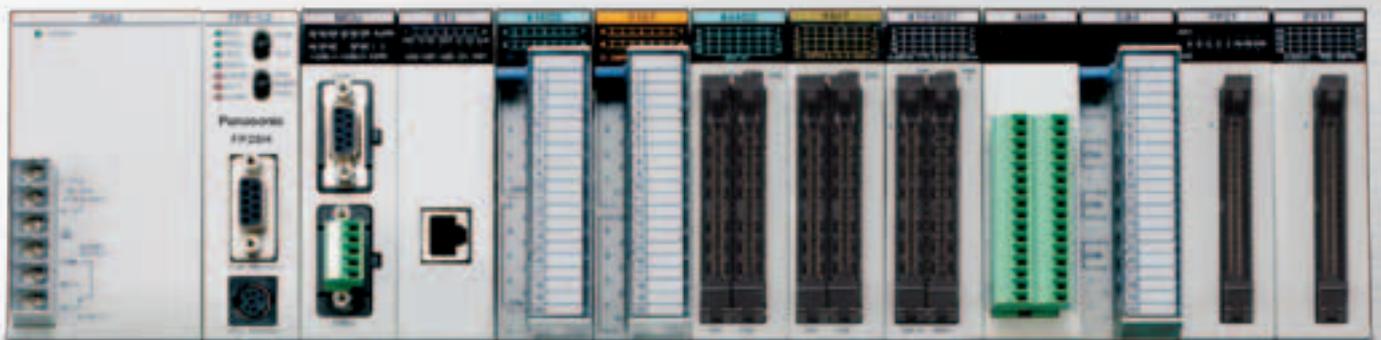


Machine **Cybernation**

High Performance & High Capacity



Compact body loaded with functions equivalent to a medium-scale PLC

Superior cost performance, and ideal for built-in use

FP2SH is a compact PLC series W140 x H100 x D110 mm W5.51 x H3.94 x D4.33 in (when using 5-module type) loaded with multiple functions, achieving superior cost performance.

The CPU units have an RS232C port as standard equipment, which allows for communications with external equipment, such as a computer or a display panel, and advanced communications for remote monitoring and remote maintenance via a modem. Furthermore, the new intelligent units support wider applications, including full-scale "motor (positioning) control", "analog control", and "networking". This series is perfect as built-in controllers for a variety of systems and equipment.

CPU units

Selectable from 4 types, including intelligent types, according to the application

There are 4 types of CPU units, including the standard type and the intelligent type with preinstalled commonly-used advanced functions. This selection allows for more economical system development according to the application.

High-speed operation
processing
Adequate programming
capacity



32 k steps
Standard type
FP2-C2L
(AFP2221)

60 k steps
Standard type
FP2-C2
(AFP2231)

60 k steps
For small PC card
FP2-C2P
(AFP2235)

120 k steps
For small PC card
FP2-C3P
(AFP2255)

