terminals (sink / source type) | DC input (sink / source type) | DC input (sink type) |
| No. of points per module | | | 16 | 16 | 32 | 8 |
| Output type | | | — | — | — | Transistor |
| No. of points per module | | | — | — | — | 8 |
| Insulation type | | | All modules feature photocoupler insulation. | | | |
| Input voltage | | | 24 V DC | 24 V DC | 24 V DC | 24 V DC |
| Input current | | mA | 7 | 7 | 7 | 7 |
| Max. output current | per output | | — | — | — | 0,5 |
| | per group | | — | — | — | 4 |
| Damping voltage | ON voltage | V | ≥ 14 | ≥ 14 | ≥ 14 | ≥ 14 |
| | OFF voltage | V | ≤ 6 | ≤ 6 | ≤ 6 | ≤ 6 |
| Response time | OFF ⟶ ON | ms | ≤ 2 | ≤ 2 | ≤ 2 | ≤ 10 |
| | ON ⟶ OFF | ms | ≤ 2 | ≤ 2 | ≤ 2 | ≤ 12 |
| Status display of inputs | | | All modules provide LEDs for each input. | | | |
| Error (RUN) display of stations | | | LED | LED | LED | LED |
| I/O points | | | 16 | 16 | 32 | 16 |
| Connection terminals | | | Terminal block | Terminal block | Connector | Terminal block |
| Applicable wire size | | $mm^2$ | 0.75 – 2.0 | 0.75 – 2.0 | 0.75 – 2.0 | 0.75 – 2.0 |
| Internal power consumption | | mA | 60 | 60 | 70 | 70 |
| Weight (without terminal block) | | kg | 0.32 | 0.4 | 0.27 | 0.33 |
| Dimensions (W x H x D) | | mm | 151.9 x 65 x 46 | 197.4 x 65 x 46 | 165 x 65 x 46 | 151.9 x 65 x 46 |
| **Order information** | | Art. no. | 75447 | 75450 | 75455 | 75448 |

## CC-Link Remote Digital Output Modules




### Remote outputs

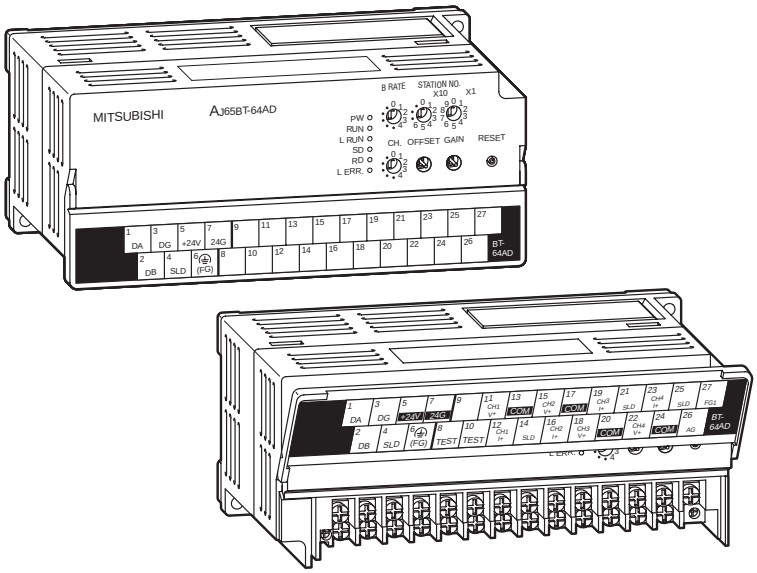
The remote output modules output the signals within short distance to the machine. The advantage is a reduced cabling requirement and the capability of controlling and monitoring data and operation results of individual machine modules autonomously, electrically, and mechanically.

### Special features:

- Up to 64 I/O modules with a maximum of 32 outputs each can be connected.
- All modules are very compact.
- Tough, highly shock-resistant pattern.
- Status indicator LEDs for the outputs.
- Standard electrical isolation between process and control via optocouplers.
- Mounting with DIN rail adapters or screws.
- Modules can be mounted in horizontal arrangement or in one of 4 orientations on a flat surface.

| Specifications | | | AJ65BTB1-16T | AJ65BTC1-32T | AJ65BTB2-16R |
|---|---|---|---|---|---|
| Module type | | | Output modules | | |
| Outputs | | | 16 | 32 | 16 |
| Output type | | | Transistor | Transistor | Relay |
| No. of points per module | | | 8 | 32 | 8 |
| Insulation type | | | All modules feature photocoupler insulation. | | |
| Output rated voltage | | | 12/24 V DC | 12 /24 V DC | 24 V DC<br>240 V AC |
| Max. output current | per output | A | 0.5 | 0.1 | 2 |
| | per group | A | 4 | 2 | 8 |
| Leak current output OFF | | | | | |
| Response time | OFF ⟶ ON | ms | ≤ 2 | ≤ 2 | ≤ 10 |
| | ON ⟶ OFF | ms | ≤ 2 | ≤ 2 | ≤ 12 |
| Overvoltage protection | | | Zener diode | Clamp diode | — |
| Status display of outputs | | | All modules provide LEDs for each output. | | |
| Error (RUN) display of stations | | | LED | LED | LED |
| I/O points | | | 16 | 32 | 16 |
| Connection terminals | | | Terminal block | Connector | Terminal block |
| Applicable wire size | | $mm^2$ | 0.75 – 2.0 | 0.75 – 2.0 | 0.75 – 2.0 |
| Internal power consumption | | mA | 80 | 115 | 85 |
| Weight (without terminal block) | | kg | 0.34 | 0.28 | 0.47 |
| Dimensions (W x H x D) | | mm | 151.9 x 65 x 46 | 165 x 65 x 46 | 197.4 x 65 x 46 |
| **Order information** | | Art. no. | 75449 | 75456 | 75453 |

## CC-Link Remote Analog Input Modules




### Analog linking to the CPU

The analog input module AJ65BT-64AD converts analog process signals into digital values that can be processed by the CPU.

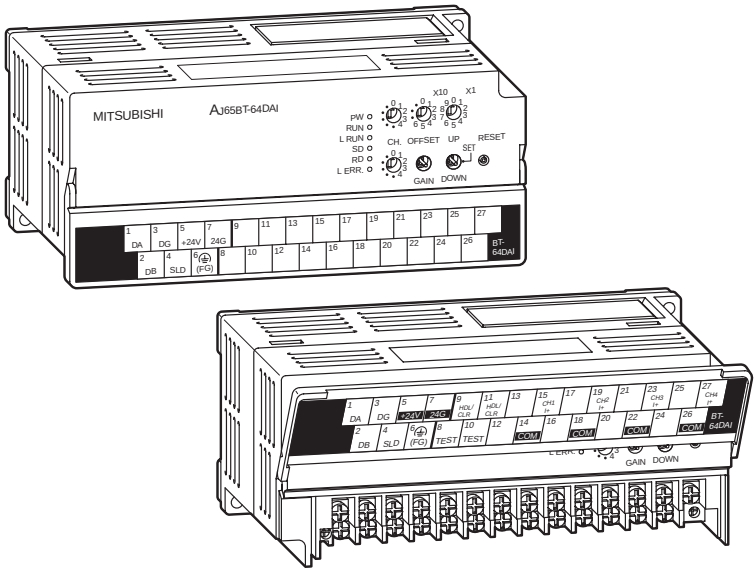
### Special features:

- 4 analog input channels per module.
- Selectable current or voltage input.
- Resolution 5 mV and 20 mA.
- Converting time 1 ms per channel.
- Converts analogue values in the range of -10 to 10 V or -20 to +20 mA into digital values from -2000 to +2000.
- Status indicator LEDs.
- Standard electrical isolation between process and control via optocouplers.
- Input characteristics can be user-modified via offset/gain settings.
- Ready for use with all CC-Link master modules.

| Specifications | | AJ65BT-64AD | | | |
|---|---|---|---|---|---|
| Analog inputs | | 4 | | | |
| Resolution | | 16 bit, -2048 / +2047 | | | |
| I/O characteristics | | **Analog input** | | **Digital output** | |
| | | Voltage | Current | Voltage | Current |
| | | -10 V – 10 V<br>0 – 10 V<br>0 – 5 V<br>1 – 5 V | -20 – 20 mA<br>0 – 20 mA<br>0 – 20 mA<br>4 – 20 mA | 0 – 4000<br>0 – 4000<br>0 – 4000<br>0 – 4000 | -2000 – 2000<br>-2000 – 2000<br>-2000 – 2000<br>-2000 – 2000 |
| Max. resolution | | -10 V – 10 V<br>0 – 10 V<br>0 – 5 V<br>1 – 5 V | -20 – 20 mA<br>0 – 20 mA<br>0 – 20 mA<br>4 – 20 mA | 5 mV<br>2.5 mV<br>1.25 mV<br>1 mV | 20 µA<br>10 µA<br>5 µA<br>4 µA |
| Overall accuracy | | ±1.0 % (for the whole measurement range) | | | |
| Max. conversion time | | 1 ms/channel | | | |
| Max. input | voltage | ±15 V | | | |
| | current | ±30 mA | | | |
| Isolation | | Photocoupler isolation between output terminals and PC power for all modules. | | | |
| I/O points | | 2 stations (each 32 devices) | | | |
| External power consumption | | 24 V DC | | | |
| Applicable wire size | $mm^2$ | 0.75 – 2.00 | | | |
| Internal power consumption (24 V DC) | mA | 120 | | | |
| Weight | kg | 0.35 | | | |
| Dimensions (W x H x D) | mm | 152 x 65 x 63 | | | |

| Order information | Art. no. | 75444 |
|---|---|---|

## ■ CC-Link Remote Analog Output Modules




### Digital to analog converter modules

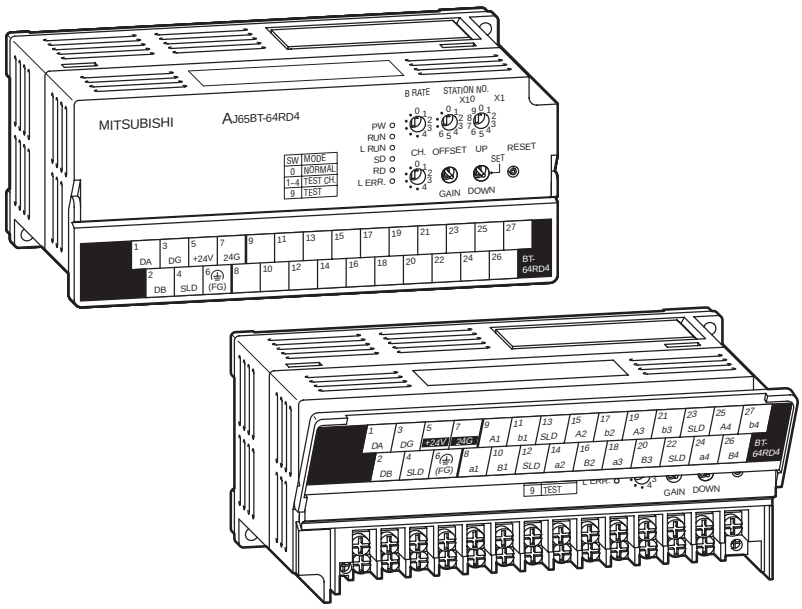
These modules serve as remote 4-channels digital to analog converter modules with 12-bit or 13-bit binary resolution and output an analog current or voltage signal. With this signal for example, frequency inverters, valves or sliders can be controlled.

### Special features:

- Up to 4 channels per module.
- Resolution of the digital input signals selectable in 3 steps: 1/4000, 1/8000, 1/12000.
- Gain and offset setting provided for each channel.
- Converting time of 1 ms per channel and 4 ms for 4 channels.
- Status indicator LEDs.
- Standard electrical isolation between process and control via optocouplers.
- Ready for use with all CC-Link master modules.

| Specifications | | AJ65BT-64DAV | | AJ65BT-64DAI | |
|---|---|---|---|---|---|
| Analog outputs | | 4 | | 4 | |
| Resolution | | 12 bit, -2048 to +2.047 | | 12 bit, 0 – 4095 | |
| Analog output | | -10 V – 0 V – +10 V DC (external input resistance 2 kΩ – 1 MΩ) | | 4 – 20 mA DC (external input resistance 0 – 600 Ω) | |
| I/O characteristics | | **Digital input** | **Analog output** | **Digital input** | **Analog output** |
| | | Resolution | Voltage | Resolution | Current |
| | | 2000<br>1000<br>0<br>-1000<br>-2000 | +10 V<br>+5 V<br>0 V<br>-5 V<br>-10 V | 4000<br>2000<br>0 | +20 mA<br>+12 mA<br>+4 mA |
| Offset/Gain setting | | Yes (users or factory setting) | | Yes (users or factory setting) | |
| Overall accuracy | | ±1.0 % (for the whole measurement range) | | ±1.0 % (for the whole measurement range) | |
| Max. conversion time | | Max. 1 ms/1 channel, 4 ms/4 channels | | Max. 1 ms/1 channel, 4 ms/4 channels | |
| Isolation method | | All modules fitted with photocoupler isolation between input terminals and internal circuit. | | | |
| I/O points | | 2 stations (32 devices) | | 2 stations (32 devices) | |
| Applicable wire size | $mm^2$ | 0.75 – 2.0 | | 0.75 – 2.0 | |
| Internal power consumption (24 V DC) | mA | 180 | | 270 | |
| Weight | kg | 0.4 | | 0.4 | |
| Dimensions (W x H x D) | mm | 152 x 65 x 63 | | 152 x 65 x 63 | |
| **Order information** | Art. no. | 75446 | | 75445 | |

## ■ CC-Link Remote Analog Input Modules for Pt100-Elements




### Connection of Pt100-elements

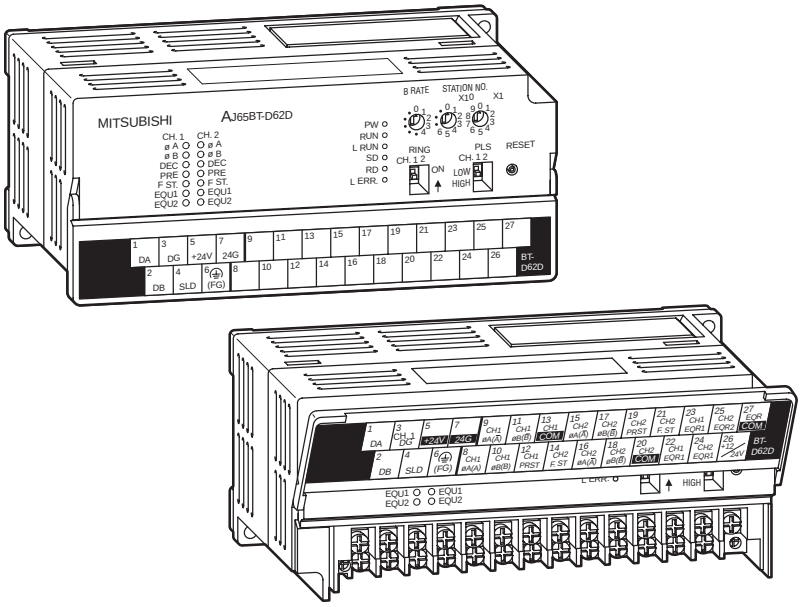
The analog modules AJ65BT-64RD3 and AJ65BT-64RD4 provide analog inputs for measuring values of Pt100 elements.

### Special features:

- Linear measuring range without adjustment of the measuring values.
- Direct output of the measuring values in °C.
- Temperature measuring range of -180°C to +600°C in combination with a Pt100-element according to DIN IEC 751.
- Platinum sensors can be connected directly.
- A line break is indicated to the PLC by the module.
- The conversion can be enabled or disabled for each channel individually.
- Averaging on time or measuring cycles can be parametrized.
- Status indicator LEDs.
- Standard electrical isolation between process and control via optocouplers.
- Ready for use with all CC-Link master modules.

| Specifications | | | AJ65BT-64RD3 | AJ65BT-64RD4 |
|---|---|---|---|---|
| Pt100-input points | | | 4 | 4 |
| Method of measurement | | | 3-wire type | 4-wire type |
| Connectable temperature measuring resistants | | | Pt100 (conforms to JIS C 1604-1989 and DIN IEC 751), JPt100 (conforms to JIS C 1604-1981) | |
| Temperature | Measurement range | °C | -180 – +600 | -180 – +600 |
| | Detected value | | 16 bits signed binary: -1800 – +6000<br>32 bits signed binary: -180000 – +600000 | 16 bits signed binary: -1800 – +6000<br>32 bits signed binary: -180000 – +600000 |
| Overall accuracy | at 25 °C (±5%) | | ±0.1 % (for the whole measurement range) | ±0.1 % (for the whole measurement range) |
| | at <20 °C or > 30 °C | | ±0.25 % (for the whole measurement range) | ±0.25 % (for the whole measurement range) |
| Resolution | | °C | 0.025 | 0.025 |
| Max. conversion time | | | 40 ms / Pt100 input | 40 ms / Pt100 input |
| Isolation | | | Photocoupler isolation between output terminals and PC power for all modules. | |
| Modules per network | | | Max. 16 Pt100 analog input modules in one network | Max. 16 Pt100 analog input modules in one network |
| I/O points | | | 4 stations (128 devices) | 4 stations (128 devices) |
| Applicable wire size | | $mm^2$ | 0.75 – 2.0 | 0.75 – 2.0 |
| External voltage sopply | | | 24 V DC | 24 V DC |
| Internal power consumption (24 V DC) | | mA | 170 | 170 |
| Weight | | kg | 0.38 | 0.38 |
| Dimensions (W x H x D) | | mm | 152 x 65 x 63 | 152 x 65 x 63 |
| **Order information** | | Art. no. | 88026 | 88027 |

## ■ CC-Link Remote High-Speed Counter Modules




### Automatic hardware counter

The high-speed counter modules acquire signals at a frequency which conventional input modules can not acquire. Positioning tasks or frequency measurements for example can be performed.

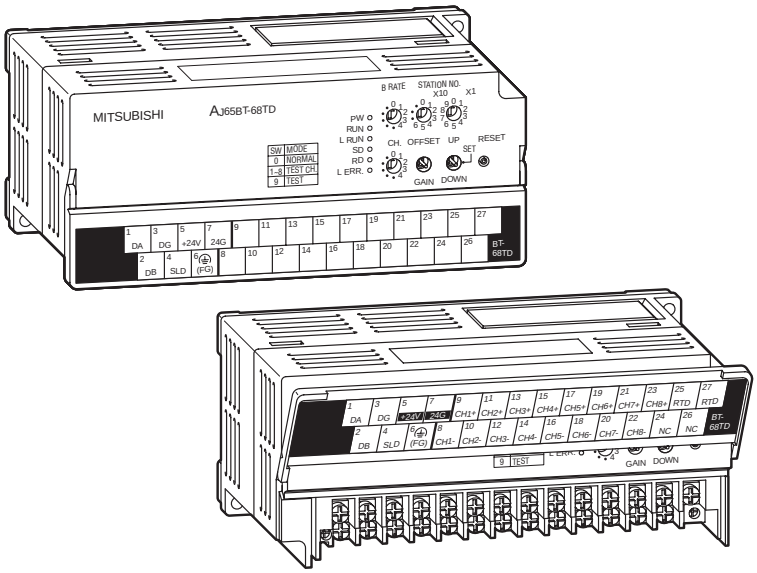
### Special features:

- Input for incremental shaft encoder with automatic forward and reverse detection.
- Count preset via external signals or via the PLC program by the PRESET function.
- Ring counter for counting up to a predefined valuewith automatic reset to the initial value.
- Functions such as velocity measurement, determining switching points or periodical counting are provided.
- Automatic multiplication of the counted values.
- Status indicator LEDs.
- Ready for use with all CC-Link master modules.

| Specifications | | | AJ65BT-D62 | AJ65BT-62D / 62D-S1 |
|---|---|---|---|---|
| Counter inputs | | | 2 (1 or 2 phases) | 2 (1 or 2 phases) |
| Signal levels | | | 5 / 12 / 24 V DC (2 – 5 mA) | EIA Standard, RS-422-A difference driver |
| Max. counting frequency | | pulse/s | 200000 | 400000 |
| Counting range | | | 23 bits + sign (binary), 0 – 16777215 | 23 bits + sign (binary), 0 – 16777215 |
| Comparison range | | | 24 bits + sign (binary) | 24 bits + sign (binary) |
| Counter type | | | Both modules are equipped with UP/DOWN preset counter and ring counter function. | |
| External digital input points | | | Preset, count disable function | Preset, count disable function |
| Min. input pulse width | | | 1 / 2 phase: 5 µs<br>1 phase: 100 µs; 2 phase: 142 µs | 1 phase: 2.5 µs; 2 phase: 3.3 µs;<br>1 phase: 100 µs; 2 phase: 142 µs |
| External | inputs | | 5 / 12 / 24 V DC (2 – 5 mA) | 5 / 12 / 24 V DC (2 – 5 mA) |
| | response time | OFF ⟶ ON | < 0.5 ms | < 0.5 ms |
| | | ON ⟶ OFF | < 3 ms | < 3 ms |
| External | outputs | | 2 A | 2 A |
| | response time | | < 0.1 ms | < 0.1 ms |
| I/O points | | | 4 stations (128 devices) | 4 stations (128 devices) |
| Applicable wire size | | $mm^2$ | 0.75 – 2.0 | 0.75 – 2.0 |
| Internal power consumption (24 V DC) | | mA | 70 | D62D: 100; D62D-S1: 120 |
| Weight | | kg | 0.41 | 0.42 |
| Dimensions (W x H x D) | | mm | 152 x 65 x 63 | 152 x 65 x 63 |

| Order information | Art. no. | 88028 | 88029 / 88030 |
|---|---|---|---|

## ■ CC-Link Remote Input Modul for Temperature Measurement




### Temperature measuring via thermoelement

This module supports temperature measurements via thermocouples.

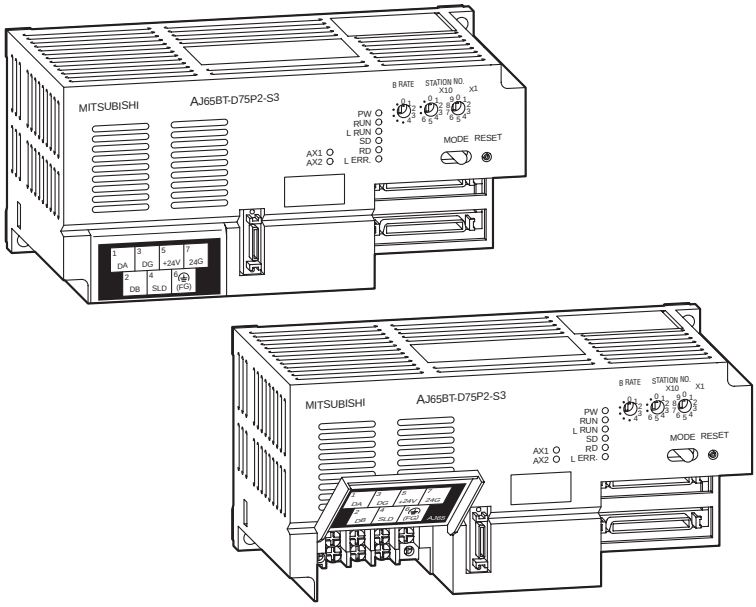
### Special features:

- The module provides 8 thermoelement inputs that can be addressed independently.
- Linearized measuring range up to 1700 °C (depending on thermoelement).
- Support for thermoelement types B, R, S, K, E, J, T with characteristics of thermoelectric voltages according to DIN IEC 584-1.
- Line break detection for each input channel.
- Cold junction compensation is possible.
- Standard electrical isolation between process and control via optocoupler.

| Specifications | | AJ65BT-68TD | | | |
|---|---|---|---|---|---|
| Input points | | 8 | | | |
| Temperature input range | °C | 0 – 1700 | | | |
| Detected temperature value | | 16 bits signed binary: 0 – 17000 (value to the first decimal place x 10) | | | |
| Scaling value | °C | 16 bits signed: 0 – +2000 | | | |
| Thermocouple | | **Type** | **Temperature measurement range** | **Conversion accuracy** (at operating ambient temperature is Ta = 25 ± 5°C) | **Temperature characteristic** (when operating ambient temperature varies by ΔT = 1 °C) |
| | | B | 600 – 1700 °C | ±2.5 °C | ±0.4 °C |
| | | R | 200 – 1600 °C | ±2 °C | ±0.3 °C |
| | | S | 200 – 1600 °C | ±2 °C | ±0.3 °C |
| | | K | 0 – 1200 °C | ±0.5 °C or 0.25 % of the measured temperature which ever is larger | ±0.07 °C or 0.02 % of the measured temperature which ever is larger |
| | | E | 0 – 800 °C | | |
| | | J | 0 – 750 °C | | |
| | | T | 0 – 350 °C | | |
| Cold junction compensation accuracy | | ±1 °C | | | |
| Overall accuracy | | (Conversion accuracy Ta) + (temperature characteristic) x (operating ambient temperature variation) ± 1 °C | | | |
| Max. conversion time | | 45 ms / channel, without respect to the number of used channels | | | |
| Absolute max. input voltage | V | ± 5 | | | |
| Isolation method | | Transformer | | | |
| I/O points | | 4 stations (128 devices) | | | |
| Applicable wire size | $mm^2$ | 0.75 – 2.0 | | | |
| Internal power consumption (5 V DC) | mA | 81 | | | |
| Weight | kg | 0.40 | | | |
| Dimensions (W x H x D) | mm | 152 x 65 x 63 | | | |

| **Order information** | Art. no. | 88025 |
|---|---|---|

## CC-Link Remote Positioning Module




### Positioning with an open control loop

The module generates the go command via a pulse chain. The velocity is proportional to the pulse frequency. The travel is proportional to the pulse length.

### Special features:

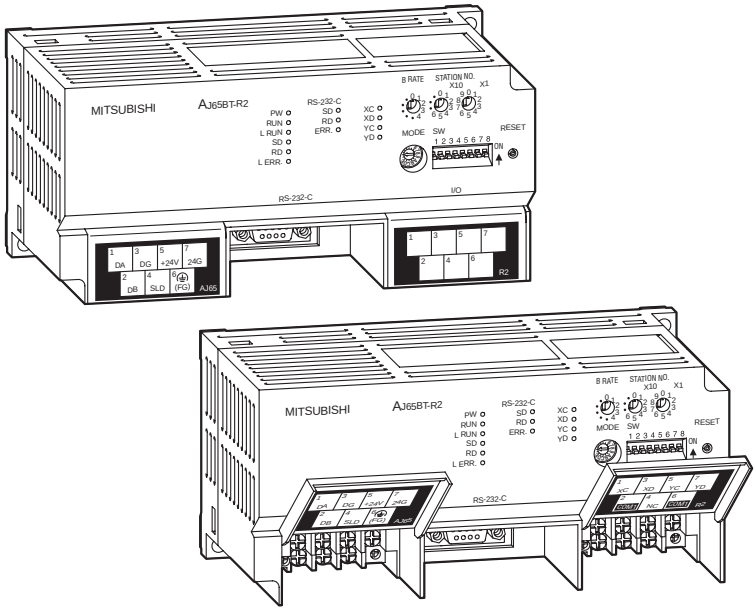
- Control of up to two axes, linear interpolation or circular interpolation.
- Storage of up to 600 items of positioning data.
- Travel unit can be specified pulse, mm, inch or degree.
- In connection with the MELSERVO MR-J2 servo amplifier an absolute position detection system can be configured.
- 7 types of home position return functions are available.
- Parameterization and specification of positioning data can be be done entirely by the PLC program or by the MS-DOS Software SW1IVD-AD75PE.

| Specifications | | AJ65BT-D75P2-S3 |
|---|---|---|
| Control axes | | 2 |
| Interpolation | | Linear interpolation (2 axes), circular interpolation(2 axes) |
| Points per axis | | 600 |
| Positioning | method | Pulse control "Point to Point" (absolute data and/or incremental); speed/position swiching control: (incremental); locus control (absolute data and/or incremental) |
| | positioning units | absolute data: -2147483648 – 2147483647 pulse<br>-214748364.8 – 214748364.7 µm<br>-21474.83648 – 21474.83647 inch<br>0 – 359.99999 degree<br>incremental: -2147483648 – 2147483647 pulse<br>-214748364.8 – 214748364.7 µm<br>-21474.83648 – 21474.83647 degree<br>-21474.83648 – 21474.83647 inch<br>Speed/position switching control: 0 – 2147483647 pulse<br>0 – 214748364.7 µm<br>0 – 21474.83647 degree<br>0 – 21474.83647 inch |
| | positioning speed | 1 – 1000000 pulse/min<br>0.01 – 6000000.00 mm/min<br>0.001 – 600000.000 degree/min<br>0.001 – 600000.000 inch/min |
| | acceleration/ deceleration processing | Automatic trapezoidal or S-pattern acceleration and deceleration |
| | acceleration and deceleration time | 1 – 65535 ms (4 patterns each can be set) |
| Offset | | Electronic gear and backlash compensation |
| I/O points | | 4 stations with each 128 devices |
| Internal power consumption (5 V DC) | mA | 300 |
| Weight | kg | 0.5 |
| Dimensions (W x H x D) | mm | 170 x 63.5 x 80 |

| Order information | Art. no. | 88002 |
|---|---|---|

| Accessories | Software for all MELSEC positioning modules: SW1IVD-AD75PE, art. no.: 65619; adapter cabel: A1SD75-C01H, art. no.: 54943 |
|---|---|

## CC-Link Remote RS232C Interface Module




### Data exchange with peripherals

This module serves for the communication with peripheral devices through a standard RS232C interface. The peripherals are connected point to point (1:1).

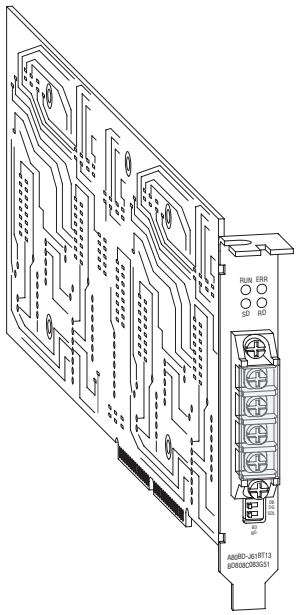
### Special features:

- Access capabilities of host PCs with visualization or monitor software to the complete data set of the MELSEC AnAS CPU.
- Supported ASCII data exchange with connected devices such as bar code readers, weighing or identification systems.
- Two universal digital inputs and outputs each.
- Printer control options.
- LED indicators for the module and communications status.

| Specifications | | | AJ65BT-R2 |
|---|---|---|---|
| Interface | | Typ | RS232C (D-Sub, 9 pole) |
| Communications mode | | | Full duplex (without protocol) |
| Synchronisation | | | Start/stop synchronisation |
| Data transfer | speed | bit/s | 300, 600, 1200, 2400, 4800, 9600, 19200 (selectable) |
| | channel | | Bus (RS485) |
| | distance | m | 15 |
| Data format | | | 1 start bit, 7 or 8 data bits, 1 or 0 parity bits, 1 or 2 stop bits |
| Error correction | | | Parity check, checksum |
| DTR/DSR control | | | YES / NO selectable |
| X ON / X OFF (DC1 / DC3) | | | YES / NO selectable |
| Universal I/Os | input data | | 2 inputs 24 V DC (sink / source type) |
| | output data | | 2 Transistor outputs 12/24 V DC |
| I/O points | | | 1 station (32 adresses) |
| External power supply | | V DC | 24 |
| Internal power consumption (5 V DC) | | mA | 110 |
| Weight | | kg | 0.4 |
| Dimensions (W x H x D) | | mm | 170 x 80 x 63,5 |

| Order information | Art. no. | 88003 |
|---|---|---|

## ■ Interface Boards for CC-Link



### Interface board for CC-Link

The interface board serves for the integration of a personal computer as local station into the CC-Link network.

### Special features:

- PCI board for plug-and-play without DIP switch configuration.
- Monitor and test function of data available within the network supported.
- Prepared for user-defined programming.

| Specifications | | | A80BD(E)-J61BT13 |
|---|---|---|---|
| Module type | | | Slave |
| Transmission speed | | Mbit/s | 0.156; 0.625; 2.5; 5; 10 (selectable) |
| Max. transmission distance | | | Dependend on the transmission speed (see master module) |
| Link devices | per system | | 2048 link relays , 256 registers |
| | per station | | 30 link relays , 256 registers |
| Communications method | | | Polling |
| Synchronisation method | | | Frame synchronisation method |
| Modulation | | | NRZI |
| Transmission method | | | Bus (RS485) |
| Transmission format | | | HDLC |
| Boards per network | | | Max. 4 |
| System requirements (PC) | | | Windows NT Workstation 4.0 or higher, with Pentium prozessor ≥133 MHz, 1 free PCI slot, min. 32 MB RAM, min. 20 MB ROM (harddisk) |
| Internal power consumption (5 V DC) | | mA | 400 |
| Weight | | kg | 0.16 |
| Dimensions (W x H x D) | | mm | 192 x 107 x 8.8 |

| Order information | Art. no. | 102866 |
|---|---|---|

# MELSEC I/O Link Network

## Communications Modules

MELSEC I/O Link enables you to operate up to 64 remote inputs and 64 remote outputs.

All I/Os in the network are automatically and cyclically updated at 5.4 µs intervals.

Up to 16 I/O modules can be connected to a master unit.

## Structure

The data line's tree topology enables you to install T-junctions at any point, similar to a normal house service installation. You only need to ensure that the total coverage of the network does not exceed 200 m.

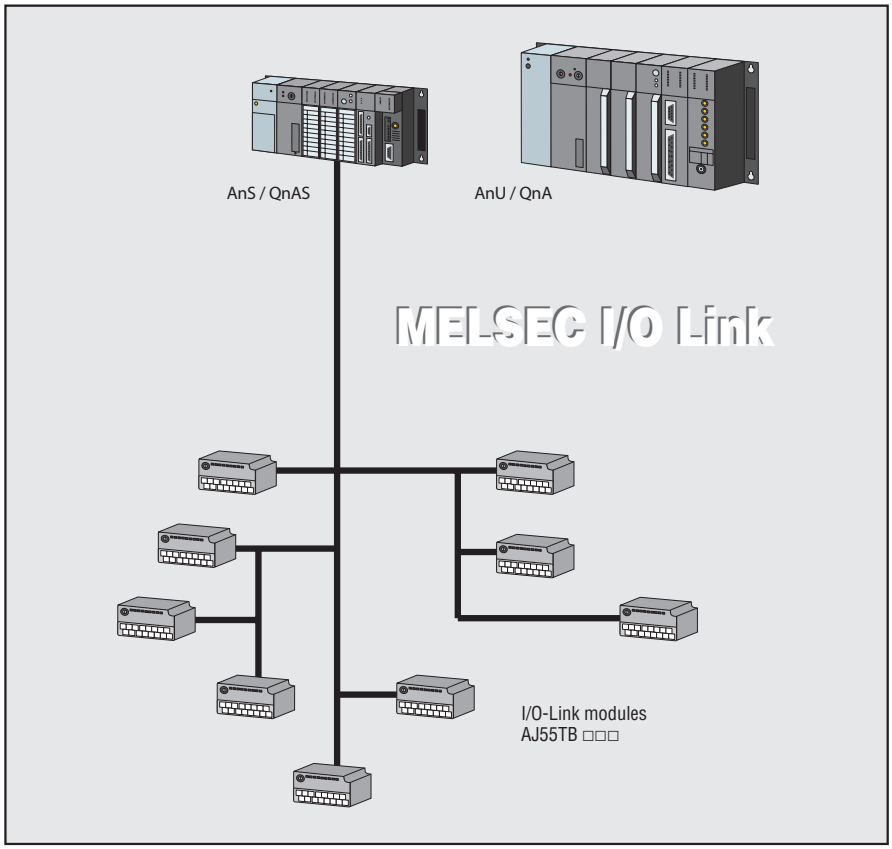
## Cable type

The network uses ordinary shielded twisted-pair cabling as the communications medium.

## Administration

For the control program there is no difference at all between the remote I/Os and the local I/Os on the PLC's base units.

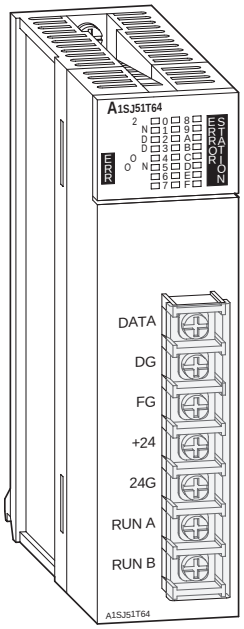
The station numbers of the remote I/O modules are set with simple rotary switches, making installation very easy. You also need to set the master station DIP switches for the assigned station numbers to ON.




| Interface | Shielded twisted-pair cabling |
|---|---|
| Cross-section | 0.75 mm² (1 pair) |
| Loop resistance | ≤ 29 Ω / km |
| Electrostatic capacity | 75 nF / km |
| Impedance (100 kHz) | 110 Ω ±10 % |
| Insulation resistance | ≥ 500 MΩ / km |
| Maximum distance | 200 m |

Important: Do not exceed the specified electrostatic capacity!

## ■ MELSEC I/O Link Master Module




### Local I/Os with flexible installation

The MELSEC I/O Link is very simple to handle.
To put it into operation, all that is necessary is to set DIP switches to indicate which stations are present. Otherwise, the local I/Os behave in the same way as locally installed ones and are programmed in the same way via the PLC program.

### Special features:

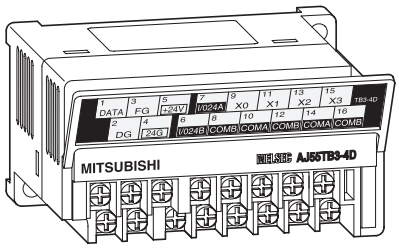
- Online diagnostics by means of LEDs
- Cabling in tree structure (T connections possible)
- Up to 128 inputs/outputs per module
- Refresh time of 5.4 ms for 64 I/Os
- The number of master modules is limited only by the address range of the CPU.
- Transmission distance up to 200 m (cable length)
- Indication of faulty stations by means of LEDs

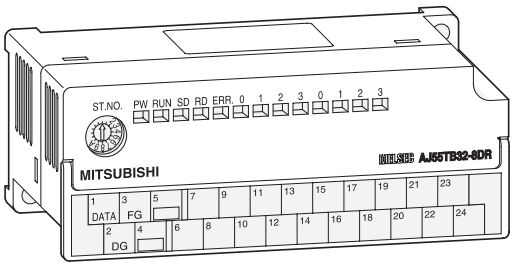
| Specifications | | | A1SJ51T64 |
|---|---|---|---|
| Controllable I/O points | | | 128 (using mixed modules with 4 inputs / 4 outputs) |
| I/O refresh time | | ms | ca. 5.4 |
| Communication | rate | bit/s | 38400 |
| | method | | Register insertion method |
| | synchronization method | | Combination of frame-synchronization and bit-synchronization |
| | error control system | | Parity check |
| | transmission path | | Bus / tree system |
| | transmission total distance | m | 200 |
| | I/O stations | | 16 (modules with 4 I/Os) |
| Communication cable | type | | Shielded twisted pair cable |
| | no. of cores | | 2 |
| | diameter | | ≥ 0.5 mm² |
| Error (RUN) display of stations | | | LED |
| No. of occupied I/O points | | | 64 (definable by I/O assignment) |
| Applicable wire size | | mm² | ≥ 0.75 |
| External | voltage supply | | 21.6 – 27.6 V DC |
| | current supply (24 V DC) | mA | 90 |
| Internal power consumption (5 V DC) | | mA | 115 |
| Weight | | kg | 0.3 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 |

| Order information | Art. no. | 47192 |
|---|---|---|

| Accessories | I/O link modules AJ55TB □□□ (refer to the following page) |
|---|---|

## ■ MELSEC I/O Link Modules for A1SJ51T64




### Local I/Os in compact design

The local I/Os have little granularity. For example, mixed modules with 2 input points and 2 output points are available.
This system is perfect for updating existing machinery.

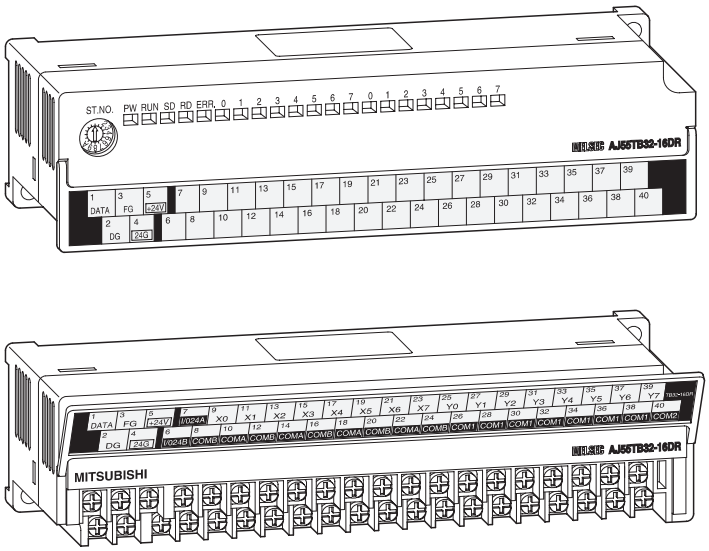
### Special features:

- Very compact design
- Three-conductor connection technology for input points
- Installation by screws or integrated DIN rail adapter
- Modules with 4, 8 and 16 input/output points
- Galvanic isolation between process and controller by photocoupler is a standard feature.
- Indication of the status of the input/output points by LEDs
- Adjustment of station numbers via rotaryswitch

| Specifications | | | AJ55TB3-4D | AJ55TB3-8D | AJ55TB3-16D | AJ55TB32-4DR | AJ55TB32-8DR | AJ55TB32-16DR |
|---|---|---|---|---|---|---|---|---|
| Controllable I/O points | | | 4 | 8 | 16 | 2 + 2 | 4 + 4 | 8 + 8 |
| Operating voltage range | | V DC | 19.2 – 26.4 | 19.2 – 26.4 | 19.2 – 26.4 | 21.6 – 26.4 | 21.6 – 26.4 | 21.6 – 26.4 |
| Rated input voltage | | | 24 V DC (7 mA) | 24 V DC (7 mA) | 24 V DC (7 mA) | 24 V DC (7 mA) | 24 V DC (7 mA) | 24 V DC (7 mA) |
| Rated output voltage | | | — | — | — | 24 V DC (2 A/point)<br>240 V AC (4 A/common) | 24 V DC (2 A/point)<br>240 V AC (4 A/common) | 24 V DC (2 A/point) ① |
| Switch ON | voltage | V | ≥ 14 | ≥ 14 | ≥ 14 | ≥ 14 | ≥ 14 | ≥ 14 |
| | current | mA | ≥ 3.5 | ≥ 3.5 | ≥ 3.5 | ≥ 3.5 | ≥ 3.5 | ≥ 3.5 |
| Switch OFF | voltage | V | ≤ 6 | ≤ 6 | ≤ 6 | ≤ 6 | ≤ 6 | ≤ 6 |
| | current | mA | ≤ 1.7 | ≤ 1.7 | ≤ 1.7 | ≤ 1.7 | ≤ 1.7 | ≤ 1.7 |
| Load resistance | | kΩ | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 |
| Min. switching load | | | — | — | — | 5 V DC (1 mA) | 5 V DC (1 mA) | 5 V DC (1 mA) |
| Max. switching voltage | | V | — | — | — | 250 V AC / 110 V DC | 250 V AC / 110 V DC | 49.9 V AC |
| Response time | OFF ⟶ ON | ms | ≤ 10 | ≤ 10 | ≤ 10 | In: ≤ 10 / Out: ≤ 10 | In: ≤ 10 / Out: ≤ 10 | In: ≤ 10 / Out: ≤ 10 |
| | ON ⟶ OFF | ms | ≤ 10 | ≤ 10 | ≤ 10 | In: ≤ 10 / Out: ≤ 12 | In: ≤ 10 / Out: ≤ 12 | In: ≤ 10 / Out: ≤ 12 |
| Life | mechanical | | — | — | — | 20 Mio. cycles | 20 Mio. cycles | 20 Mio. cycles |
| | electrical | | — | — | — | 100000 cycles | 100000 cycles | 100000 cycles |
| Max. switching frequency | | | — | — | — | 3600 cycles/h | 3600 cycles/h | 3600 cycles/h |
| Max. inputs ON simultaneously | | | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % |
| Input/output indicator | | | All modules provide a red LED for each input/output. | | | | | |
| Isolation method | | | All modules fitted with photocoupler isolation between input terminals and internal circuit. | | | | | |
| Communication cable | | | Shielded twisted pair 0.75 mm² x 1P / lead cable 0.75 mm² x 2C (for further information contact the Mitsubishi Electric service) | | | | | |
| I/O unit power supply | voltage | V DC | 15.6 – 27.6 | 15.6 – 27.6 | 15.6 – 27.6 | 15.6 – 27.6 | 15.6 – 27.6 | 15.6 – 27.6 |
| | current | mA | 35 | 45 | 60 | 40 | 50 | 70 |
| External voltage supply | | | — | — | — | 24 V DC / 240 V AC | 24 V DC / 240 V AC | 24 V DC |
| External power consumption (24 V DC) | | mA | — | — | — | 12 | 23 | 45 |
| Weight | | kg | 0.2 | 0.3 | 0.4 | 0.2 | 0.3 | 0.4 |
| Dimensions (W x H x D) | | mm | 82 x 45 x 66 | 114 x 45 x 66 | 177 x 45 x 66 | 82 x 45 x 66 | 114 x 45 x 66 | 177 x 45 x 66 |
| **Ordering information** | | Art. no. | 47191 | 47190 | 58548 | 47186 | 47185 | 58546 |
| **Accessories** | | | — | | | | | |

① In case of 240 V AC the unit does not comply to CE-standard.