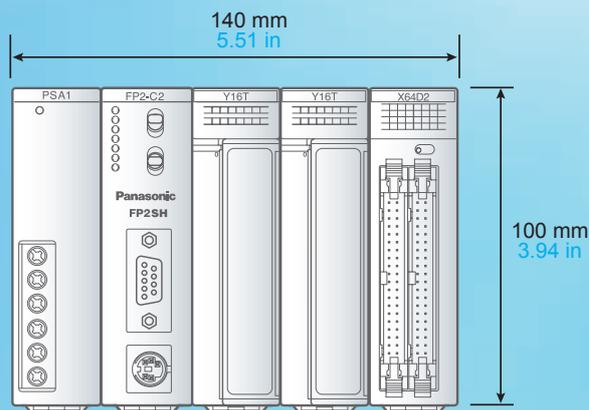
Body size

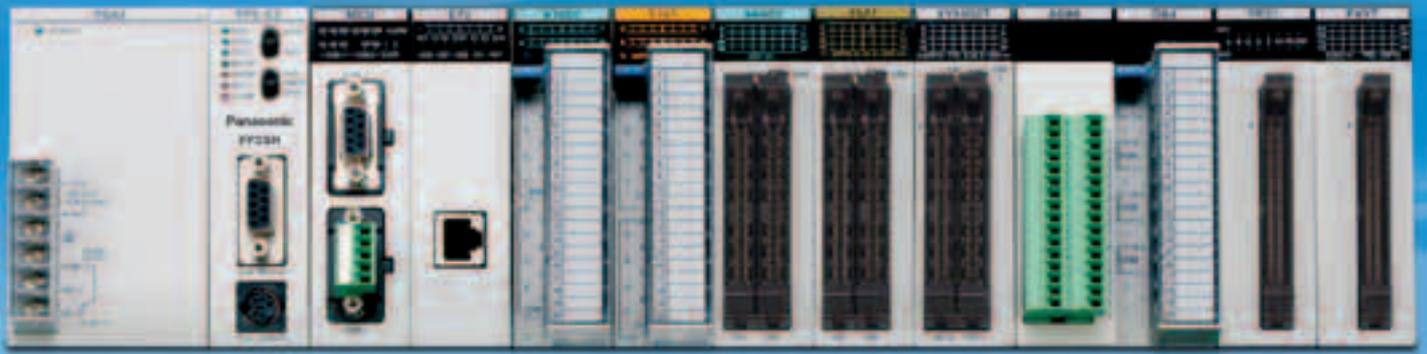
The front face is smaller than an A6 sheet of paper.

The front face area is W140 x H100 mm W5.51 x H3.94 in (when using five modules), which is small enough to fit completely on an A6 sheet of paper.

The compact body requires minimum installation space.

* Depth: 108.3 mm 4.26 in





Programmable Controller **FP2SH**

Memory and I/O control

Equipped with an adequate large capacity program memory and operation memory

The compact size unit can have a large capacity program memory, which can be selected among 32 k, 60 k, and 120 k steps types. A variety of operation memory types are also available.

Also, the maximum controllable I/O points is 2,048 points (8,192 points when using remote I/O system), which is sufficient for medium-scale control.

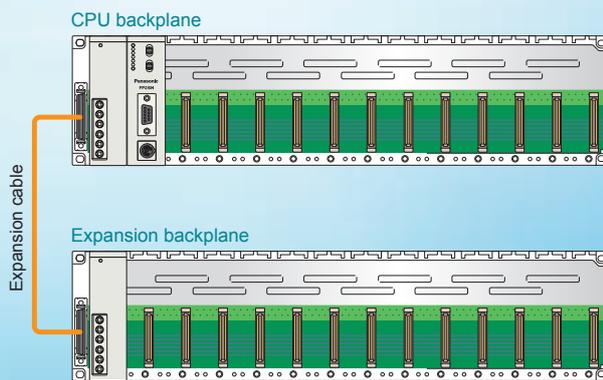
■ Addition of optional memory

An IC memory card can be used in the CPU unit as program memory or expanded data memory.

■ I/O point expansion by adding backplanes

Conventional backplane

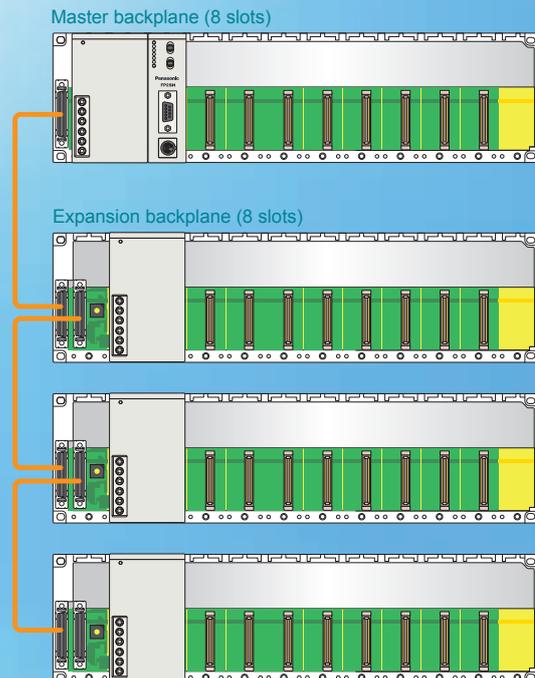
Only one backplane can be added to one master backplane. When both the master and expansion backplanes are of the 14-module type, up to 1,600 I/O points can be controlled.



(The backplane can be used as either a master or expansion backplane.)