## ■ MELSEC I/O Link Modules for A1SJ51T64




| Specifications | | | AJ55TB2-4R | AJ55TB2-8R | AJ55TB2-16R |
|---|---|---|---|---|---|
| Controllable I/O points | | | 4 | 8 | 16 |
| Operating voltage range | | V DC | — | — | — |
| Rated input voltage | | | — | — | — |
| Rated output voltage | | | 24 V DC (2 A/point)<br>240 V AC (8 A/common) | 24 V DC (2 A/point)<br>240 V AC (8 A/common) | 24 V DC (2 A/point, 8 A/common) ① |
| Switch ON | voltage | V | — | — | — |
| | current | mA | — | — | — |
| Switch OFF | voltage | V | — | — | — |
| | current | mA | — | — | — |
| Load resistance | | kΩ | — | — | — |
| Min. switching load | | | 5 V DC (1 mA) | 5 V DC (1 mA) | 5 V DC (1 mA) |
| Max. switching voltage | | | 250 V AC / 110 V DC | 250 V AC / 110 V DC | 49.9 V AC |
| Response time | OFF ⟶ ON | ms | ≤ 10 | ≤ 10 | ≤ 10 |
| | ON ⟶ OFF | ms | ≤ 12 | ≤ 12 | ≤ 12 |
| Life | mechanical | | 20 Mio. cycles | 20 Mio. cycles | 20 Mio. cycles |
| | electrical | | 100000 cycles | 100000 cycles | 100000 cycles |
| Max. switching frequency | | | 3600 cycles/h | 3600 cycles/h | 3600 cycles/h |
| Max. inputs ON simultaneously | | | — | — | — |
| Input/output indicator | | | All modules provide a red LED for each input/output. | | |
| Isolation method | | | All modules fitted with photocoupler isolation between input terminals and internal circuit. | | |
| Communication cable | | | Shielded twisted pair 0.75 mm² x 1P / lead cable 0.75 mm² x 2C<br>(for further information contact the Mitsubishi Electric service) | | |
| I/O unit power supply | voltage | | 15.6 – 27.6 V DC | 15.6 – 27.6 V DC | 15.6 – 27.6 V DC |
| | current | mA | 50 | 65 | 85 |
| External voltage supply | | | 24 V DC / 240 V AC | 24 V DC / 240 V AC | 24 V DC |
| External power consumption (24 V DC) | | mA | 23 | 45 | 90 |
| Weight | | kg | 0.2 | 0.3 | 0.4 |
| Dimensions (W x H x D) | | mm | 82 x 45 x 66 | 114 x 45 x 66 | 177 x 45 x 66 |
| **Ordering information** | | Art. no. | 47189 | 47187 | 58549 |
| **Accessories** | | | — | | |

① In case of 240 V AC the unit does not comply to CE-standard.

# The PROFIBUS/DP Network

## Data Communications

The open PROFIBUS/DP network enables extremely fast data exchange with a very wide variety of slave devices, including:

- Remote digital I/Os
- Remote analog I/Os
- Remote intelligence PLC (FX0N, FX2N)
- Frequency inverters (FR-A 240, FR-A 540 (L), FR-E 500)
- Operator terminals (MAC E series)
- A range of other devices from third-party manufacturers

## Structure

The maximum coverage of a bus segment is 1200 m (at a maximum of 93.75 kbit/s). Up to 3 repeaters are allowed. Thus the maximum distance between 2 stations is calculated with 4800 m.

## Cable types

To help reduce costs PROFIBUS/DP uses RS 485 technology with simple twisted-pair cabling.

Suitable cables include the UNITRONIC BUSLD from Lappkabel and the DUE 4451 from Alcatel.

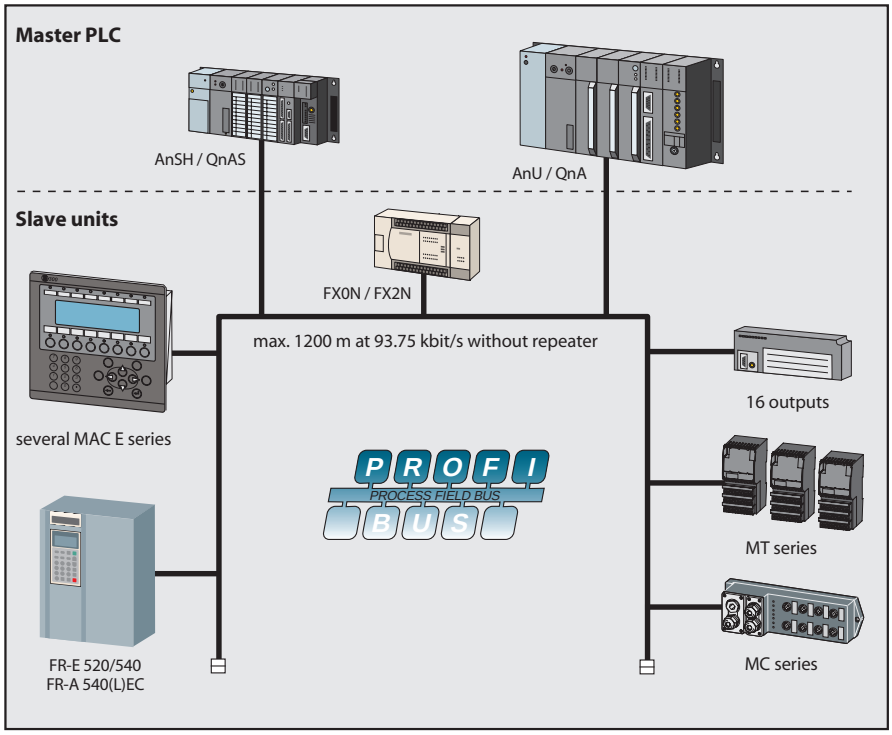
## Data exchange

The PROFIBUS AJ71PB92D and A1SJ71PB92D master modules support slave device data exchange with up to 244 send bytes and 244 receive bytes. This means you can exchange a total of up to 128 bytes with a slave unit per network cycle.

## Administration

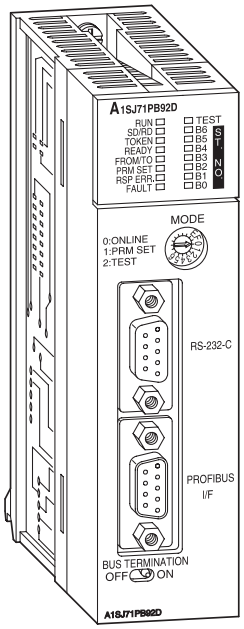
In combination with the MELSEC ProfiMap configuration software the AJ71PB92D PROFIBUS/DP master unit gives you user-friendly plug-and-play technology. The configuration software is self-explanatory, using a graphical model for setting up the network. You simply select the slave unit (e.g. FX2N), assign the station numbers and specify where the information is stored in the master CPU.

Of course, PROFIBUS/DP slaves from MITSUBISHI ELECTRIC can also be connected to master devices from other manufacturers.




| Specifications | | | Master AJ71PB92 | Master A1SJ71PB92D |
|---|---|---|---|---|
| Communications protocol | | | EN 50170 / DIN 19245-T3 | |
| Cabling | | | Shielded twisted-pair with 24 AWG = 0.22 mm², impedance: 100 – 130 Ω;<br>Shielded twisted-pair with 22 AWG = 0.34 mm², impedance: 135 – 165 Ω; | |
| Interface | | | RS485 | |
| Data transfer rate | distance | | | |
| | 1 200 m | kbit/s | 9.6 / 19.2 / 93.75 | |
| | 1 000 m | kbit/s | 187.5 | |
| | 400 m | kbit/s | 500 | |
| | 200 m | kbit/s | 1 500 | 12000 / 6000 / 3000 (100 m)<br>1500 (200 m) |
| Max total distance | | m | 4800 (3 repeaters) | |
| Slave units per master | | | 60 | |
| Stations per segment | | | 32 | |
| Repeaters per network | | | 3 | |
| **Accessories** | | | ProfiConT: PROFIBUS 9-pin D-SUB plug connector for up to 12 Mbaud, art. no. 87035 (refer to page 82) | |

## ■ PROFIBUS DP/FMS Module




### The open standard for MELSEC PLCs

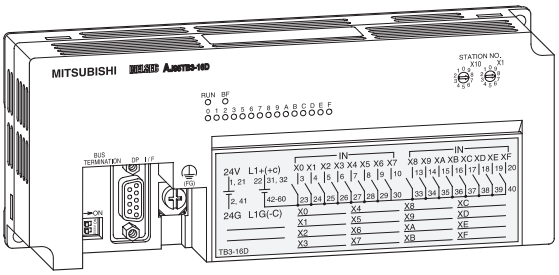
The A1SJ71PB96F PROFIBUS/FMS module and the A1SJ71PB92D PROFIBUS/DP module enable MELSEC programmable logic controllers to communicate with other PROFIBUS devices.

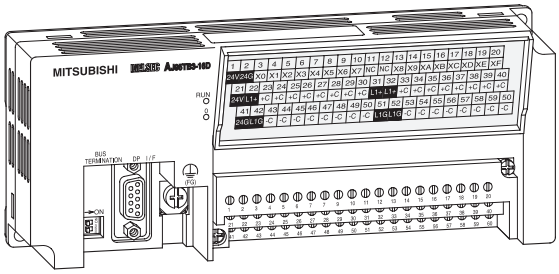
### Special features:

- The A1SJ71PB92D PROFIBUS/DP master can communicate with up to 60 slave units. Up to 32 input bytes and 32 output bytes can be processed at a time per slave station. Supported functions include Sync, Freeze and specialised diagnostics messages for the specific slave types used.
- The A1SJ71PB96F PROFIBUS/FMS master supports up to 32 links and supports simple variables, records and arrays.

| Specifications | | | A1SJ71PB96F | A1SJ71PB92D |
|---|---|---|---|---|
| Module type | | | Master | Master |
| Protocol | | | EN50170, DIN19245T1+2 | EN50170, DIN19245T3 |
| Interface | | type | RS485 | RS485 |
| Communications mode | | | Logical token ring with subordinate Master/Slave procedure | Logical token ring with subordinate Master/Slave procedure |
| Topology | | | Bus | Bus |
| Modulation | | | NRZ | NRZ |
| Cabling | | | Shielded twisted-pair | Shielded twisted-pair |
| Communications distance | 9.6 kbps<br>19.2 kbps<br>93.75 kbps | m | 1200 | 1200, 4800 (3 repeaters) |
| | 187 kbps | m | 600 | 1000, 4000 (3 repeaters) |
| | 500 kbps | m | 200 | 400, 1600 (3 repeaters) |
| | 1500 kbps | m | 100 | 200, 800 (3 repeaters) |
| | 3 Mbps<br>6 Mbps<br>12 Mbps | m | — | 100, 400 (3 repeaters) |
| Max. nodes | | | 32, 62 (1 repeater), 92 (2 repeaters), 122 (3 repeaters) | 32, 62 (1 repeater), 92 (2 repeaters), 126 (3 repeaters) |
| Repeaters per network | | | Max. 3 | Max. 3 |
| I/O points | | | 32 | 32 |
| Internal power consumption (5 V DC) | | mA | 560 | 560 |
| Weight | | kg | 0.27 | 0.27 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |
| **Order information** | | Art. no. | 46421 | 63393 |
| **Accessories** | | | Configuration software incl. configuration cable for A1SJ71PB92D, A1SJ71PB96F: MELSEC ProfiMap, art. no.: 102996<br>PROFIBUS plug connector for up to 12 Mbaud: ProfiConT, art. no 87035 (refer to page 82) | |

## ■ PROFIBUS/DP Compact I/O Modules




### Compact I/O modules for PROFIBUS/DP

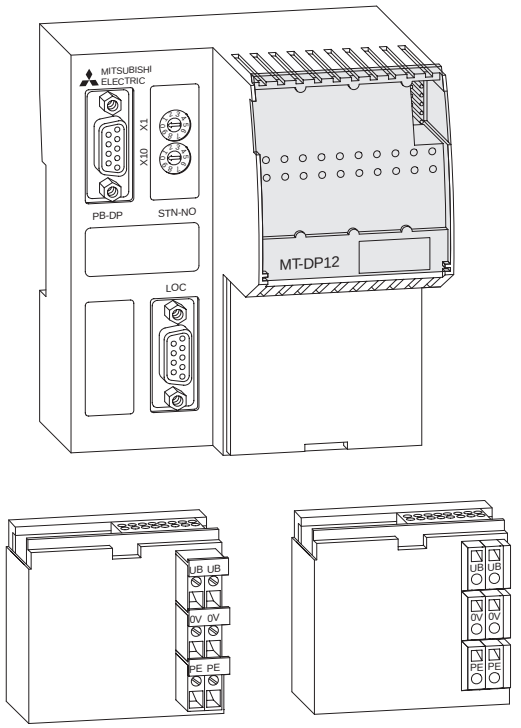
These PROFIBUS/DP I/O modules enable signal registration at the machine with relatively short cables. The reduced cabling requirements and the ability to activate individual machine components automatically are among the great advantages of these modules.

### Special features:

- I/Os and PROFIBUS/DP cable electrically isolated from the internal circuitry
- Outputs protected with melt fuse
- Support for data transfer rates from 9 600 baud to 12 Mbaud
- 3-pole sensor connection technology
- Removable terminal block with screw terminals
- Integrated switchable terminating resistors
- Rotary switch station number allocation
- Both DIN rail and screw mounting supported

| Specifications | | | AJ95TB3-16D | AJ95TB2-16T | AJ95TB32-16DT |
|---|---|---|---|---|---|
| Controllable I/O points | | | 16 Input points | 16 Transistor outputs | 8 Input points / 8 transistor outputs |
| I/Os in groups with | | | 16 | 8 | 8 |
| Occupied stations | | | 1 | 1 | 1 |
| **Input data** | | | | | |
| Operating voltage range | | V DC | 19.2 – 26.4 | — | 19.6 – 26.4 |
| Rated input voltage | | | 24 V DC (7 mA) | — | 24 V DC (7 mA) |
| Switch ON | voltage | V | ≥ 14 | — | ≥ 14 |
| | current | mA | ≥ 3.5 | — | ≥ 3.5 |
| Switch OFF | voltage | V | ≤ 6 | — | ≤ 6 |
| | current | mA | ≤ 1.7 | — | ≤ 1.7 |
| Input resistance | | kΩ | 3.3 | — | 3.3 |
| Input type | | | Sink/souce | Source output | Sink/source input, source output |
| **Output data** | | | | | |
| Output voltage | | | — | 12/24 V DC (0.8 A/channel) (3.2 A/total) | — |
| Max. output load | | | | 0.8 A / output | 0.8 A / output |
| Response time | OFF ⟶ ON | ms | ≤ 10 (input) | ≤ 2 (output) | ≤ 10 (input), ≤ 2 (output) |
| | ON ⟶ OFF | ms | ≤ 10 (input) | ≤ 2 (output) | ≤ 10 (input), ≤ 2 (output) |
| External voltage supply | | | — | 10.8 – 26.4 V DC | 10.8 – 26.4 V DC |
| External power consumption (24 V DC) | | mA | — | 35, all I/Os ON, no load | 18, all I/Os ON, no load |
| Withstand strength | | V AC | 500 | 500 | 500 |
| Isolation resistance | | | ≥ 10 MΩ | ≥ 10 MΩ | ≥ 10 MΩ |
| **Common data** | | | | | |
| Isolation | | | All modules fitted with photocoupler isolation between I/Os. | | |
| Power consumption | voltage | V DC | 15.6 – 31.2 | 15.6 – 31.2 | 15.6 – 31.2 |
| | current | mA | 174 (24 V DC) | 188 (24 V DC) | 183 (24 V DC) |
| Applicable wire size | | $mm^2$ | 0.18 – 2 | 0.18 – 2 | 0.18 – 2 |
| Weight | | kg | 0.45 | 0.45 | 0.45 |
| Dimensions (W x H x D) | | mm | 197.4 x 80 x 46.5 | 197.4 x 80 x 46.5 | 197.4 x 80 x 46.5 |
| **Order information** | | Art. no. | 63079 | 63080 | 63081 |
| **Accessories** | | | PROFIBUS plug connector for up to 12 Mbaud: ProfiConT; art. no 87035 (refer to page 82) | | |

## ■ PROFIBUS/DP MT Modules




### Basic module (head station) of the MT series

The basic module connects the extension modules of the MT series (MT = Modular Type) to the PROFIBUS/DP. The MT devices are mounted to a DIN rail. Due to the additional second interface on the basic module the extension modules can be installed in two rows.

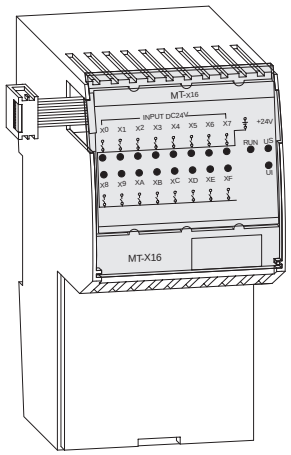
The modules on the separate DIN rail are supplied with data and the system voltage via an extension cable and the local system extension module.

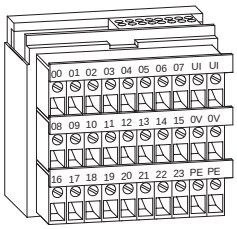
### Special features:

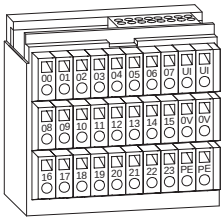
- Up to 16 digital and 8 analog extension modules can be connected.
- Automatic detection of the data transfer rate
- Optocouplers between interface and system
- Two selectable types of connecting terminals: screw type and cache clamp terminals
- Supported installation in two rows through the local extension MT-LE-SET to be connected to the basic module.
- Up to 256 digital inputs/outputs per basic module

| Specifications | | | MT-DP12 | MT-DP12E |
|---|---|---|---|---|
| Module type | | | Basic module of the MT series, PROFIBUS/DP slave | Basic module of the MT series, PROFIBUS/DP slave |
| Commu-nications | protocol | | DIN 19245-T3 | EN50170, DIN 19245-T3 |
| | medium | | Shielded twisted-pair with 24AWG = 0.22 mm², impedance: 100 – 130 Ω; Shielded twisted-pair with 22AWG = 0.34 mm², impedance: 135 – 165 Ω | Shielded twisted-pair with 24AWG = 0.22 mm², impedance: 100 – 130 Ω; Shielded twisted-pair with 22AWG = 0.34 mm², impedance: 135 – 165 Ω |
| Interface | | | RS485 | RS485 |
| Operation modes | | | Sync mode and freeze mode are supported | Sync mode and freeze mode are supported |
| Communications rate | | | 9.6; 19.2; 93.75; 187.5; 500 kBit/S, 1.5; 3; 6; 12 Mbit/s | 9.6; 19.2; 93.75; 187.5; 500 kBit/S, 1.5; 3; 6; 12 Mbit/s |
| Max. total distance | | m | 4800 (3 repeater) | 4800 (3 repeater) |
| No. of connectable extension modules | | | Max. 16 extension modules (digital and analog I/O modules) | Max. 4 extension modules (digital and analog I/O modules) |
| Adressable digital I/Os | | | 256 | 72 |
| I/O points | | | — | — |
| **Integrated inputs** | | | | |
| Digital inputs | | | — | 8 |
| Isolation | | | — | Optocoupler isolation between input terminals and internal power. |
| Rated input current | | | — | 24 V DC (18 – 30 V) |
| Response time | OFF ⟶ ON | ms | — | 1 |
| | ON ⟶ OFF | ms | — | 1 |
| Short circuit protection | | | — | Electronic |
| Status display for inputs | | | — | The module posseses of status LEDs for all inputs. |
| **Common data** | | | | |
| Applicable wire size | | mm² | 0.75 – 2.5 | 0.75 – 2.5 |
| Power supply | | V DC | 24 | 24 |
| Internal power consumption (24 V DC) | | A | Max. 0.5 (with maximum configuration) | Max. 0.5 (with maximum configuration) |
| Weight | | kg | 0.28 | 0.35 |
| Dimensions (W x H X D) | | mm | 96 x 114 x 60 | 96 x 114 x 60 |
| **Order information** | | Art.-Nr. | 68887 | 124622 |
| **Accessories** | | | Local system adapter MT-LE with extension cable MT-LE-CBL50 (length 0,5 m) = MT-LE-SET, art. no. 69759<br>Screw type terminal block MT-DP12-TBS, art. no. 68888<br>Cache clamp terminal block MT-DP12-TBC, art. no. 68889<br>PROFIBUS connector for up to 12 Mbaud: ProfiConT, art. no. 87035<br>(see page 82) | Screw type terminal block MT-DP12E-TBS, art. no.: 124624<br>Cache clamp terminal block MT-DP12E-TBC, art. no.: 124623<br>ROFIBUS connector for up to 12 Mbaud: ProfiConT, art. no. 87035<br>(see page 82) |

## ■ PROFIBUS/DP MT Modules



### Digital input/mixed modules

The digital input modules of the MT series facilitate the evaluation of process data (contacts, limit switches, etc.) via a PROFIBUS/DP master. Modules with 4, 8 and 16 inputs are supplied.

Beside the 4 inputs the mixed module MT-X4Y4T consists of 4 transistor outputs.

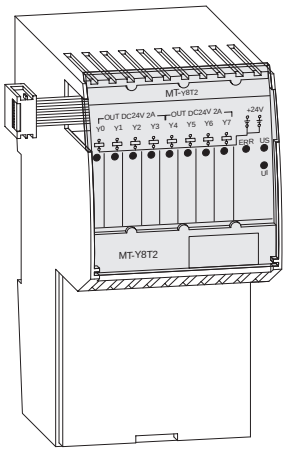
### Special features:

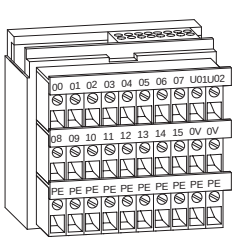
- For the 16-type modules potential terminal blocks in three-wire technique are available.
- The driving power supplying the sensors and actors (except relay output) is directly fed into the module.
- Connection of the sensory circuits in three-wire technique
- Standard potential isolation between process and module
- Two selectable types of connecting terminals: screw type and cache clamp terminals

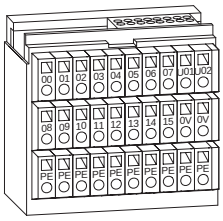
| Specifications | | | MT-X8 | MT-X16 | MT-X4Y4T |
|---|---|---|---|---|---|
| Inputs | | | 8 | 16 | 4 |
| Simultaneously ON inputs | | | 70 % | 70 % | 100 % |
| Outputs | | | — | — | 4 |
| Output type | | | — | — | Transistor |
| Common terminal arrangement | | | — | — | 4 |
| Isolation | | | Optocoupler isolation between input terminals and internal power for all modules. | | |
| Input voltage (sensor supply) | | | 24 V DC (±25 %) | 24 V DC (±25 %) | 24 V DC (±25 %) |
| Output voltage range | | | — | — | 24 V DC (-1 %) |
| Output voltage (actor supply) | | | — | — | 24 V DC (±25 %) |
| Max. switching voltage | | | — | — | — |
| Rated input current | | A | 0.7 | 0.7 | 0.7 |
| Max. current | per output | A | — | — | 0.5 |
| | per group | A | — | — | 4 |
| Inrush current | | | — | — | — |
| Leakage current at OFF | | | — | — | < 50 µA |
| Response time | OFF ⟶ ON | ms | ≤ 1 | ≤ 1 | ≤ 14 |
| | ON ⟶ OFF | ms | ≤ 1 | ≤ 1 | ≤ 0.05 |
| Short circuit protection | | | Electronic | Electronic | Electronic |
| Status display for inputs | | | All modules have one or two status LEDs per input. | | |
| Error indicator | | | LED | LED | LED |
| I/O points | | | 8 | 16 | 8 |
| Connection terminal | | | All modules can be fitted with screw type or cache clamp terminal blocks (see accessories). | | |
| Applicable wire size | | $mm^2$ | 0.75 – 2.5 | 0.75 – 2.5 | 0.75 – 2.5 |
| External sensor/actor supply | | | 24 V DC (≤30 mA) | 24 V DC (≤30 mA) | 24 V DC (≤20 mA) |
| Internal power consumption (8 V DC) | | mA | 25 | 30 | 35 |
| Weight (without terminal block) | | kg | 0.16 | 0.17 | 0.22 |
| Dimensions (W x H x D) | | mm | 56 x 114 x 60 | 56 x 114 x 60 | 56 x 114 x 60 |
| **Order information** | | Art. no. | 68893 | 68896 | 124625 |
| **Accessories*** | | Terminal blocks | MT-X8-TBS, no. 68894<br>MT-X8-TBC, no. 68895 | MT-X16-TBS, no. 68897<br>MT-X16-TBC, no. 68898<br>MT-X16-PTBS, no. 69400<br>MT-X16-PTBC, no. 69397 | MT-X4Y4T-TBS, no. 124626<br>MT-X4Y4T-TBC, no. 124627 |

* Description of the terminal blocks: TBS=screw type terminal block, TBC=cache clamp terminal block, PTBS=screw type terminals with potential terminal, PTBC=cache clamp terminals with potential terminal

## ■ PROFIBUS/DP MT Modules



### Digital output modules

The digital output modules of the MT series facilitate the evaluation of process data (contacts, limit switches, etc.) via a PROFIBUS/DP master. Modules with 4, 8 and 16 inputs are supplied.

The digital output modules supply different function elements for the customisation to the required control functions.

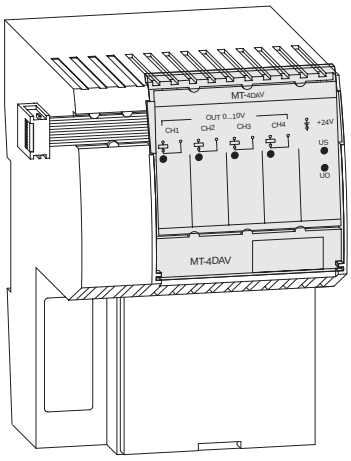
### Special features:

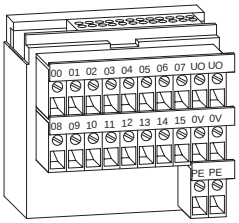
- For the 16-type modules potential terminal blocks in three-wire technique are available.
- The output modules provide transistor outputs rated at 0.5 A and 2 A, and relay outputs with up to 3 A (AC).
- The driving power supplying the sensors and actors (except relay output) is directly fed into the module.
- Connection of the sensory circuits in three-wire technique
- Standard potential isolation between process and module
- Two selectable types of connecting terminals: screw type and cache clamp terminals

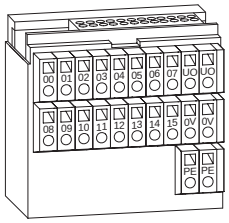
| Specifications | | | MT-Y8T | MT-Y16T | MT-Y8T2 | MT-Y4R | MT-Y8R5 |
|---|---|---|---|---|---|---|---|
| Outputs | | | 8 | 16 | 8 | 4 | 8 |
| Output type | | | Transistor | Transistor | Transistor | Relay | Relay |
| Common terminal arrangement | | | 8 | 8 | 4 | 1 | 1 |
| Isolation | | | Optocoupler isolation between input and output terminals and internal power for all modules. | | | | |
| Output voltage range | | | 24 V DC (-1 %) | 24 V DC (-1 %) | 24 V DC (-0.5 %) | 24 / 110 / 230 V DC, AC | 24 / 110 / 230 V DC, AC |
| Output voltage (actor supply) | | | 24 V DC (±25 %) | 24 V DC (±25 %) | 24 V DC (±25 %) | | |
| Max. switching voltage | | | — | — | — | 250 V AC | 250 V AC |
| Switching capacity conf. EN60947/5/1 | | at 24 V | — | — | — | 2 A (AC15) / 1.3 A (DC 13) | 5 A (AC12) / 3 A (AC15) / 1.0 A (DC 13) |
| | | at 110 V | — | — | — | 2 A (AC15) / 0.25 A (DC 13) | 5 A (AC12) / 3 A (AC15) / 0.2 A (DC 13) |
| | | at 220 V | — | — | — | 2 A (AC15) / 0.1 A (DC 13) | 5 A (AC12) / 3 A (AC15) / 0.1 A (DC 13) |
| Max. current | per output | A | 0,5 | 0,5 | 2 | — | — |
| | per group | A | 4 | 4 | 4 | — | — |
| Leakage current at OFF | | | <50 µA | <50 µA | 6 µA | — | — |
| Response time | OFF → ON | ms | ≤ 0.14 | ≤ 0.14 | ≤ 0.3 | 10 ms | 10 ms |
| | ON → OFF | ms | ≤ 0.05 | ≤ 0.05 | ≤ 0.08 | 5 ms | 5 ms |
| Short circuit protection | | | Electronic | Electronic | Electronic | — | — |
| Status display for outputs | | | All modules have one or two status LEDs per output. | | | | |
| Error indicator | | | LED | LED | — | — | — |
| I/O points | | | 8 | 16 | 8 | 8 | 8 |
| Connection terminal | | | All modules can be fitted with screw type or cache clamp terminal blocks (see accessories). | | | | |
| Applicable wire size | | mm² | 0.75 – 2.5 | 0.75 – 2.5 | 0.75 – 2.5 | 0.75 – 2.5 | 0.75 – 2.5 |
| External sensor/actor supply | | | 24 V DC (≤20 mA) | 24 V DC (≤20 mA) | 24 V DC (≤20 mA) | 24 V DC (≤20 mA) | 24 V DC (≤20 mA) |
| Internal power consumption (8 V DC) | | mA | 35 | 60 | 35 | Max. 45 | Max. 120 |
| Weight (without terminal block) | | kg | 0.16 | 0.16 | 0.18 | 0.175 | 0.325 |
| Dimensions (W x H x D) | | mm | 56 x 114 x 60 | 56 x 114 x 60 | 56 x 114 x 60 | 56 x 114 x 60 | 112 x 114 x 60 |
| **Order information** | | Art. no. | 68899 | 68902 | 68905 | 68908 | 124628 |
| **Accessories*** | | Terminal blocks | MT-Y8T-TBS, no. 68900<br>MT-Y8T-TBC, no. 68901 | MT-Y16T-TBS, no. 68903<br>MT-Y16T-TBC, no. 68904<br>MT-Y16T-PTBS, no. 69399<br>MT-Y16T-PTBC, no. 69398 | MT-Y8T2-TBS, no. 68906<br>MT-Y8T2-TBC, no. 68907 | MT-Y4R-TBS, no 69401<br>MT-Y4R-TBC, no. 69402 | MT-Y8R5-TBSLR, no. 125534<br>MT-Y8R5-TBCLR, no. 125533 |

* Description of the terminal blocks: TBS=screw type terminal block, TBC=cache clamp terminal block, PTBS=screw type terminals with potential terminal, PTBC=cache clamp terminals with potential terminal

## ■ PROFIBUS/DP MT Modules



### Analog input/output modules

Analog input modules of the MT series convert analog process data like pressure, temperature, etc. into digital values that are sent to the PROFIBUS/DP master.

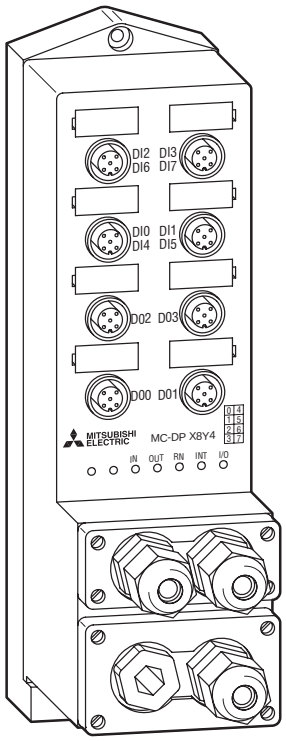
The analog output modules convert the digital values sent from the PROFIBUS/DP master into an analog voltage signal. This signal can be used to control valves, inverters, servomotors, etc.

### Special features:

- 4 separately parameterisable channels per module
- Voltage, current, and temperature evaluation (MT-4AD) can be set via parameter.
- The driving power supplying the sensors and actors is directly fed into the module.
- With the analog input module current, voltage, and 4-wire PT100 inputs can be operated in parallel
- Two selectable types of connecting terminals: screw type and cache clamp terminals
- Standard potential isolation between process and module

| Specifications | | | MT-4AD | | MT-4DA | | MT-4DAV | |
|---|---|---|---|---|---|---|---|---|
| Module type | | | Analog input module | | Analog output module | | Analog output module | |
| No. of channels | | | 4 | | 4 | | 4 | |
| Analog input | | | -10 V – +10 V, -20 mA – +20 mA, 4 – 20 mA, -180 – +600 °C (PT100) | | — | | — | |
| Resolution of digital output | | | 16 bits binary (incl. sign) | | — | | — | |
| Resolution of digital input | | | — | | 16 bits binary (incl. sign) | | 16 bits binary (incl. sign) | |
| Analog output | | | — | | -10 – +10 V, 0 – +20 mA | | 0 – 10 V DC | |
| Input resistance | voltage | kΩ | 176 | | — | | — | |
| | current | Ω | 50 | | — | | — | |
| Max. input | voltage | V | ±15 | | — | | — | |
| | current | mA | ±30 | | — | | — | |
| Max. output load | | | — | | ≥750 Ω | | ≥750 Ω | |
| I/O characteristics | | | **Analog input**<br>-10 – +10 V<br>-20 – +20 mA<br>4 – 20 mA<br>-180 – +600 °C | **Digital output**<br>-4000 – +4000<br>-4000 – +4000<br>0 – +4000<br>-1800 – +6000 | **Digital input**<br>- 2000 – +2000<br>0 – 2000 | **Analog output**<br>-10 – +10 V<br>0 – +20 mA | **Digital input**<br>0 – 4000 | **Analog output**<br>0 – 10 V |
| Max. resolution | | | 2.5 mV<br>5 µA<br>4 µA<br>0.125 °C | | 5 µV<br>10 µA | | — | 2.5 mV |
| Overall accuracy in % of the measurement range | | | ±50 mV (-10 – +10 V)<br>±80 µA (-20 – +20 mA)<br>±76 µA (4 – 20 mA)<br>±4.2 °C (-180 – +600 °C) | | — | | — | ±30 mV (0 – +10 V) |
| Max. conversion time | | | 50 ms/channel | | 1 ms/4 channels | | 1 ms/channel | |
| Isolation | | | Optocoupler isolation between input terminals and internal power | | | | | |
| Connection terminal | | | All modules can be fitted with screw type or cache clamp terminal blocks (see accessories). | | | | | |
| External sensor/actor supply | | | 24 V DC (≤50 mA) | | 24 V DC (≤50 mA) | | 24 V DC (≤120 mA) | |
| Applicable wire size | | $mm^2$ | 0.75 – 1,5 | | 0.75 – 1,5 | | 0.75 – 1,5 | |
| Internal power consumption (8 V DC) | | mA | 80 | | | | 60 | |
| Weight | | kg | 0.225 | | 0.225 | | 0.22 | |
| Dimensions (W x H X D) | | mm | 76 x 114 x 60 | | 56 x 114 x 60 | | 76 x 114 x 60 | |
| **Order information** | | Art. no. | 68909 | | 124643 | | 68912 | |
| **Accessories** | | Terminal blocks | Screw type terminal block MT-4AD-TBS, no. 68910<br>Cache clamp terminal block MT-4AD-TBC, no. 68911 | | Screw type terminal block MT-4DA-TBS, no. 124645<br>Cache clamp terminal block MT-4DA-TBC, no. 124644 | | Screw type terminal block MT-4DAV-TBS, no. 68913<br>Cache clamp terminal block MT-4DAV-TBC, no. 68914 | |

## ■ PROFIBUS/DP MC Modules




### Digital input, output, and combined modules acc. to IP67

The digital I/O modules of the MC series support the evaluation of process signals (contacts, limit switches, etc.) directly on the machine via a PROFIBUS/DP master. The sensors and actuators are connected via plug-type/screw terminals.

Different modules with 16 inputs max. and 8 outputs max. as well as a combined I/O module with 8 inputs and 4 outputs are available.

### Special features:

- The driving power for the sensors and actuators is supplied directly on the module.
- Connection of the sensory circuits in 3-wire cabling.
- Standard electrical isolation between process and control via optocoupler.
- Overload and short-circuit protection.

| Specifications | | | MC-DPX8 | MC-DPX16 | MC-DPY8 | MC-DPX8Y4 |
|---|---|---|---|---|---|---|
| Inputs | | | 8 | 16 | — | 8 |
| Outputs | | | — | — | 8 | 4 |
| Output type | | | — | — | Transistor | Transistor |
| Isolation | | | Optocoupler isolation between input terminals and internal power | | | |
| Input voltage (sensor supply) | | | 24 V DC (±25 %) | 24 V DC (±25 %) | 24 V DC (±25 %) | 24 V DC (±25 %) |
| Rated output voltage | | | — | — | 24 V DC (-1 %) | 24 V DC (-1 %) |
| Output voltage (actor supply) | | | — | — | 24 V DC (±25 %) | 24 V DC (±25 %) |
| Max. switching voltage | | A | — | — | 2 | 2 |
| Max. input current | | A | < 0.1 | <0.1 | — | <0.1 |
| Max. current | per output | A | — | — | 2 | 2 |
| | per group | A | — | — | 10 at 0–55 °C, 16 at 0–40 °C | 10 bei 0–55 °C, 16 bei 0–40 °C |
| Leakage current at OFF | | | — | — | <10 µA | <10 µA |
| Response time | OFF ⟶ ON | ms | 1 | 1 | 0.5 | 0.5 |
| | ON ⟶ OFF | ms | 1 | 1 | 0.5 | 0.5 |
| Short circuit protection | | | Electronic | Electronic | Electronic | Elektronisch |
| Status display for outputs | | | All modules have one status LEDs per output. | | | |
| Error indicator | | | LED | LED | LED | |
| I/O points | | | 8 | 16 | 8 | 16 |
| Connection terminal | | | All modules can be fitted with screw type or cache clamp terminal blocks. | | | |
| Applicable wire size | | $mm^2$ | 0.75 – 2.5 | 0.75 – 2.5 | 0.75 – 2.5 | |
| External sensor/actor supply | | | 24 V DC (≤100 mA) | 24 V DC (≤100 mA) | 24 V DC (≤100 mA) | 24 V DC (≤100 mA) |
| Internal power consumption (8 V DC) | | mA | 80 | 80 | 80 | 80 |
| Weight (without termninal block) | | kg | 0.47 | 0.47 | 0.47 | 0.47 |
| Dimensions (W x H x D) | | mm | 62 x 217.5 x 70.5 | 62 x 217.5 x 70.5 | 62 x 217.5 x 70.5 | 62 x 217.5 x 70.5 |
| **Order information** | | Art.-Nr. | 127208 | 127211 | 127209 | 127210 |

# DeviceNet Network

## Data Communications

The DeviceNet represents a cost-effective solution for the network integration of low-level terminal equipment.
Up to 64 devices including a master can be integrated in one network.

## Structure

Due to the supported tree structure of the data line, a T-junction can be installed in any place. It has to be considered that the overall extension must not exceed 500 m.

Using repeaters increases the overall extension to 3 km.

## Cable types

For the data exchange a cable with two shielded twisted-pair cables is used.

## Parameterization

Parameterization is done with the configuration software SyCon from Ver. 2.0.6.2 by the Hilscher company.

## Communications

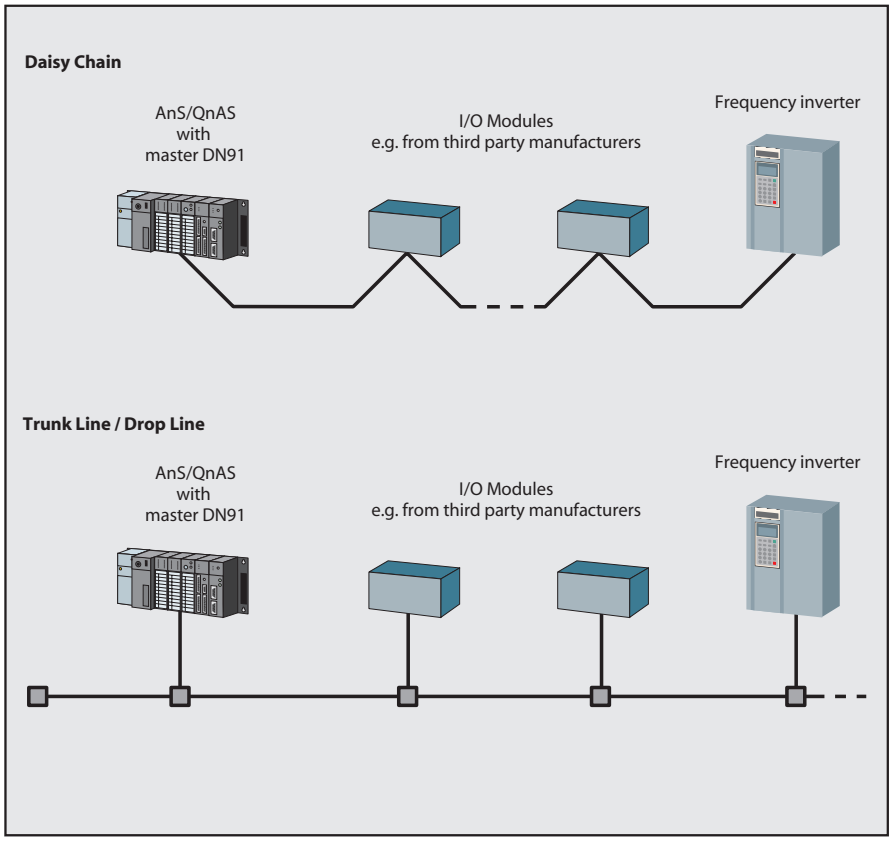
The bus accessing method CSMA/NDA ensures an extremely fast and efficient access of the link devices to the bus.

Based on the Producer/Consumer network model this method ensures greater determinism of all data.

The slave modules communicate via the following methods:

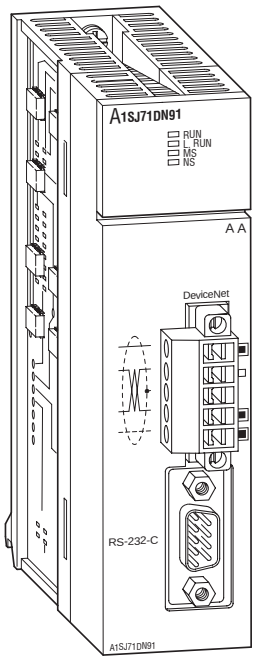
- Polling
- Bit strobe
- Change of state
- Cyclic

Information at a size of 8 bytes per data packet can be transmitted. Packets exceeding these 8 bytes are fragmented automatically.




| Cabel | | Thick Cable | Thin Cable |
|---|---|---|---|
| Outline diameter | mm | 12.2 | 6.9 |
| Inside wire for data (blue / white) | | 18AWG19x30 zinc plated | 24AWG19x36 zinc plated |
| Inside wire for power supply (red / black) | | 15AWG19x28 zinc plated | 22AWG19x34 zinc plated |
| Trunkline | | Yes | Yes |
| Dropline | | Yes | Yes |
| Max. distance | m | 500 | 500 |
| Max. distance incl. Repeater | m | 3000 | 3000 |

## DeviceNet Master Module




### CAN based network for low level terminals

The DeviceNet represents a cost-effective solution for the network integration of low-level terminal equipment. Up to 64 devices including a master can be integrated in one network.

### Special features:

- Up to 64 devices including a master station can be configured within one network.
- The positions of master and slave stations are user-selectable.
- Transfer rates of 125, 250 and 500 kBaud.
- Distances of up to 500 m.
- Communication methods
  - Polling
  - Bit strobe
  - Change of state
  - Cyclic

| Specifications | | | A1SJ71DN91 |
|---|---|---|---|
| Module type | | | Master |
| Applicable PLC series | | | MELSEC AnS/QnAS series |
| Nodes per network | | | Group 2 Client |
| Stations per network | | | 0 up to 63 |
| Max. number of slave stations | | | 63 |
| Communi-cations volume | I/O communication | | 2048 adresses (256 bytes) |
| | Message communication | | 240 bytes |
| Communica-tion speed | Cabel length | 500 m | 125 kBaud |
| | | 250 m | 250 kBaud |
| | | 100 m | 500 kBaud |
| Network power consumption | | mA | 26.5 |
| I/O points | | | 32 |
| Internal power consumption (5 V DC) | | mA | 240 |
| Weight | | kg | 0.23 |
| Dimensions (W x H x D) | | mm | 130 x 34.5 x 93.6 |

| Order information | Art.-No. | 124373 |
|---|---|---|

| Accessories | Configuration software SyCon from Fa. Hilscher |
|---|---|

# The Network with Actuator Sensor Interface

## Data transfer

The AS interface is an international standard for the lowest field bus level.

The network suits versatile demands, is very flexible and particularly easy to install.

Controlled are

- Sensors
- Actors
- I/O units
- Gateways

## Structure

ASI networks can be configured in any random tree structure.

Up to 2 repeaters are supported providing a maximum communication distance of 300 m. Terminating resistors are not needed.

## Cable types

A special coded 2-wire cable or a round cable is required.

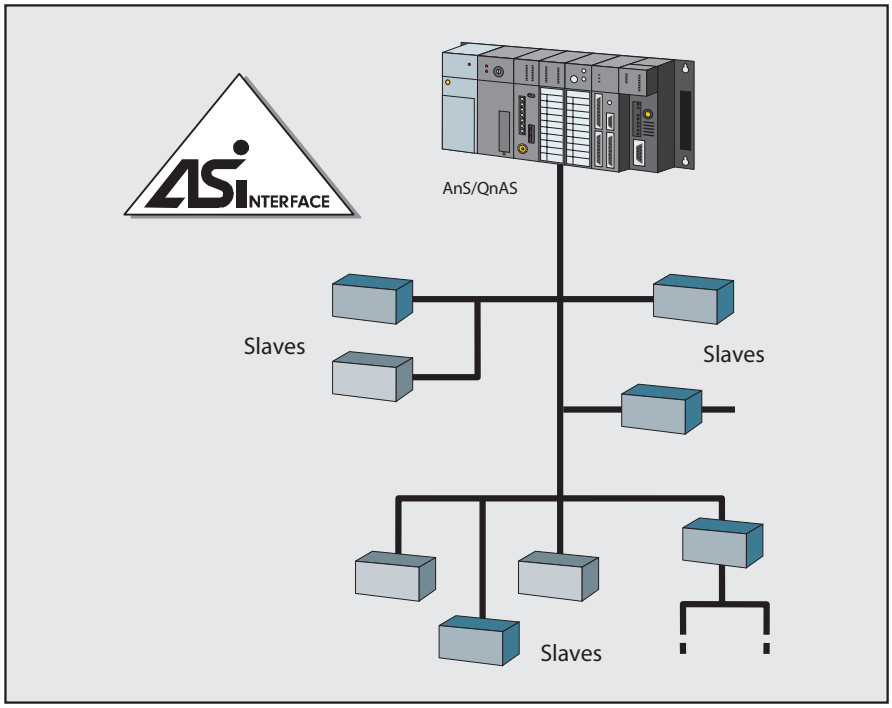
When using a flat cable the modules are connected to the cable via push-through connections while the coding ensures a reverse protection.