H type backplane

Up to three backplanes can be added to one master backplane. A maximum of 32 units can be connected, and up to 2,048 I/O points can be controlled, values surpassing those of the conventional backplane expansion system (25 units/1,600 points).



| | Conventional type | H type |
|---------------------------|----------------------------|---|
| Max. number of backplanes | 1 + 1 = 2 backplanes | 1 for master + 3 for expansion = 4 backplanes |
| Max. number of units | 12 + 13 = 25 units | 8 + 8 x 3 = 32 units |
| Max. number of I/O points | 25 x 64 = 1,600 points | 32 x 64 = 2,048 points |
| Max. cable length | 1 cable, 2 m 6.6 ft | 3 cables, 3.2 m 10.5 ft |

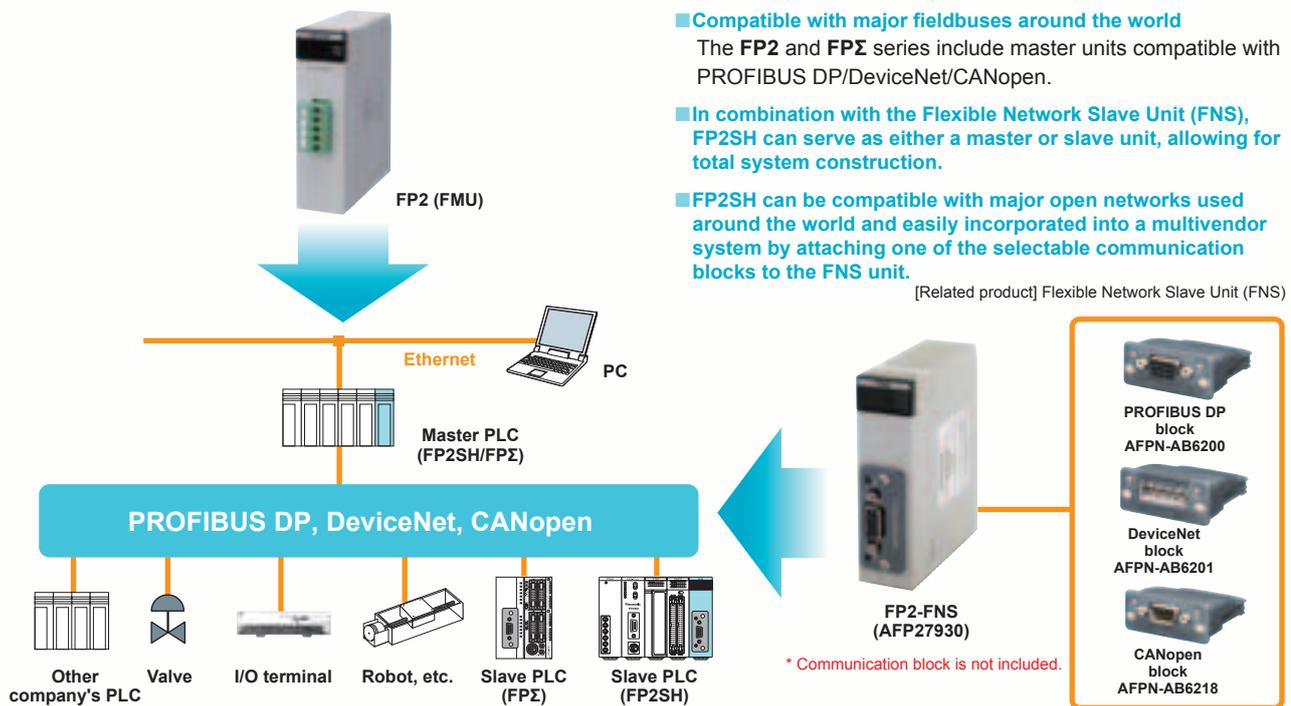
* The H type and conventional type cannot be used in combination.

Network compatibility

Support a wide variety of networks, such as open networks, PLC links, remote I/O systems.