## Data exchange

The AS interface supports the connection of conventional sensors and actors following the master-slave principle.

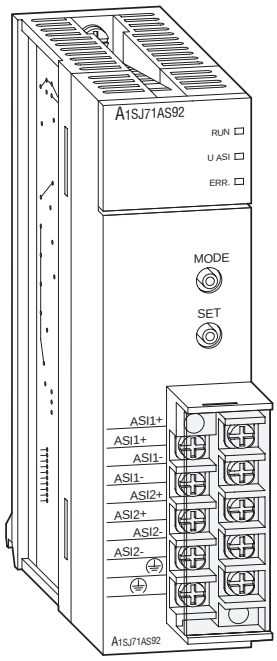
## Administration

The I/O points are assigned electronically through the bus connection or through the PLC program of the AnS/QnAS controller.




| Specifications | | AS interface |
|---|---|---|
| Network management | | Master/Slave |
| Cabling | | Coded twisted-pair cable (unshielded) |
| Data transfer rate | kBit/s | 167 |
| Bus cycle time | | ≤5 ms |
| Max. overall distance | m | 100 (300 with Repeater) |
| Slave units per master | | 31 |
| Repeaters per network | | 2 |

## ■ AS Interface Module A1SJ71AS92




### AS Interface master for AnS-/QnAS-CPUs

The A1SJ71AS92 serves as master module for the connection of the AnS/QnAS series to the AS Interface system.

The A1SJ71AS92 can control up to 62 slave units (31 per channel) with up to 4 inputs and 4 outputs each per address. The addresses of the slave devices across the AS Interface are assigned automatically by the master.

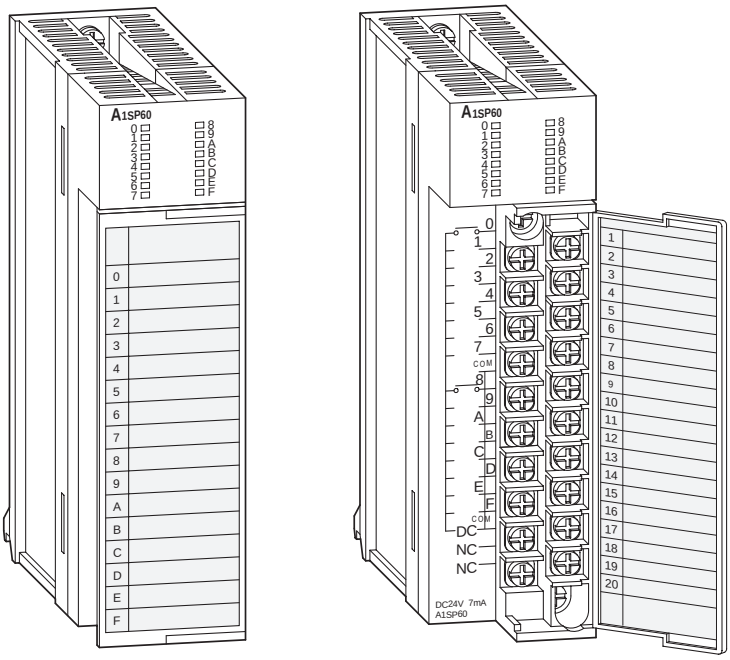
### Special features:

- Up to 62 slave units can be configured across two networks.
- Up to 496 digital inputs/outputs can be driven via the master.
- Communications via AS-I conform coded flat cable or round cable
- Highly efficient error securing system
- Automatic data exchange with the PLC

| Specifications | | A1SJ71AS92 |
|---|---|---|
| Module type | | Master |
| Application range | | MELSEC AnS/QnAS series |
| Max. number of slave stations to be controlled | | 31 x 2 |
| Assignable I/O points | | Max. 2 x124 inputs, 2 x 124 outputs |
| Data transfer rate | | 167 kBaud |
| I/O refresh time | | Max. 5 ms |
| Communications method | | APM modulation |
| Error handling | | Parity check |
| Transmission | method | Bus |
| | distance | 100 m (300 m with repeater) |
| ASI network cable | | Acc. to IEC62026-2 (yellow cable), round cable |
| Assigned I/O points | | 32 |
| External power supply | | ASI power supply (30.5 V DC) |
| Power consumption | mA | 100 |
| Weight | kg | 0.3 |
| Dimensions (W x H x D) | mm | 130 x 34.5 x 93.6 |

| | | |
|---|---|---|
| **Order information** | Art. no. | 129936 |
| **Accessories** | | External AS-I power supply: ASI-PS-2.8, art. no.: 130259 |

## ■ MELSEC AnS Pulse Catch Module




### Digital pulse catch

The A1SP60 is a digital input module capable of detecting narrow pulses independently of the program cycle time.

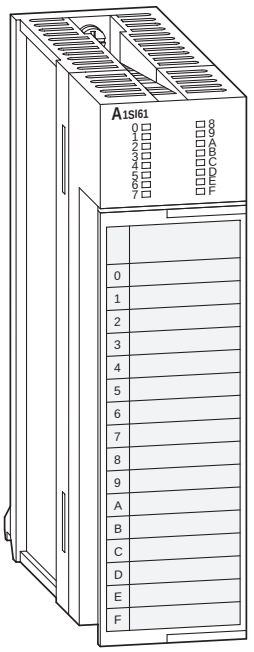
### Special features:

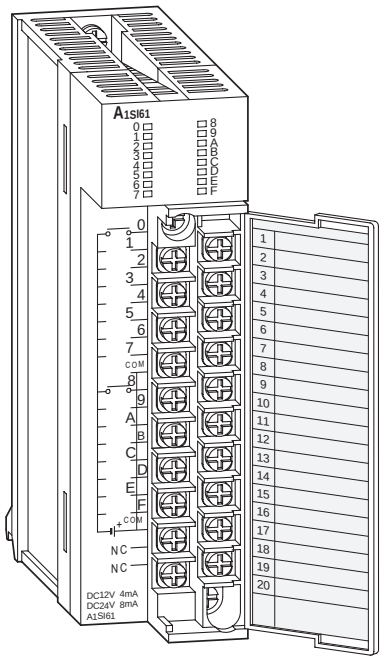
- Possibility of working with pulse function or with normal input function
- In the case of the pulse function, it is ensured that a signal applied at the input (>0.5 ms) is caught.
- By means of DIP switches, it is possible to specify, in groups of 4 input points, whether they are used as normal input points or with pulse catch.
- Galvanic isolation between process and controller by means of an photocoupler is a standard feature

| Specifications | | | A1SP60 |
|---|---|---|---|
| Input points | | | 16 |
| Rated input voltage | | V DC | 24 |
| Operating voltage range | | V DC | 19.2 – 26.4 |
| Max. input points simultaneous ON | | | 100 % |
| Input | resistance | kΩ | ca. 3.3 |
| | current | mA | ca. DC 7 |
| Switch ON | voltage | V | ≥ DC 13 |
| | current | mA | ≥ DC 3.5 |
| Switch OFF | voltage | V | ≤ DC 6.5 |
| | current | mA | ≤ DC 1.7 |
| Response time | OFF ⟶ ON | ms | ≤ 0.5 |
| | ON ⟶ OFF | ms | ≤ 1.0 |
| Min. input pulse width | | ms | 0.5 |
| Status display of inputs | | | LED |
| Isolation | | | All modules 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 20 screw terminals. |
| Applicable wire size | | $mm^2$ | 0.75 – 1.5 |
| Internal power consumption (5 V DC) | | mA | 55 |
| Weight | | kg | 0.19 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 |

| Order information | Art. no. | 33197 |
|---|---|---|

## MELSEC AnS Interrupt Module




### Branching to subroutines

The A1SI61 is suitable for applications in which it is necessary to respond very rapidly to events.

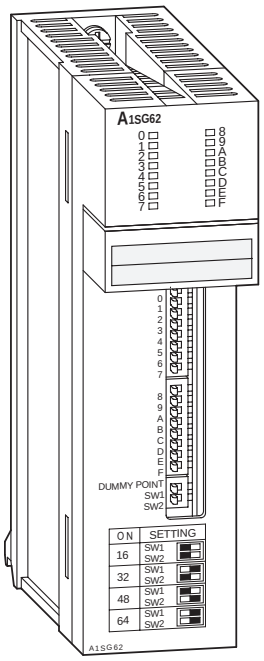
### Special features:

- Every input in this module is assigned 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 an photocoupler is a standard feature
- Only one A1SI61 can be installed to one PLC system

| Specifications | | | A1SI61 |
|---|---|---|---|
| Input points | | | 16 |
| Rated input voltage | | V DC | 12 / 24 |
| Operating voltage range | | V DC | 10.2 – 26.4 |
| Max. input points simultaneous ON | | | 100 % |
| Input | resistance | kΩ | ca. 2.7 |
| | current | mA | ca. DC 4 / 8 |
| ON | voltage | V | ≥ DC 9 |
| | current | mA | ≥ DC 3 |
| OFF | voltage | V | ≤ DC 4 |
| | current | mA | ≤ DC 1 |
| Response time | OFF ⟶ ON | msec | ≤ 0.2 |
| | ON ⟶ OFF | msec | ≤ 0.2 |
| Status display of inputs | | | LED |
| Isolation method | | | All modules fitted with photocoupler isolation between input terminals and internal circuit. |
| No. of occupied I/O points | | | 32 |
| Connection terminal | | | The module is fitted with a terminal block with 20 screw terminals. |
| Applicable wire size | | $mm^2$ | 0.75 – 1.5 |
| Internal power consumption (5 V DC) | | mA | 57 (all points ON) |
| Weight | | kg | 0.2 |
| Dimensions (W x H x D) | | mm | 34.5 x 130 x 93.6 |

| Order information | Art. no. | 33195 |
|---|---|---|

## ■ MELSEC AnS Dummy Modules




### Place keeper and mechanical protection

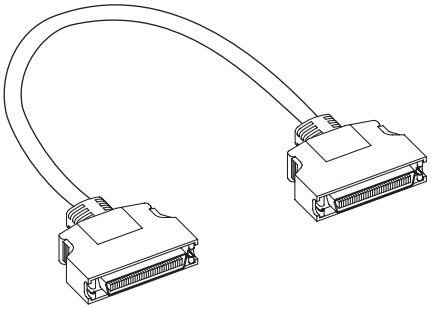
The dummy modules protect unused slots on the base unit from foreign bodies and reserve I/O addresses.

### Special features:

- The A1SG62 has 16 simulation switches by means of which digital inputs can be set and reset.
- Indication of the status of the inputs/outputs by means of LEDs.

| Specifications | | A1SG60 | A1SG62 |
|---|---|---|---|
| I/O points | | 16 | Max. 64 (16, 32, 48 or 64 can be selected by DIP-switches) |
| Application | | Used to protect any vacant slot from dust. | Used to reserve I/O points for a later to install I/O module. |
| Current consumption | mA | — | 60 |
| Weight | kg | 0.08 | 0.13 |
| Dimensions (W x H x D) | mm | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |
| **Order information** | Art. no. | 26596 | 30030 |

## ■ Connection Cable



### Connection cable for subracks

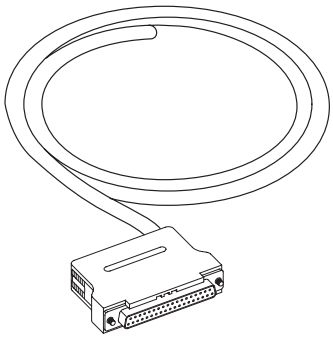
The connection cables A1SC01B, A1SC03B, A1SCO12B and A1SC30B are used for connecting main base units to the extension base units. They have been cut to the correct length for each application.

The A1SC05NB cable is used for connecting MELSEC A series extension base units to AnS/QnAS series main base units.

Connection of a base unit of the AnS/QnAS series to an A870GOT operator panel is also possible.

| Specifications | | A1SC01B | A1SC03B | A1SC12B | A1SC30B | A1SC60B | A1SC05NB |
|---|---|---|---|---|---|---|---|
| For extension base units | type | MELSEC AnS/QnAS | MELSEC AnS/QnAS | MELSEC AnS/QnAS | MELSEC AnS/QnAS | MELSEC AnS/QnAS | MELSEC A to AnS/QnAS, AnS/QnAS to A870GOT |
| Length | mm | 55 | 330 | 1200 | 3000 | 6000 | 450 |
| Ohmic resistance R of the cable | Ω | 0.020 | 0.021 | 0.055 | 0.121 | 0.182 | 0.037 |
| **Order information** | Art. no. | 24979 | 24980 | 24981 | 24982 | 68294 | 24983 |

## ■ Adapter Cable

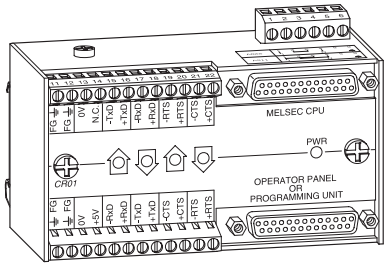


### Assembled cable with D-SUB plug

The cable A32CBL is used for connecting the modules AX82 and AY82 of the MELSEC A series and the modules A1SX81 and A1SY81 of the MELSEC AnS series.

| Specifications | | A32CBL | A32CBL-5m |
|---|---|---|---|
| Connection cable for | type | AX82, AY82 (MELSEC A), A1SX81, A1SY81 (MELSEC AnS) | AX82, AY82 (MELSEC A), A1SX81, A1SY81 (MELSEC AnS) |
| Inputs/outputs | | 32 | 32 |
| Length | m | 3 | 5 |
| **Order information** | Art. no. | 3895 | 56052 |

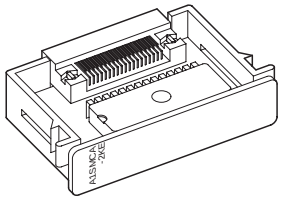
## ■ Interface Converter CR01-R2/R4 SET and CR01-R4/R4




This module is a signal amplifier with photocoupler isolation for RS422 signals. It is used to connect a PLC with external devices like operation panels or a personal computer, especially when a potential isolation is required and when the wiring length takes more than 15 meters.

| Specifications | | CR01-R4/R4 | CR01-R2/R4 SET |
|---|---|---|---|
| Interface converter | | RS422 ↔ RS422 | RS422 ↔RS232 |
| **Order information** | Art. no. | 56173 | 56172 |

## MELSEC AnS Memory Cassettes



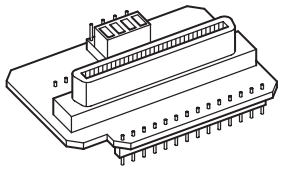
### MELSEC AnS memory cassettes

The AnSCPUs all have a permanently installed RAM with 8 k, 14 k, 30 k or 60 k steps. EPROM and EEPROM memory cassettes are available for permanent storage.

The EPROMs are programmed via the A6WA-28P (A1SNMCA-8KP) or A2SWA-28P (A2SNMCA-□□KP) with the aid of MELSEC MEDOC *plus*.

| Specifications | | A1SNMCA-2KE | A1SNMCA-8KE | A1SNMCA-8KP | A2SMCA-14KP | A2SNMCA-30KE | A2SMCA-30KP | A2SMCA-60KE |
|---|---|---|---|---|---|---|---|---|
| Memory cassette | type | EEPROM | EEPROM | EPROM | EPROM | EEPROM | EPROM | EPROM |
| For CPU type | | A1SH | A1SH | A1SH | A2SH | A2SH | A2AS | A2AS |
| Memory capacity | kbyte | 8 | 20 | 20 | 32 | 64 | 64 | 128 |
| | instructions | 2 k | 8 k | 8 k | 14 k | 30 k | 30 k | 60 k |
| **Order information** | Art. no. | 68835 | 68834 | 68832 | 38066 | 68831 | 54922 | 68000 |

## MELSEC AnS Adapter Units

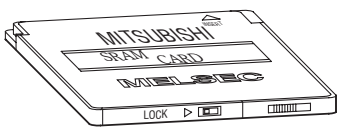


### EPROM write adapter

The write adapters A2 SWA-28P and A6 WA-28P are used for writing on the memory cassettes A2S(N)MCA-□□KP and A1SMCA-□□ of the MELSEC AnS series.

| Specifications | | A2 SWA-28P | A6 WA-28P |
|---|---|---|---|
| For memory cassettes | type | A2SMCA-14KP/30KP | A1SMCA-8KP |
| **Order information** | Art. no. | 38069 | 24987 |

## MELSEC QnAS Memory Cards



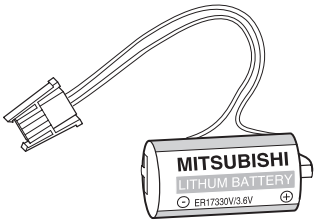

### MELSEC QnAS memory cards

The QnASCPUs all have a permanently installed RAM. This memory can be extended with a variety of PCMCIA-memory cards.

The combination cards (with two memory types) have a non-volatile EEPROM memory which is programmable by MELSEC MEDOC *plus*.

| Specifications | | Q1MEM-1MS | Q1MEM-2MS | Q1MEM-256SE | Q1MEM-512SE | Q1MEM-1MSE |
|---|---|---|---|---|---|---|
| Memory | type | Card | Card | Card | Card | Card |
| Memory capacity | | 1 MB SRAM | 2 MB SRAM | 128 kB SRAM, 128 kB EEPROM | 256 kB SRAM, 256 kB EEPROM | 512 kB SRAM, 512 kB EEPROM |
| **Order information** | Art. no. | 64197 | 64196 | 64193 | 64204 | 68031 |

## Battery A6BAT

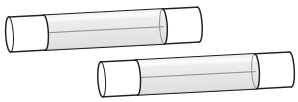



The A6BAT lithium cell battery is already installed in every MELSEC A series memory cassette.

The battery protects the data in the cassette RAM when the power supply is switched off or in the event of power failures. It has a service life of around five years.

| Specifications | | A6BAT |
|---|---|---|
| Voltage | V DC | 3,6 |
| Backup time during power failure | | A3NMCA-0 : 10800 h<br>A3NMCA-40: 1400 h |
| Dimensions (Ø x H) | mm | Ø16 x 30 |
| **Order information** | Art. no | 4077 |

## Fuses



The output modules A1SY22, A1SY80 and A1SY81 are equipped with dedicated fuses for device protection.

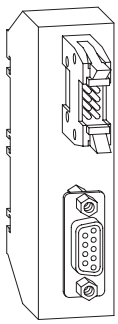
| Specifications | | HM50C | LM50 | LM32 |
|---|---|---|---|---|
| For module | | A1SY22 | A1SX80 | A1SY81 |
| Rating | | 5 A | 5 A | 3.2 A |
| Type | | Solder fuse | Plug fuse | Plug fuse |
| **Order information** | Art. no | 38361 | 32301 | 32303 |

## Dust Cover

If I/O devices are mounted on an extension base unit, then the first module on the extension base unit should be equipped with a dust cover.

| Specifications | | Dust Cover |
|---|---|---|
| Material | | Plastics |
| Dimensions (W x H) | mm | 44 x 129 |
| **Order information** | Art. no. | 32299 |

## Local System Extension Set for the MT Series

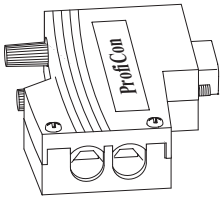


For the extension of the MT series to a second connecting level the local system extension MT-LE and the connecting cable MT-LE-CBL50 are required.

The extension and the cable are available only as complete set, which is called MT-LE-SET.

| Specifications | | MT-LE-SET |
|---|---|---|
| Application | | MT series |
| Cable length | m | 0.5 |
| Dimensions (W x H x D) | mm | 22.5 x 97 x 36 |
| **Order information** | Art. no. | 69759 |

## ProfiConT Profibus Connector

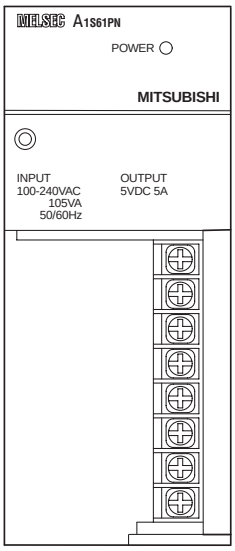


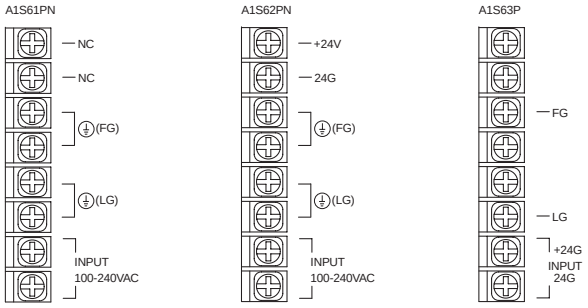

The ProfiCon bus connector plug is designed for connecting DIN 19245 standard Profibus components with data transfer rates of up to 12 Mbaud.

The connector is available with a selectable termination resistor.

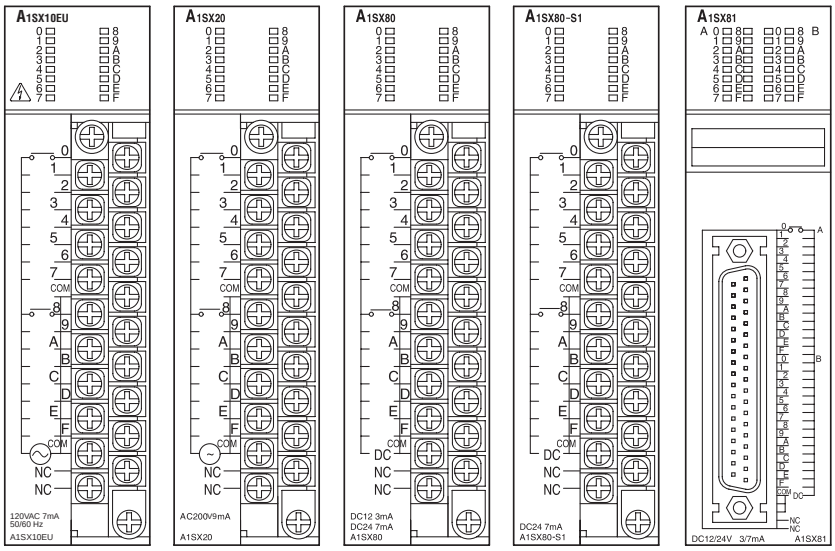
| Specifications | | ProfiConT |
|---|---|---|
| Data rate 12 Mbit/s | | supported |
| Terminator | | Yes (selectable) |
| **Order information** | Art. no. | 87035 |

## MELSEC AnS/QnAS Power Supply Modules

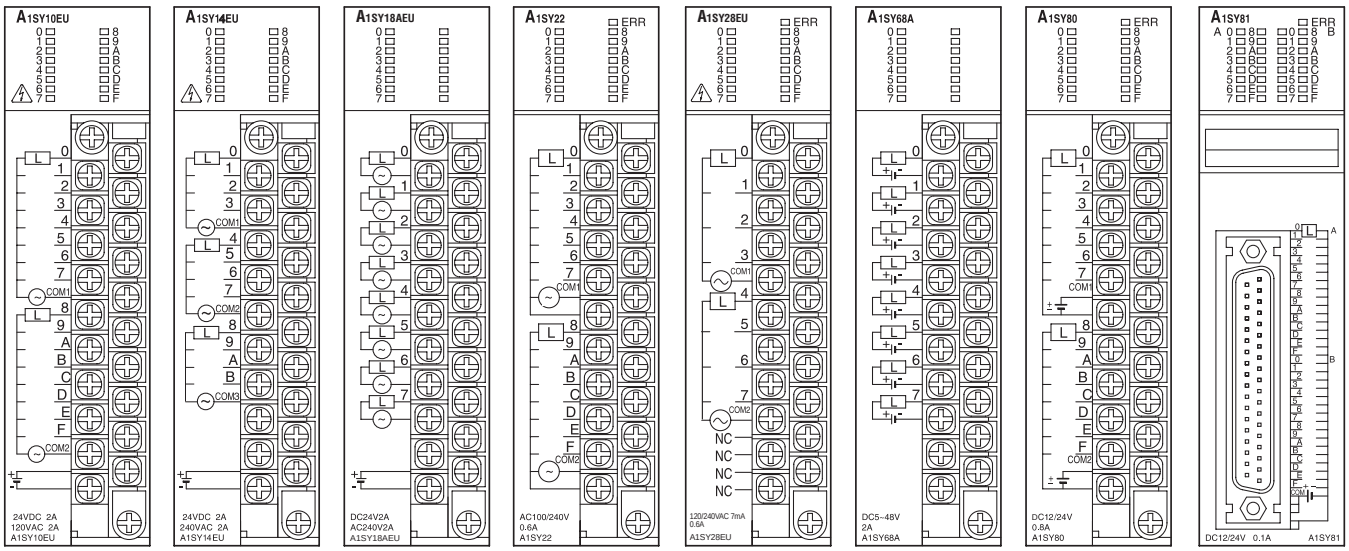


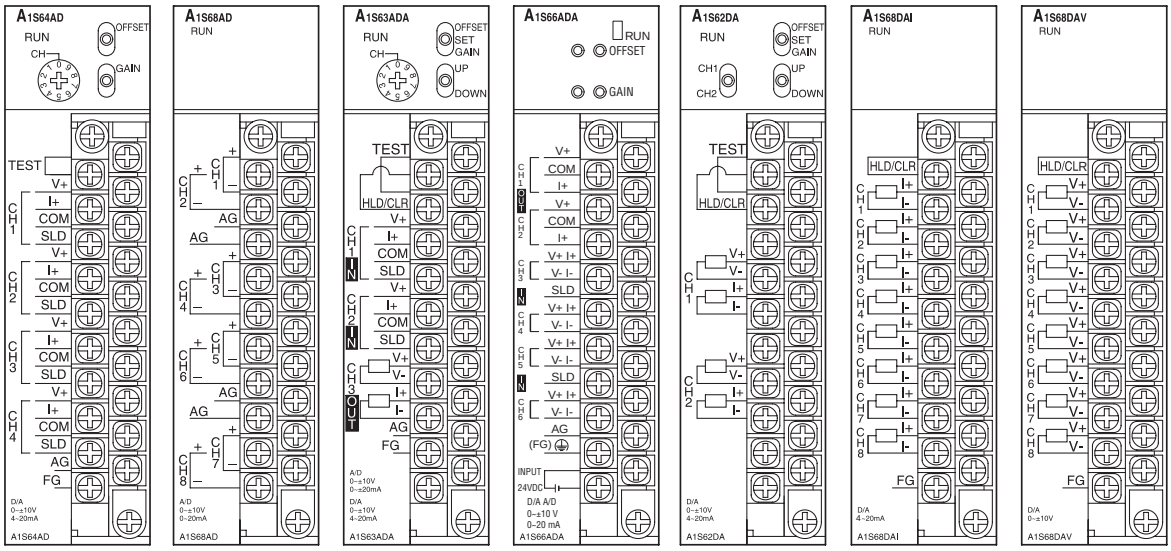

## MELSEC AnS/QnAS Digital Input Modules



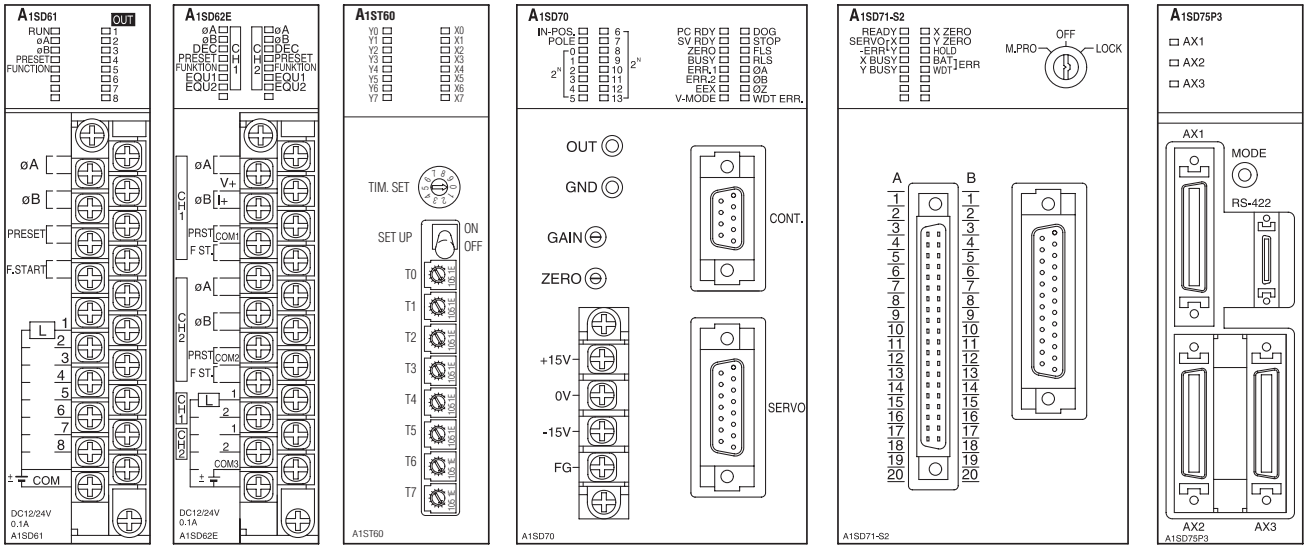

## MELSEC AnS/QnAS Digital Output Modules



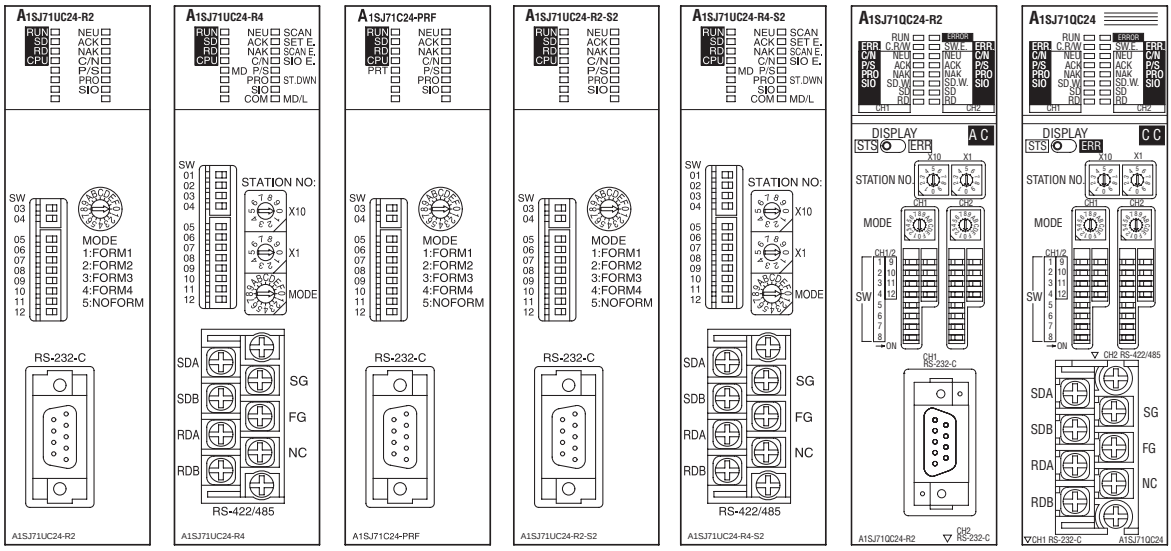
## ■ MELSEC AnS Analog Input/Output Modules



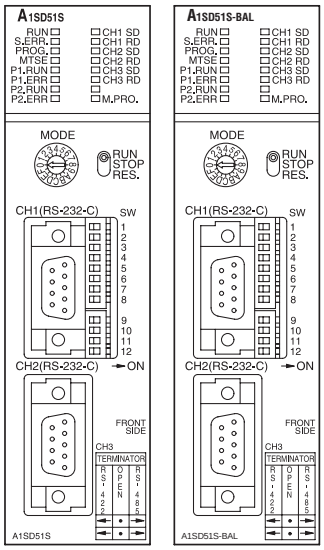

## ■ MELSEC AnS Counter, Timer and Positioning Modules



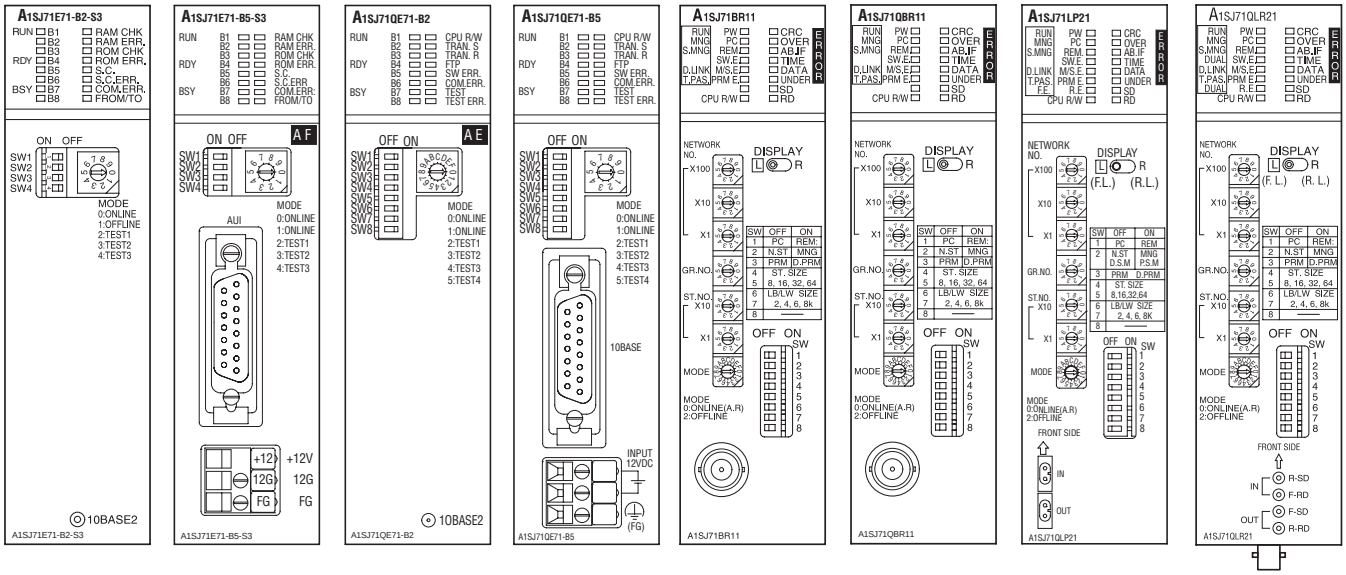
## MELSEC AnS/QnAS Interface Modules



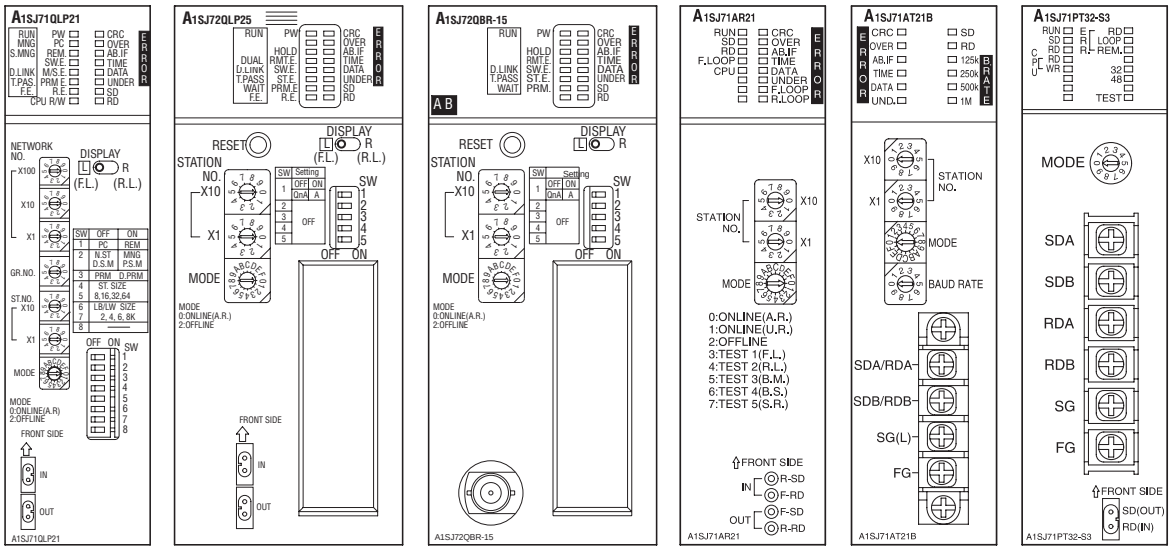

## MELSEC AnS/QnAS Communications Modules



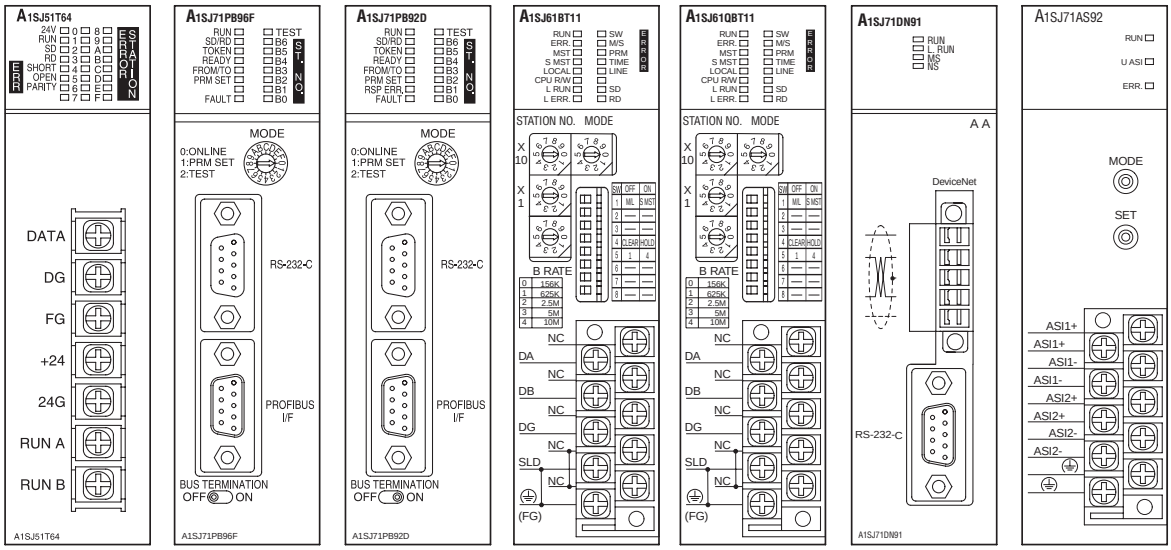

## MELSEC AnS/QnAS Communications Modules for Ethernet and MELSECNE4T Networks



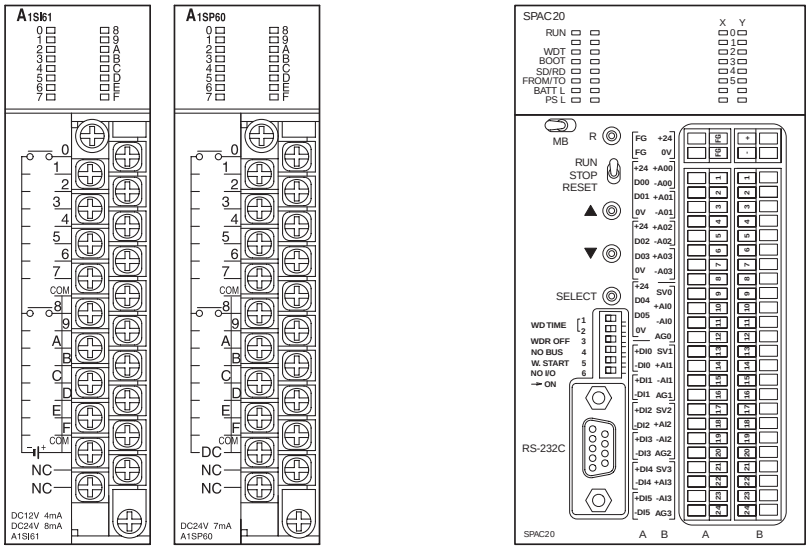
## MELSEC AnS/QnAS Communications Modules for MELSECNET Networks



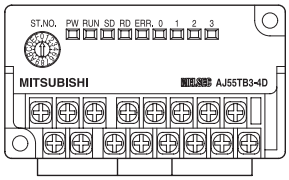

## MELSEC AnS/QnAS Communications Modules for I/O-Link, Profibus, CC-Link, DeviceNet and AS Interface




## MELSEC AnS/QnAS Pulse Catch and Interrupt Modules, Co-Processor module



## ■ MELSEC I/O Link Decentralised Digital Input/Output Modules




AJ55TB3-4D

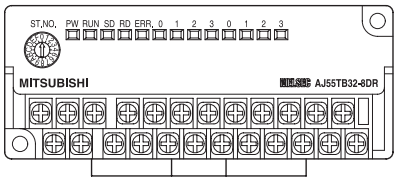
| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 |
| DATA | FG | +24V | I/O24A | X0 | X1 | X2 | X3 | DG | 24G | I/O24B | COMB | COMA | COMB | COMA | COMB |

AJ55TB32-4DR

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 |
| DATA | FG | +24V | I/O24A | X0 | X1 | Y0 | Y1 | DG | 24G | I/O24B | COMB | COMA | COM1 | COM1 | COM2 |

AJ55TB2-4R

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 |
| DATA | FG | +24V | I/O24V | Y0 | Y1 | Y2 | Y3 | DG | 24G | I/O24G | COM1 | COM1 | COM1 | COM1 | COM2 |




AJ55TB3-8D

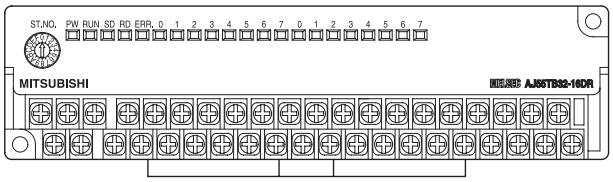
| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 23 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| DATA | FG | +24V | I/O24A | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | DG | 24G | I/O24B | COMB | COMA | COMB | COMA | COMB | COMA | COMB | COMA | COMB |

AJ55TB32-8DR

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 23 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| DATA | FG | +24V | I/O24A | X0 | X1 | X2 | X3 | Y0 | Y1 | Y2 | Y3 | DG | 24G | I/O24B | COMB | COMA | COMB | COMA | COMB | COM1 | COM1 | COM1 | COM2 |

AJ55TB2-8R

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 23 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| DATA | FG | +24V | I/O24V | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | DG | 24G | I/O24G | COM1 | COM1 | COM1 | COM1 | COM1 | COM1 | COM1 | COM1 | COM2 |




AJ55TB3-16D

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 23 | 25 | 27 | 29 | 31 | 33 | 35 | 37 | 39 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 |
| DATA | FG | +24V | I/O24A | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 | XA | XB | XC | XD | XE | XF | DG | 24G | I/O24B | COMB | COMA | COMB | COMA | COMB | COMA | COMB | COMA | COMB | COMA | COMB | COMA | COMB | COMA | COMB | COMA | COMB | COMA | COMB |

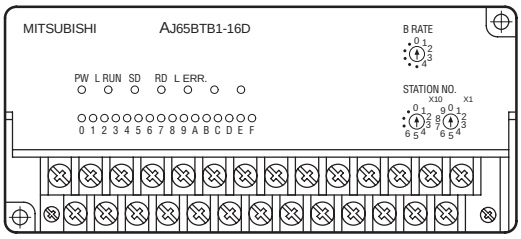
AJ55TB32-16DR

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 23 | 25 | 27 | 29 | 31 | 33 | 35 | 37 | 39 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 |
| DATA | FG | +24V | I/O24A | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | DG | 24G | I/O24B | COMB | COMA | COMB | COMA | COMB | COMA | COMB | COMA | COMB | COMA | COMB | COM1 | COM1 | COM1 | COM1 | COM1 | COM1 | COM1 | COM2 |

AJ55TB2-16R

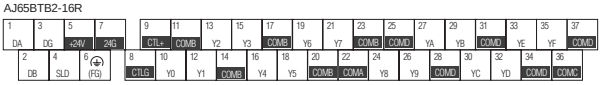
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 17 | 19 | 21 | 23 | 25 | 27 | 29 | 31 | 33 | 35 | 37 | 39 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 |
| DATA | FG | +24V | I/O24V | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | Y8 | Y9 | YA | YB | YC | YD | YE | YF | DG | 24G | I/O24G | COM1 | COM1 | COM1 | COM1 | COM1 | COM1 | COM1 | COM1 | COM2 | COM2 | COM3 | COM3 | COM3 | COM3 | COM3 | COM3 | COM3 | COM4 |

## CC-Link Decentralised Digital Input/Output Modules




AJ65BTB2-16D

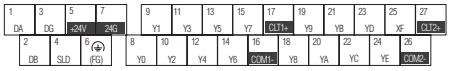
AJ65BTB2-16R



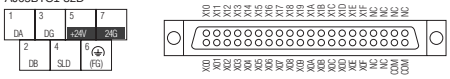
AJ65BTB1-16D

AJ65BTB1-16DT

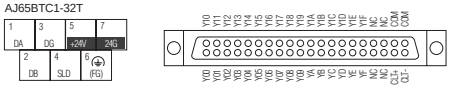
AJ65BTB1-16T



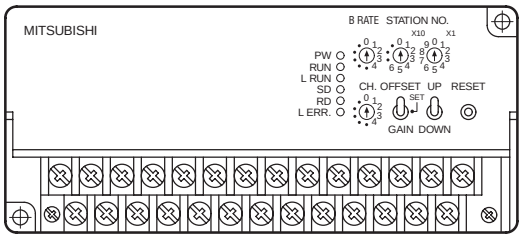
AJ65BTC1-32D



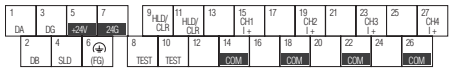
AJ65BTC1-32T



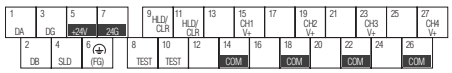
## CC-Link Decentralised Digital Input/Output Modules and Special Function Modules