Open networks

PROFIBUS DP, DeviceNet, CANopen



Features

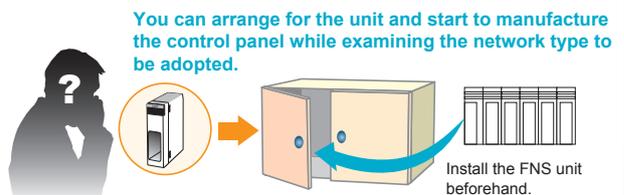
- 1 The FNS unit can be made compatible with three networks by changing the attached communication block without replacing the main unit (FP2-FNS), thereby reducing the stock of maintenance parts.
- 2 Libraries useful for building applications are available (for Control FPWIN Pro). The setup man-hours can be significantly reduced.



Note: Since the above libraries are used for setting up the FNS unit, **Control FPWIN Pro** (Ver. 5.24 or later) is required. **Control FPWIN GR** cannot set up the unit.

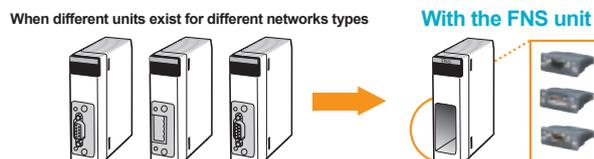
The unit and control panel can be arranged in advance.

When a production line is introduced in an overseas plant for example, it is possible that you have already decided to adopt an open network for line control/management, but have not yet determined which is the optimum network to adopt: PROFIBUS, DeviceNet, or CANopen. Even in such cases, you can install the FNS unit and start manufacturing the panel first, and then choose the communication block to be attached after determining which network should be adopted, shortening the work period.



Maintenance part stocks can be reduced.

When a plant adopts multiple network types, the plant can reduce the stock of maintenance parts by keeping only the FNS unit and communication blocks in stock rather than whole units that are compatible with only one network type.



FL-net

"FL-net is a responsive high-performance network for factory automation based on Ethernet. The Japan Electrical Manufacturers' Association started FL-net certification in April 2000."

FL-net is now rapidly spreading into various fields, including manufacturing, food, medical, packaging, printing industries and public/social systems.

[FL-net function of the VE link unit]

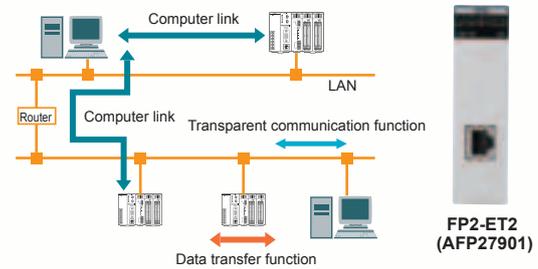
- 1 10 Mbps high-speed link
- 2 Large link area of 8 k points / 8 k words
- 3 Max. 254 nodes (stations)



FP2-VE2
(AFP279601)

Ethernet

- 1 Supports two communications interfaces: 100BASE-TX and 10BASE-T
- 2 Supports TCP/IP and UDP/IP.
- 3 Communications among a maximum of eight connections are available.
- 4 Compatible with user-friendly MEWTOCOL communication.
- 5 Supports remote programming.



FP2-ET2
(AFP27901)

PLC link

The PLC link is a system that allows our PLCs to share contact data and word data without programming.

VE mode

High-speed, large-capacity PLC link using the VE link unit based on Ethernet

- 1 10 Mbps high-speed link
- 2 Large link area of 8,192 points / 8,192 words
- 3 Up to 99 units can be connected.
- 4 Extendable to 2,500 m **8,202 ft**

* When using a repeater



FP2-VE2
(AFP279601)

MEWNET-W0 mode

A PLC link of the compact high-performance PLC **FPΣ** and **FP-X** can be established by using a combination of the multi-communication unit and an RS485 communication block. This mode enables the efficient connection of **FP2SH**, **FPΣ**, and **FP-X** units on a single network and contributes to significant cost reduction.