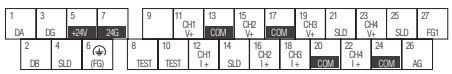

AJ65BT-64DAI



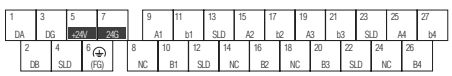
AJ65BT-64DAV



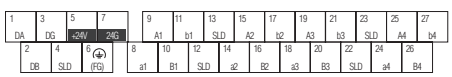
AJ65BT-64AD



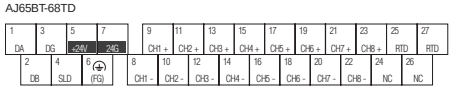
AJ65BT-64RD3

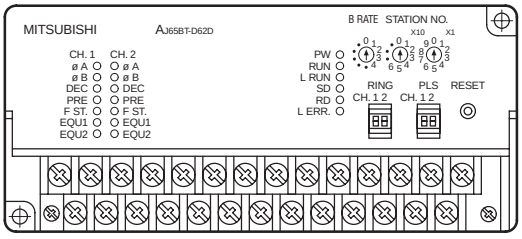


AJ65BT-64RD4

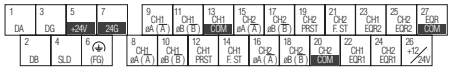


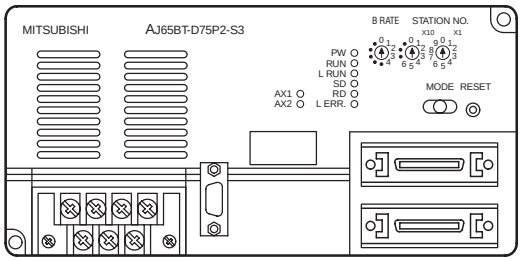
AJ65BT-68TD



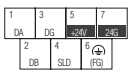


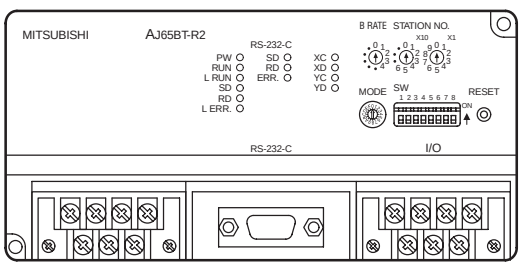

AJ65BT-D62D





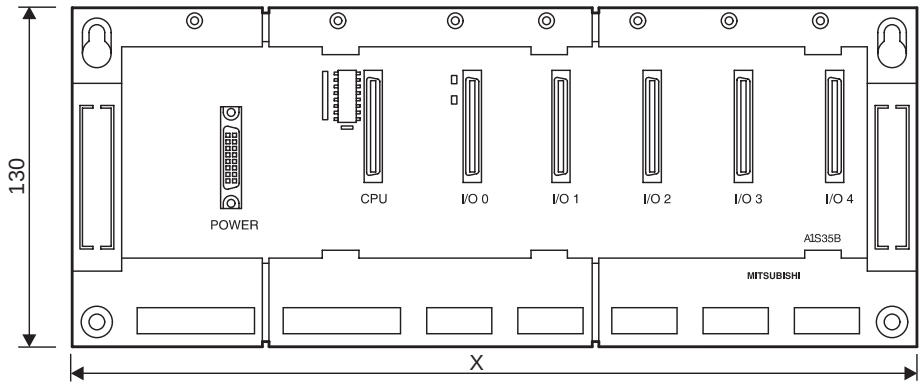

AJ65BT-D75P2-S3





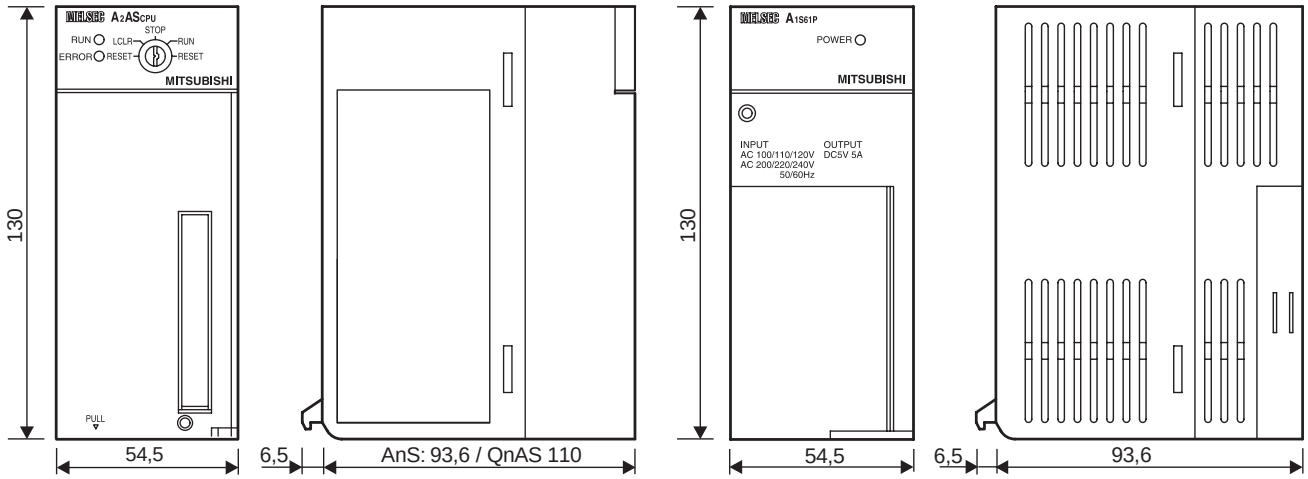

AJ65BT-R2

## Base Units

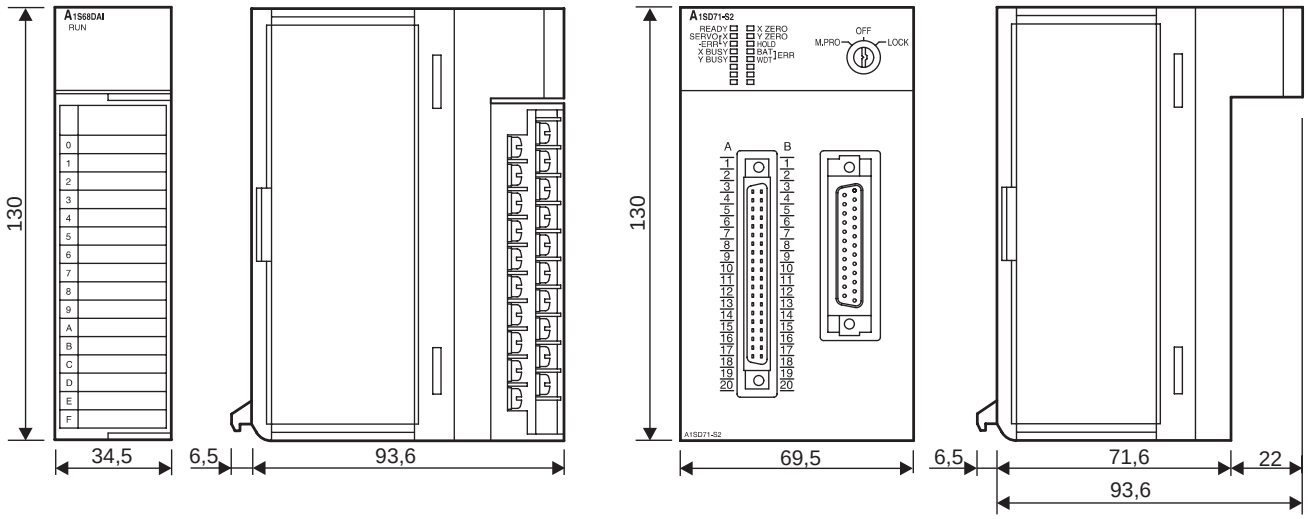



| Type | X (in mm) |
|---|---|
| A1S32B-E | 220 |
| A1S33B-E | 255 |
| A1S35B-E | 325 |
| A1S38B-E | 430 |
| A1S38HB | 430 |
| A1S52B-S1 | 155 |
| A1S55B-S1 | 260 |
| A1S58B-S1 | 365 |
| A1S65B-S1 | 315 |
| A1S68B-S1 | 420 |

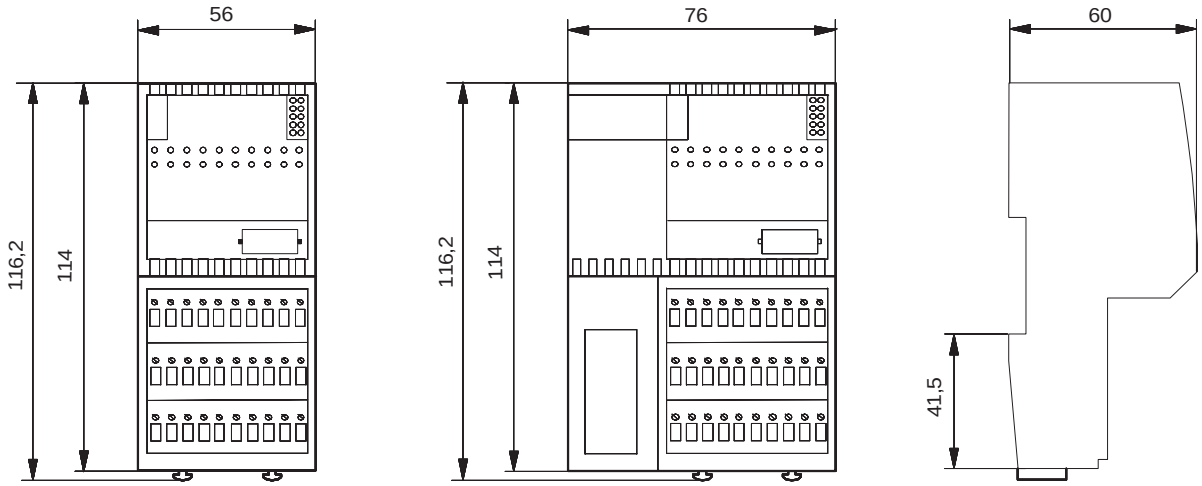
## CPUs and Power Supply Modules

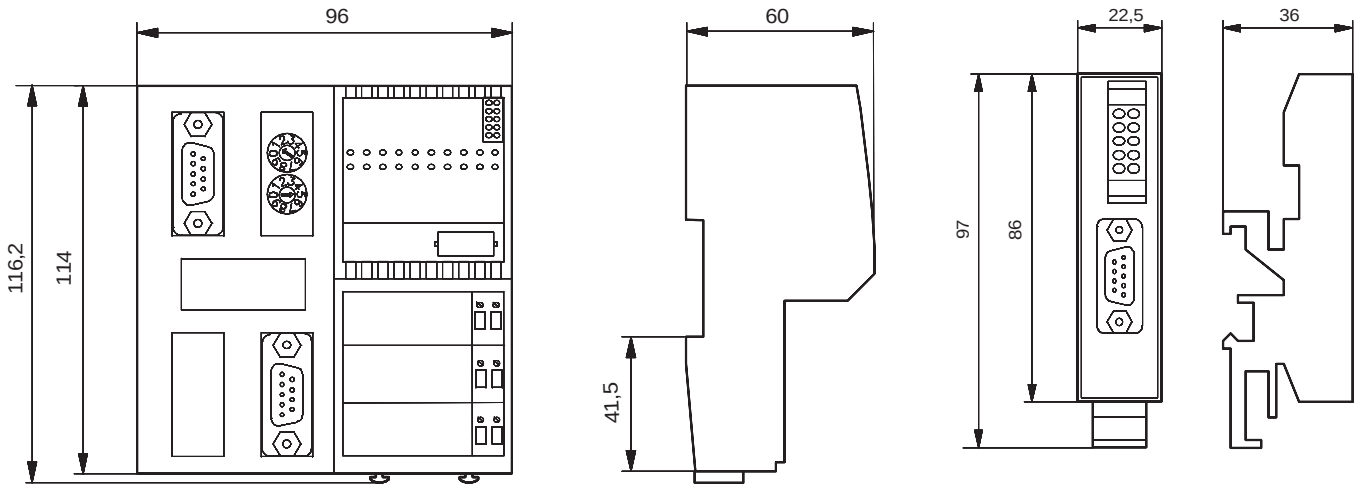



## Digital and Special Function Modules

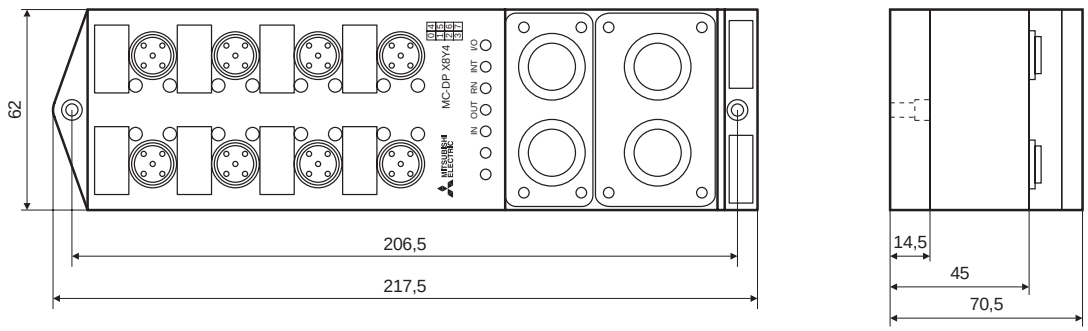


## ■ Profibus/DP MT Modules

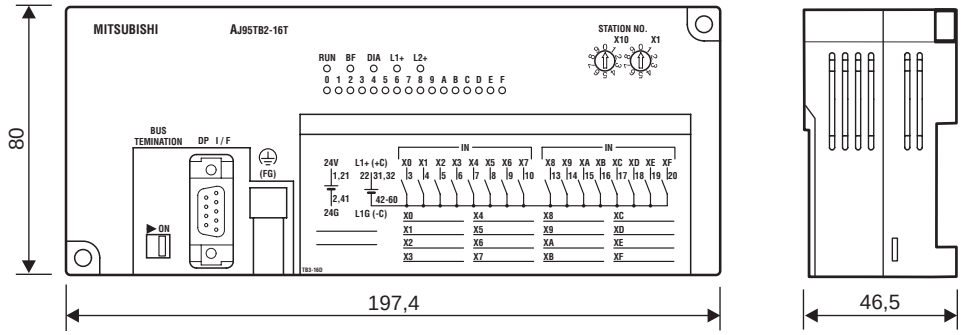


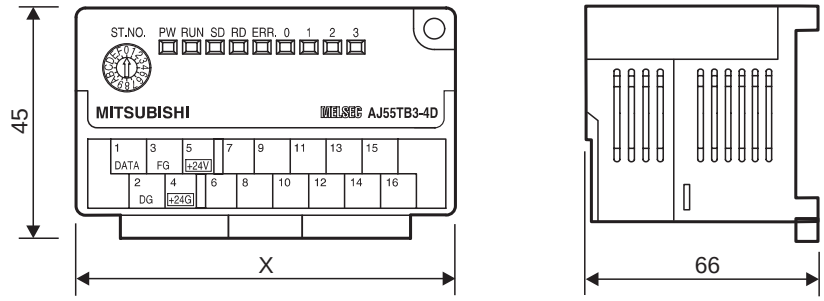

## ■ Profibus/DP MC Modules



## ■ Profibus/DP Compact I/O Modules

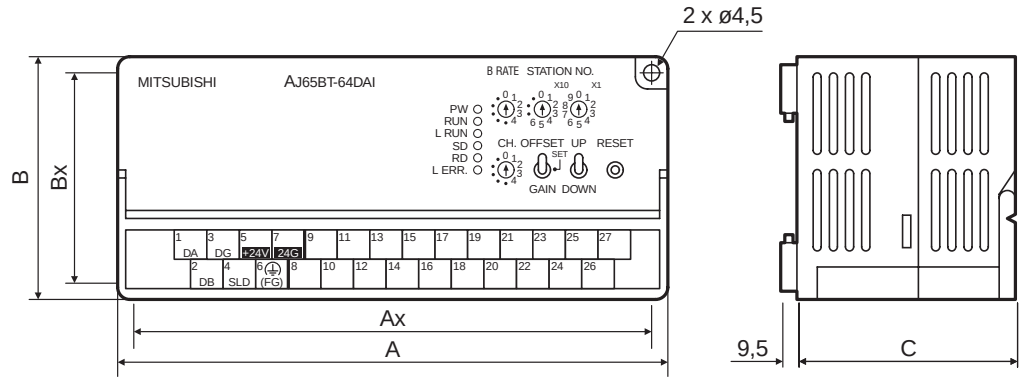



## ■ MELSEC AnS/QnAS Decentralised Input/Output Modules




| Type | X (in mm) |
|---|---|
| AJ55TB3-4D | 82 |
| AJ55TB3-8D | 114 |
| AJ55TB3-16D | 177 |
| AJ55TB32-4DR | 82 |
| AJ55TB32-8DR | 114 |
| AJ55TB32-16DR | 177 |
| AJ55TB2-4R | 82 |
| AJ55TB2-8R | 114 |
| AJ55TB2-16R | 177 |

## ■ CC-Link Decentralised Input/Output Modules and Special Function Modules




| Type | I/O Modules | | | | | | | Analog modules | | | | Special Funktion Modules | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AJ65BTB1-16D | AJ65BTB2-16D | AJ65BTC1-32D | AJ65BTB1-16DT | AJ65BTB1-16T | AJ65BTC1-32T | AJ65BTB2-16R | AJ65BT-64AD | AJ65BT-64DAV/DAI | AJ65BT-68TD | AJ65BT-64RD3/4 | AJ65BT-D62 | AJ65BT-D75P2-S3 | AJ65BT-R2 |
| A | 151.9 | 197.4 | 165 | 151.9 | 151.9 | 165 | 197.4 | 151.9 | 151.9 | 151.9 | 151.9 | 151.9 | 170 | 170 |
| Ax | 142.9 | 188.4 | 156 | 142.9 | 142.9 | 156 | 188.4 | 142.9 | 142.9 | 142.9 | 142.9 | 142.9 | 161 | 161 |
| B | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 80 | 80 |
| Bx | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 71 | 71 |
| C | 46 | 46 | 46 | 46 | 46 | 46 | 46 | 63 | 63 | 63 | 63 | 63 | 63.5 | 63.5 |

## 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:

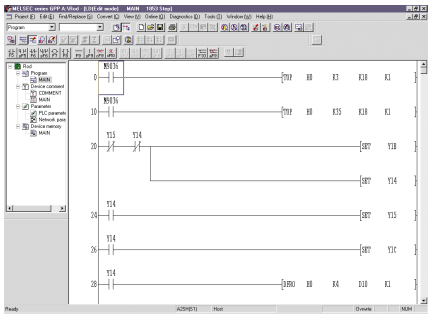
- Programming packages like GPP/WIN and MELSEC MEDOC *plus*
- Network configuration software MELSEC ProfiMap
- Visualization software MX SCADA
- Software for a dynamic data exchange like MXChange
- Various development software for operator terminals (refer to the Technical Catalogue HMI)

GPP/WIN is recommended as a cost-effective beginners package for the A/Q series. This package offers a quick and easy introduction to programming.

For structured programming the IEC1131 conform programming software MELSEC MECOC *plus* is recommended.

For detailed information please order our separate MELSoft brochure.

## ■ GPP/WIN



GPP/WIN is the standard programming software for the MELSEC A/Q series and combines all functions of MELSEC MEDOC with the user guidance of Microsoft Windows.

With GPP/WIN 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.

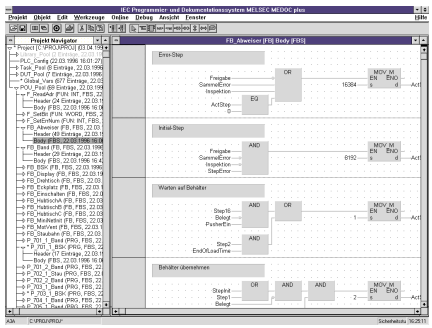
Besides efficient monitoring and diagnostics functions GPP/WIN features an offline simulation of any PLC type from the FX0S to the Q4AR.

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

GPP/WIN can be run under Windows 95 and Windows NT.

| Software | | MM GPP/WIN | |
|---|---|---|---|
| Series | | All MELSEC PLCs | All MELSEC PLCs |
| Language | | English / German | English / German |
| Disk type | | CD ROM | CD ROM |
| Included accessory | | Converter | — |
| **Order information** | Art. no. | 126047 | 126048 |

## ■ MELSEC MEDOC *plus*



MELSEC MEDOC *plus* provides all functions of the pre-mentioned programs and meets the programming standard for the future: IEC 1131.3. This makes MELSEC MEDOC *plus* ready for the programming standard of the future and offers in addition the basis for the on-leading programming of the MELSEC A and Q series.

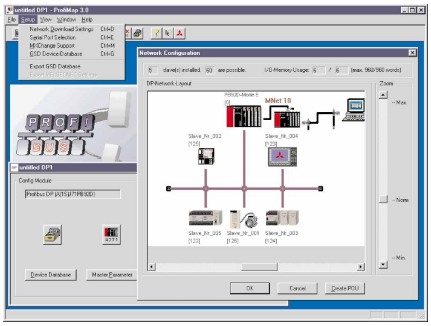
MELSEC MEDOC *plus* can be run under Windows 3.11 and Windows 95/98.

The software is supplied complete with an SC-09N serial interface cable.

| Software | | S-Set | Q-Set |
|---|---|---|---|
| Series | | AnS(H), AnAS, AnUS, FX family | All MELSEC PLCs |
| Language | | English / German | English / German |
| Disk type | | CD ROM | CD ROM |
| **Order information** | Art. no. | 126810 | 126811 |

# Network Configurations Software, Visualization Software and Software for Dynamic Data Exchange

## ■ MELSEC ProfiMap



MELSEC ProfiMap V3.0 is a user friendly configurations software for open networks like MAP 3.0/ETHERNET and PROFIBUS/DP or PROFIBUS/FMS.

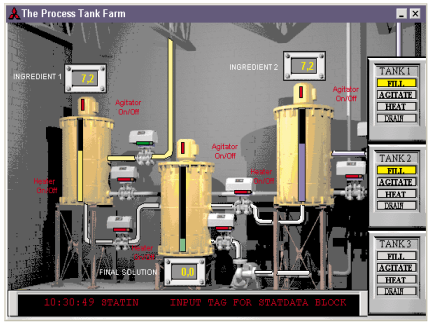
The software package is a 32 bit application for Windows 95 and Windows NT4.0. Configuration of all PROFIBUS modules for the MELSEC Ans/QnAS and A/Q series is possible.