- 1 115.2 kbps transmission speed
- 2 Transfer of data of 64 points / 128 words is possible.
- 3 Up to 16 units can be connected.
- 4 Extendable to 1,200 m **3,937 ft**



FP2-MCU
(AFP2465)

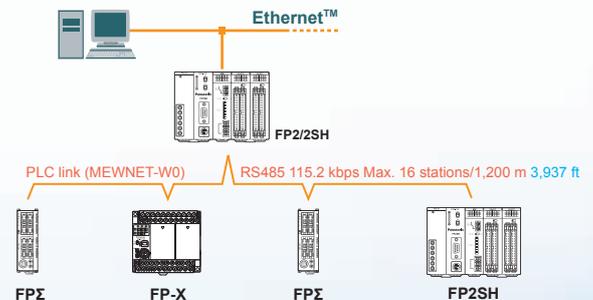
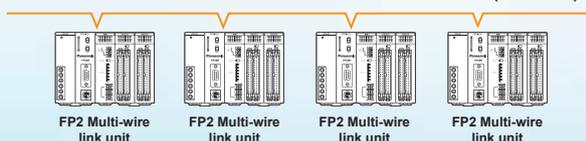
MEWNET-W2 mode

Large capacity PLC links can be established by using twisted-pair cables and multi-wire link units.

- 1 500 kbps transmission speed
- 2 Transfer of data of 4,096 points / 4,096 words is possible.
- 3 Up to 32 units can be connected.
- 4 Extendable to 1,200 m **3,937 ft**



FP2-MW
(AFP2720)



* Each **FPΣ** also requires that an RS485 type **FPΣ** communication cassette (**AFPG803** or **AFPG806**) be attached.

* Each **FP-X** requires that **AFPX-COM3** or **AFPX-COM4** communication cassette be attached.

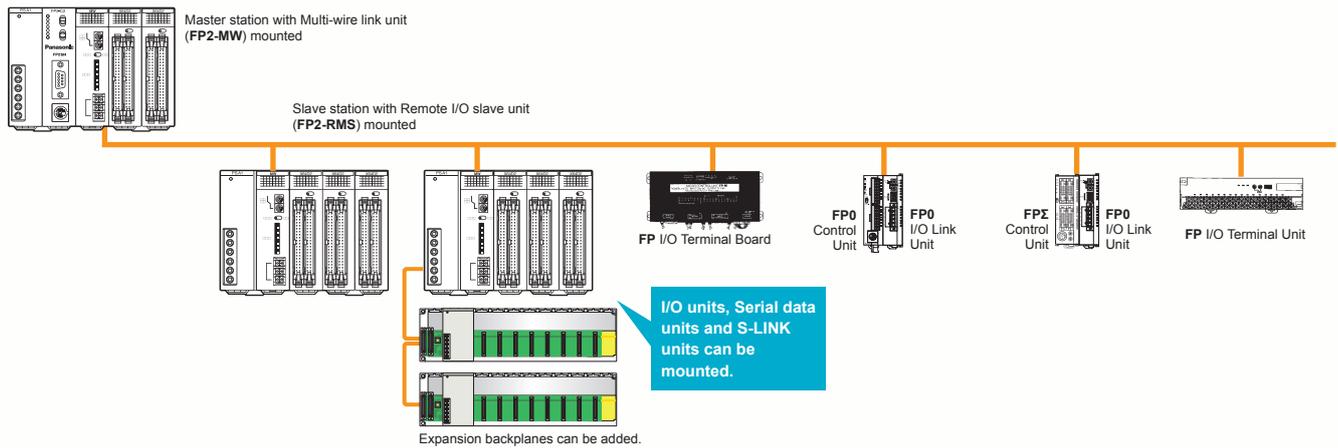
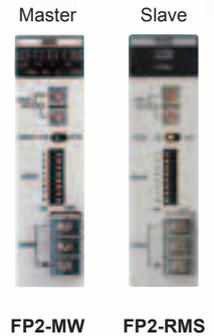
Remote I/O systems

MEWNET-F mode

The use of Multi-wire link units allows for up to 8,192 I/O points, up to 32 stations, and up to a 700 m 2,297 ft transmission distance.

- MEWNET-F is a remote I/O system that connects I/O units in separate locations with 2-wire cable.
- Up to four wiring routes are available, allowing for a complicated layout of slave stations.
- The Multi-wire link unit serves as a master station of remote I/O system. Slave stations can be selectable from the units shown below.
- This network system is ideal for cases where I/O units need to be installed in separate locations or in a location away from the control box.

FP2SH can be used as a remote I/O slave station by attaching the FP2 Remote I/O slave unit on the backplane. On the backplane, I/O units, Serial data units, and S-LINK units can be mounted, allowing for building a multipoint multifunctional slave station.



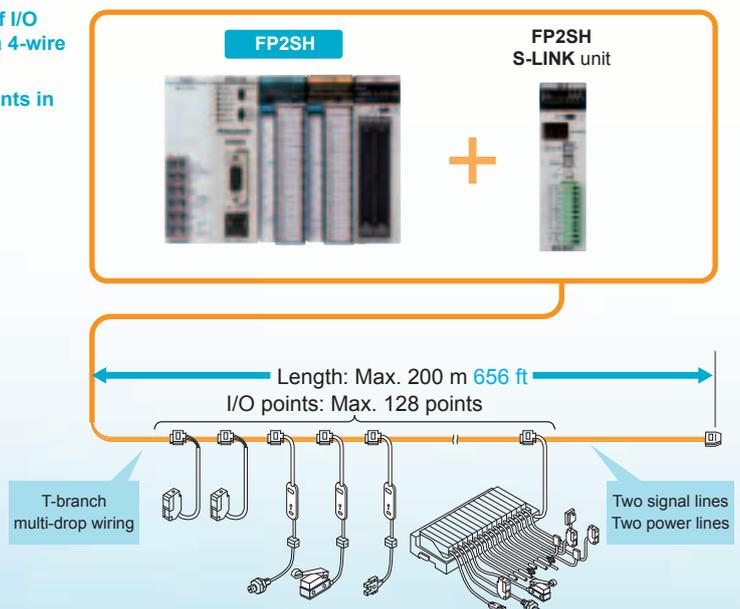
S-LINK

- S-LINK is wire-saving system that allows the free layout of I/O devices, such as sensors, by T-branch connections with a 4-wire flat cable.
- The number of I/O points can be increased up to 2,048 points in increments of one channel having 128 points.
- Sensors to be connected by S-LINK must be chosen from S-LINK-compatible sensors.



S-LINK unit

Note: The number of I/O points may be less than 128 points depending on the connected model and connection location. For details, please refer to the S-LINK manual.



Serial communication control

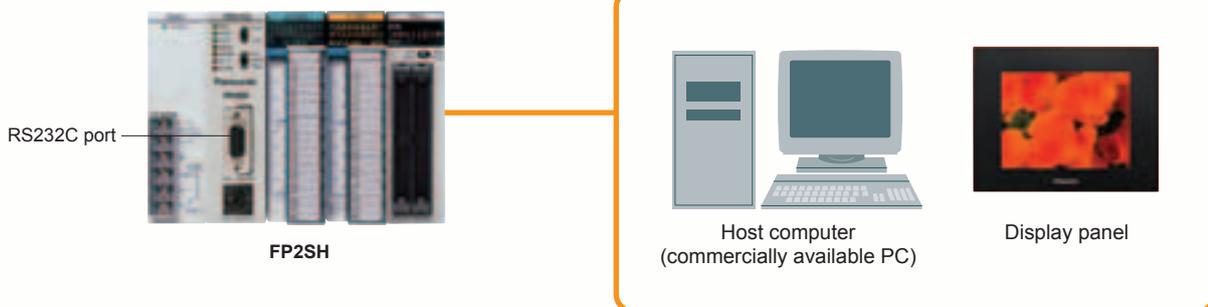
The CPU units have an RS232C port as standard equipment. The communication unit enables connections with RS232C, RS485 and RS422-compatible devices.

■ CPU units

All CPU units have an RS232C port as standard equipment. They can be directly connected to a host computer or a display panel, and can also be connected to a modem to collect data from and change programs in devices in a remote location.



[Direct connection to operation display panel or computer]



■ Multi-Communication Unit (MCU)

The serial communication blocks are detachable.

Up to two blocks to be attached can be selected among RS485, RS232C, and RS422 blocks.



FP2-MCU (AFP2465)

High-speed communication

The 230 kbps communication speed (simultaneous two channels) facilitates fast large-volume data communications.

[Selectable from three communication blocks]

The use of only one channel is also possible.

RS232C



FP2-CB232 (AFP2803)

RS422



FP2-CB422 (AFP2804)

RS485



FP2-CB485 (AFP2805)

The combination is selectable.

COM2 (the lower channel) is sealed before shipping so that it can be protected from damage even when only COM1 is used.