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 ProfiMap V3.0 enables the download of all configuration data via an overriding network.

| Software | | ProfiMap 3.0 CD-Set | ProfiMap 3.0 CD |
|---|---|---|---|
| Supported master modules for the Mitsubishi MELSEC AnS/QnAS and A/Q series | | Profibus/DP: A1SJ71PB92D, AJ71PB92D<br>Profibus/FMS: A1SJ71PB96F, AJ71PB96F<br>MAP3.0/Ethernet: AJ71M56EF2 | Profibus/DP: A1SJ71PB92D, AJ71PB92D<br>Profibus/FMS: A1SJ71PB96F, AJ71PB96F<br>MAP3.0/Ethernet: AJ71M56EF2 |
| Language | | English | English |
| Configuration cable | | ProfiCab is included | ProfiCab is not included |
| Disk type | | CD ROM | CD ROM |
| **Order information** | Art. no. | 128585 | 128586 |

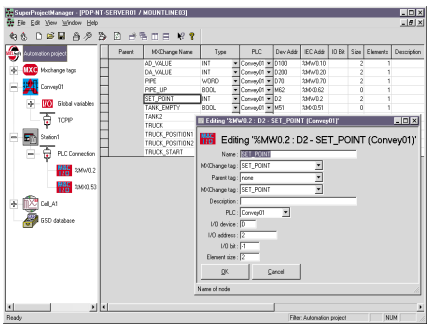
## ■ MELSEC MX SCADA




MELSEC MX SCADA is a process visualisation system that can handle everything from simple installations to complex production control systems. The software package can administer up to 100000 objects. A variety of interfaces are supported, including ETHERNET. The software runs under Windows 95 and Windows NT and is available in a variety of different versions geared to the objects to be handled.

| Software | | Development version | Run-time version | DEMO version |
|---|---|---|---|---|
| Series | | All MELSEC PLC | All MELSEC PLC | All MELSEC PLC |
| Language | | English | English | English |
| Disk type | | CD ROM | CD ROM | CD ROM |
| **Order information** | Art. no. | On request | On request | 65135 |

## ■ MELSEC MX Change



MELSEC MXChange 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 MXChange operates across a network, any variable once declared can be used by all other systems connected to the database.

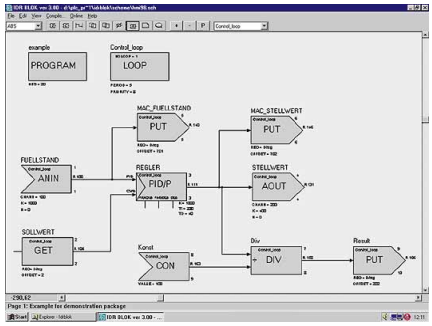
Through this method following the principle "define once and use anywhere" the development time can even be decreased drastically.

The software runs under Windows 95 and Windows NT.

| Software | | MXChange Network | Stand-alone | Stand-alone |
|---|---|---|---|---|
| Language | | English | English | English |
| Executable tags | | 10.000 | 10.000 | 500 |
| Disk type | | CD ROM | CD ROM | CD ROM |
| **Order information** | Art. no. | 129639 | 129640 | 129641 |

## Graphical Programming for Closed-loop Control Systems

### ■ MELSEC IDR BLOK




IDR-BLOK is a user-friendly development tool for programming closed-loop applications using PLC technology. Configuring a controlled system couldn't be simpler – you just assemble it graphically by placing function blocks on the screen and the integrated compiler than generates the code for the PLC. The open design means that the user can intervene and change the control parameters at any time with the PLC program.

Additional function blocks for autotuning, fuzzy logic and ATHC are available in combination with the run-time module IDR10F-ADU.

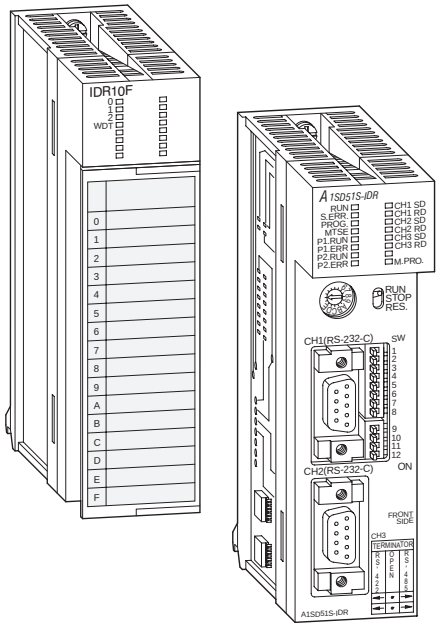
IDR-BLOK turns a sequential logic controller into a multi-loop controller. It is the closed-loop programming software package for all AnSH/QnAS* controllers (*QnAS only in combination with a co-processor module).

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

| Software | | Full version | Compact version | Demo version |
|---|---|---|---|---|
| Application | CPU | AnSH (AnN)* | | |
| | mit Co-Prozessor* | AnAS, QnAS (AnU, AnA, QnA)* | | |
| Max. used blocks per application | | 1.024 | 64 | 16 |
| Language | | English | | |
| Disk type | | CD ROM | | |
| **Order information** | Art. no. | 129666 | 129665 | on request |

* For the AnN, AnU, AnA and QnA series the following accessories are required:
connection cable A1SC05NB (art.no. 24983) and extension base unit A1S52B-S1 (art.no. 39667).

### ■ RUN-Time Products for IDR BLOK



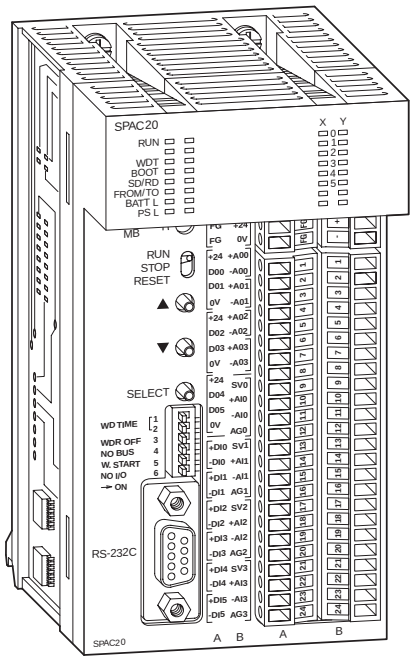

To use the IDR-BLOK software the hereafter described run-time modules are necessary. These modules are available as single modules or within a bundle package.

The IDR function module IDR10F is an integrated necessary part of the run-time package. It provides supervisory functions for the customer with digital output watch dog alarm signals and protects the process control against unexpected troubles.

The A1SD51S-IDR is a co-processor module which is a standard MELSEC high-speed communication module A1SD51S with a preloaded IDR BLOK interpreter.

| Specifications | | IDR10F-STD | IDR10F-ADV | IDR bundle 1 | IDR bundle 2 |
|---|---|---|---|---|---|
| Shipping contents | | 1 x IDR10F-STD | 1 x IDR10F-ADV | IDR-BLOK software, 1 x IDR10F-STD, 1 x A1SD51S-IDR | IDR-BLOK software, 1 x IDR10F-ADV, 1 x A1SD51S-IDR |
| Program features | Function blocks | Max. 1024 | Max. 1024 | Max. 1024 | Max. 1024 |
| | Additional functions | — | Fuzzy logic, GAT, ATHC | — | Fuzzy logic, GAT, ATHC |
| Software | | — | — | IDR-BLOK 4.10 | IDR-BLOK 4.10 |
| Module dimensions | | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 | 34.5 x 130 x 93.6 |
| **Order information** | Art. no. | 125359 | 129658 | 87511 | on request |

## Co-Processor Module SPAC20




### MELSEC SPAC20

The SPAC20 is a co-processor module for special process applications and high-end process control. It is the ideal supplementation for the IDR BLOK Software.

Furthermore self-developed control applications can be realized with C programming language.

### Special features:

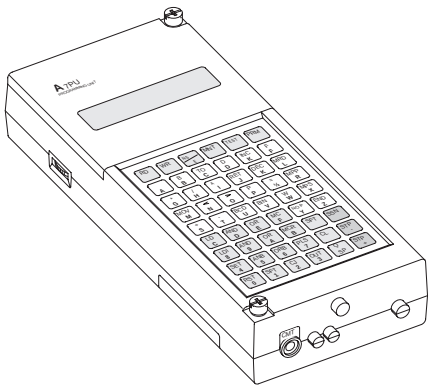
- C programmed user's tasks
- Communication with PLC processor via fast back plane bus
- Real-time execution
- Special non-linear processes with fast FUZZY controller
- Integrated fast digital and analog inputs and outputs
- Stand-alone possibility

| Specifications | | SPAC 20 |
|---|---|---|
| Working environment | | MELSEC AnS/QnS or AnU/QnA* series PLCs or as stand alone device without CPU |
| Processor | | 40 MHz Texas Instruments TMS 320C32 DSP with floating point |
| Memory | | 2 MB RAM battery backed-up, 2 MB FLASH |
| Peripheral communication | | RS232C, up to 56 Kbaud |
| Digital inputs | Number | 6 |
| | Response time | < 20 µs in high-speed mode |
| | Voltage | 24 V (OFF < 5V, ON > 12V) |
| | Nominal input current | 7.7 mA |
| | Max. input voltage range | -24 V bis +40 V |
| | Frequency meters | 4 digital inputs can be used as frequency meters (up to 20 kHz each) |
| | Galvanic isolation | Separate for each channel, no common |
| Digital outputs | Number | 6 |
| | Nominal current | 0.5 A |
| | Protection | Short-circuit, thermal overload, reverse polarity |
| | Galvanic isolation | Between each pair of outputs and A-BUS |
| Analog inputs | Number | 4 |
| | Sampling rate | 80 µs in fast mode, 160 µs in normal mode |
| | Resolution | 16 bits |
| | Galvanic isolation | Between analog common and A-BUS |
| | Voltage | -10 V to +10 V DC |
| | Current | -20 mA to +20 mA |
| | Optional Piggy back modules | Pt-100/Pt-1000, R100/R1000 Ω, separate galvanic isolation 4–20 mA |
| Analog outputs | Number | 4 |
| | Refresh rate | 80 µs in fast mode, 160 µs in normal mode |
| | Resolution | 12 Bit + sign in voltage mode, 12 bit in current mode |
| | Galvanic isolation | Between analog common and A-BUS |
| | Voltage | ±10 V DC |
| | Current | 0/4 to 20 mA |
| | Protection | Short-circuit in voltage mode |
| Power supply | From the back plane | Approx. 0.4 A at 5 V DC |
| | External voltage | 24 V DC (±20 %) |
| | Current | Approx. 15 mA for digital outputs; up to 200 mA for analog I/O board |
| Programmable with | | IDR BLOK and/or TI "C" programming language |

| Order information | Art. no. | on request |
|---|---|---|
| Accessory | | Clamp type terminal blocks, Piggy back module Pt-100/Pt-1000 or R100/R1000 Ω, Piggy back module separate galvanic isolated analog input channels 4–20 mA, IDR BLOK programming tool, TI development tools for "C" language programming |

* Connection to the MELSEC AnU/QnA series is only possible via extension base unit A1S52B-S1

## ■ Hand-held Programming Unit A7PU



The hand-held programming unit A7PU is used for the MELSEC A controllers.

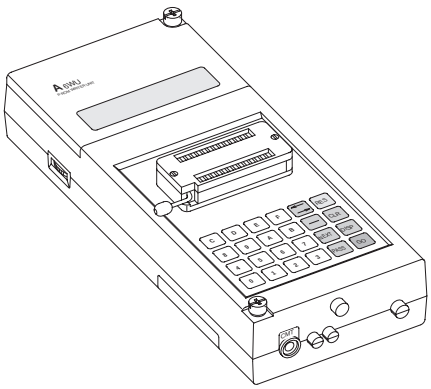
The programming unit can be mounted directly on the controller or connected by a cable.

Programming takes the form of an instruction list.

The unit is suitable for minor program changes directly on the machine.

| Specifications | | A7PU |
|---|---|---|
| General specifications | | Conform to basic components of AnS/QnAS |
| Ambient temperature | | 0 – 40 °C |
| Ambient relative humidity (non-condensing) | | 85 % |
| Power supply | | 5 V DC (from PLC) |
| Current consumption | mA | 300 |
| Display | | LCD |
| Character display | | 16 x 2 |
| Keyboard | | 54 keys |
| Cable, is adjoined | | J1, to connect a standard cassette-player |
| Weight | kg | 0.5 |
| Dimensions (W x H x D) | mm | 188 x 79 x 44.5 |
| **Oder information** | Art. no. | 3922 |

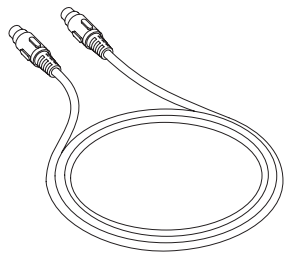
## ■ A6WU EPROM Writer



The EPROM writer A6WU is used for transfering the PLC programs of the MELSEC AnS controller to the EPROM memory cassette. Conversely, existing programs on the memory cassette can be written into the CMOS RAM of the controller and program comparisons can be carried out.

| | | A6WU |
|---|---|---|
| **Order information** | Art. no. | 3921 |

## ■ Connecting Cable

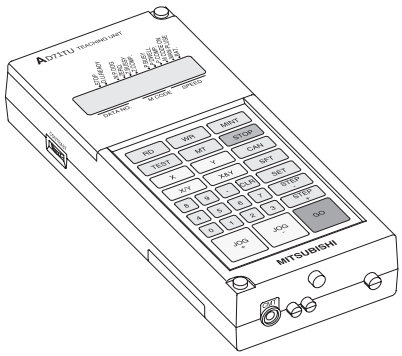


The cables AC30R4 and AC300CR4 are used for connecting the hand-held programming unit to the controller.

The cable AC 30WU is used for connecting the EPROM writer.

| Specifications | | AC 30R4 | AC300CR4 | AC 30WU |
|---|---|---|---|---|
| Connecting device | | A7PU | A7PU | A6WU |
| Length | m | 3 | 30 | 3 |
| **Order information** | Art. no. | 3930 | 3928 | 15033 |

## Teaching Unit AD71TU




The AD71TU teaching unit is used for setting parameters and entering position data for the AD71 and AD72 positioning modules.

Position parameters are read and written via the handy unit's integrated RS422 interface.

This unit is often used for on-site system setup and commissioning.

An additional interface is provided for the connection of a standard cassette recorder for data storage.

| Specifications | | AD71TU |
|---|---|---|
| General specifications | | Conforms to MELSEC A series basic components |
| Ambient temperature | | 0 – 40 °C |
| Storage temperature | | -20 °C – 50 °C |
| Power supply | V | DC 5 (by positioning module) |
| Power consumption | mA | 0.3 |
| Display type | | LCD |
| Display format | | 16 characters x 2 lines |
| Keypad | | Membrane keypad, 30 keys |
| Cassette recorder cable | | J1, for connection of a standard cassette recorder |
| Programming software | | SW0-AD71PE, art. no. 4191 |
| Programming cable | | AC30R4, art. no. 3930 |
| Weight | kg | 0.45 |
| Dimensions (W x H x D) | mm | 79 x 188 x 23 |
| **Order information** | Art. no. | 4193 |

**MITSUBISHI ELECTRIC EUROPE B.V.**
Factory-Automation / German Branch
Gothaer Str. 8
D-40880 Ratingen

Fax: +49 2102 486-112

Company: . . . . . .
Department: . . . . . .
Street: . . . . . .
Address: . . . . . .
Phone: . . . . . .
Fax: . . . . . .

**Order declaration**

| Pos. | Number | Item (type) | Article number | Description | Remarks |
|---|---|---|---|---|---|
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Notes when ordering:
When ordering, please use only the type designations and order numbers shown in this catalogue.

## HEADQUARTERS

MITSUBISHI ELECTRIC EUROPE B.V.
German Branch
Gothaer Straße 8
**D-40880 Ratingen**
Phone: +49 (0) 21 02 / 486-0
Fax: +49 (0) 21 02 / 4 86-1 12
E mail: megfamail@meg.mee.com
**EUROPE**

MITSUBISHI ELECTRIC EUROPE B.V.
ITALIAN BRANCH
Via Paracelso 12
**I-20041 Agrate Brianza (MI)**
Phone: +39 039 6053 1
Fax: +39 039 6053 312
E mail: industrial@it.mee.com
**ITALY**

MITSUBISHI ELECTRIC EUROPE B.V.
SPANISH BRANCH
Calle Joan Buscallá, 2–4
**E-08190 Sant Cugat del Vallés**
Phone: +34 (9) 3 / 565 31 60
Fax: +34 (9) 3 / 589 15 79
E mail: industrial@sp.mee.com
**SPAIN**

MITSUBISHI ELECTRIC EUROPE B.V.
UK Branch
Travellers Lane
**GB-Hatfield Herts. AL10 8 XB**
Phone: +44 (0) 1707 / 27 61 00
Fax: +44 (0) 1707 / 27 86 95
**UK**

MITSUBISHI ELECTRIC CORPORATION
Mitsubishi Denki Bldg.
2-2-3 Marunouchi
**Tokyo 100-8310**
Phone: +81 (0) 3 / 32 18 31 76
Fax: +81 (0) 3 / 32 18 24 22
**JAPAN**

MITSUBISHI ELECTRIC AUTOMATION
500 Corporate Woods Parkway
**Vernon Hills, IL 60061**
Phone: +1 847 / 478 21 00
Fax: +1 847 / 478 22 83
**USA**

## EUROPAN REPRESENTATIVES

GEVA GmbH
Wiener Straße 89
**A-2500 Baden**
Phone: +43 (0) 2252 / 85 55 20
Fax: +43 (0) 2252 / 488 60
E mail: office@geva.co.at
**AUSTRIA**

GETRONICS NV/SA
Pontbeeklaan 43
**B-1731 Zellik**
Phone: +32 (0) 2 / 467 17 51
Fax: +32 (0) 2 / 467 17 45
**BELGIUM**

INEA CR d.o.o.
Drvinje bb
**HR-10000 Zagreb**
Phone: +385 (0) 1 / 366 71 40
Fax: +385 (0) 1 / 366 71 40
**CROATIA**

AUTOCONT s.r.o.
Nemocnicni 12
**CZ-70100 Ostrava 1**
Phone: +420 (0) 69 / 615 21 11
Fax: +420 (0) 69 / 615 21 12
**CZECHIA**

Louis Poulsen
Geminivej 32
**DK-2670 Greve**
Phone: +45 (0) 43 / 95 95 95
Fax: +45 (0) 43 / 95 95 90
E mail: elpefa@elpefa.dk
**DENMARK**

UTU ELEKTROTEHNIKA AS
P.O. Box 4180
**EE-0090 Tallinn**
Phone: +372 6 / 56 31 94
Fax: +372 6 / 56 38 36
E mail: utu@uninet.ee
**ESTONIA**

Beijer Electronics OY
Elannontie 5
**FIN-01510 Vantaa**
Phone: +358 (0) 9 / 615 20 11
Fax: +358 (0) 9 / 615 20 500
E mail: info@elc.beijer.fi
**FINLAND**

IP Systèmes
8, Rue Du Colonel Chambonnet
**F-69672 Lyon Bron Cedex**
Phone: +33 (0) 4 / 72 14 18 00
Fax: +33 (0) 4 / 72 14 18 01
E mail: info@ip-systemes.fr
**FRANCE**

SANDSOFT
5 Röppentyü Köz
**H-1139 Budapest**
Phone: +36 (0) 1 / 375 38 98
Fax: +36 (0) 1/ 3 75 06 88
**HUNGARY**

MITSUBISHI ELECTRIC EUROPE B.V.
Westgate Business Park, Ballymount
**IRL-Dublin 24**
Phone: +353 (0) 1 / 419 88 00
Fax: +353 (0) 1 / 419 88 90
**IRELAND**

CARPANETO & C. S.p.A.
Via Ferrero 10
**I-10090 Cascine Vica-Rivoli (TO)**
Phone: +39 011 / 959 01 11
Fax: +39 011 / 959 02 50
E mail: info.carpaneto@carpaneto.it
**ITALY**

## EUROPAN REPRESENTATIVES

Getronics bv
Industrial Automation
Donauweg 10
**NL-1043 AJ-Amsterdam**
Phone: +31 (0) 20 / 586 15 92
Fax: +31 (0) 20 / 586 19 27
E mail: info.algemeen@getronics.nl
**NETHERLANDS**

Beijer Electronics AS
Teglverksveien 1
**N-3002 Drammen**
Phone: +47 (0) 32 / 24 30 00
Fax: +47 (0) 32 / 84 85 77
E mail: info@elc.beijer.no
**NORWAY**

MPL Technology Sp. z.o.o
ul. Wrocławska 53
**PL-30011 Kraków**
Phone: +48 (0) 12 / 632 28 85
Fax: +48 (0) 12 / 632 47 82
E mail: mpl@krakow.ipl.net
**POLAND**

F. Fonseca Lda
Estrada de Taboeira 87/89, Esgueira
**P-3800 Aveiro**
Phone: +351 (0) 34 / 31 58 00
Fax: +351 (0) 34 / 31 58 04
E mail: amartins@ffonseca.com
**PORTUGAL**

TUINGDOR
20, Fierarilor Street
**RO-72126 Bucaresti**
Phone: +40 (0) 1 / 211 98 01
Fax: +40 (0) 1 / 210 71 81
E mail: tuingdor@pcnet.ro
**ROMANIA**

INEA d.o.o.
Ljubljanska 80
**SI-1230 Domžale**
Phone: +386 (0) 1 / 721 80 00
Fax: +386 (0) 1 / 724 16 72
E mail: zoran.marinsek@inea.si
**SLOVENIA**

Medición y Control, S.A.
Gr. Via d. l. Corts Catalanes 133, 4
**E-08014 Barcelona**
Phone: +34 (9) 3 / 422 77 00
Fax: +34 (9) 3 / 432 28 47
E mail: admin@mecco.org
**SPAIN**

Beijer Electronics AB
Box 325
**S-20123 Malmö**
Phone: +46 (0) 40 / 35 86 00
Fax: +46 (0) 40 / 93 23 01
E mail: info@elc.beijer.se
**SWEDEN**

ECONOTEC AG
Postfach 282
**CH-8309 Nürensdorf**
Phone: +41 (0) 1 / 838 48 11
Fax: +41 (0) 1 / 838 48 12
E mail: info@econotec.ch
**SWITZERLAND**

GTS
Fahri Gizden Sokak,
Hacaloglu Apt. No. 22/6
**TR-80280 Gayrettepe/Istanbul**
Phone: +90 (0) 212 / 267 40 11
Fax: +90 (0) 212 / 266 14 50
E mail: gts@turk.net
**TURKEY**

## MIDDLE EAST REPRESENTATIVES

TEXEL Electronics Ltd.
PO Box 6272
**IL-Netanya 42160**
Phone: +972 (0) 9 / 863 08 94
Fax: +972 (0) 9 / 885 24 30
E mail: texel_me@netvsion.net.il
**ISRAEL**

## EURASIAN REPRESENTATIVE

JV-CSC Automation
Borisoglebskya St. 11
**U-254070 Kiev**
Phone: +380 (4) 4 / 416 42 02
Fax: +380 (4) 4 / 463 63 93
E mail: csc-a@carrier.ki
**UKRAINE**

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