Multi-Communication Unit **FP2-MCU (AFP2465)**

* This unit cannot operate without a communication block attached. Purchase the communication block together with this unit.

Motor control

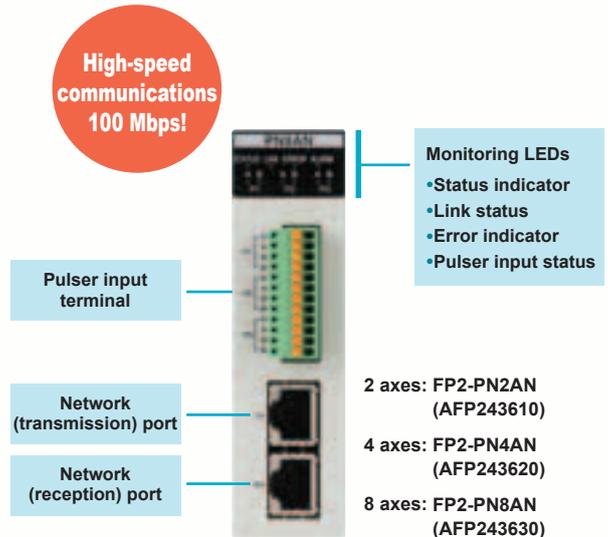
Positioning Unit RTEX

Compatible with Realtime Express MINAS A4N/A5N*1 network servo systems Facilitate multi-axis high precision positioning (A5N is supported from Ver. 1.3.)

- High-accuracy multi-axis positioning control achieved by high-speed 100 Mbps communications
- Compatible with commercially-available LAN cables, significantly reducing wiring costs
- 2 axes type available in addition to the 4 axes and 8 axes types
- Position data up to 600 points can be registered for each axis.
- Three axes spiral interpolation supported in addition to two axes linear and two axes circular interpolation
- Dedicated tool software Configurator PM supports operations from setup through startup and monitoring.
- Equipped with a manual pulser input, allowing for fine teaching

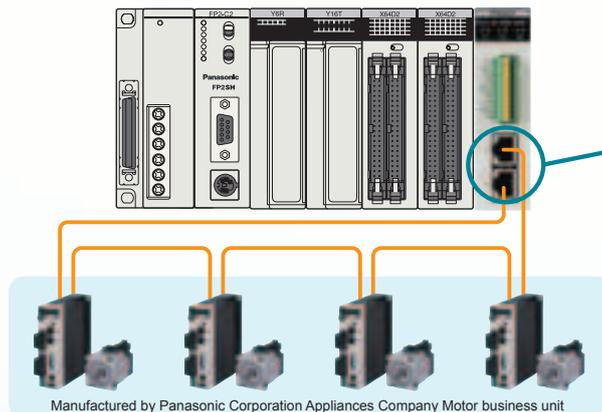
*1 Realtime Express and MINAS A4N/A5N are a trademark and a product name of Panasonic Corporation Appliances Company Motor business unit. Mixed use of MINAS A4N and A5N is not possible.

High-speed communications 100 Mbps!



Compatible with commercially-available LAN cables, providing overwhelming advantages in economy and availability

Realtime Express*1 has adopted a commercially-available LAN cable as its network cable, providing overwhelming advantages in economy, availability, and workability for your wiring work.



Commercially-available LAN cable

Ethernet category 5e
Shielded type (straight)

New function added

- ① Positioning repeat function Effective for wire winding machines, grinding machines, and other equipment that repeats the same operation.
- ② Home return methods added Eight methods that help the simplification of equipment, including limit-stop and contact-stop methods, were added.
- ③ Synchronized operation Two sets consisting of one master axis and one slave axis can be designated. Ideal for dual-axis table transfer.
- ④ Real-time torque limiting The torque limit value can be changed any time during operation. Ideal for axis push-in control.
- ⑤ JOG operation positioning control The operation slows to a stop at a fixed position according to a sensor input. Ideal for labelers.
- ⑥ Auxiliary contact (Delay mode) The auxiliary contact output is possible any time during positioning.
- ⑦ Current value changing function The value of current position can be changed to any value. Usable for zero offset.
- ⑧ Operation during the system startup changed The unit startup was made possible even if the servo amplifier's main power is not turned on.

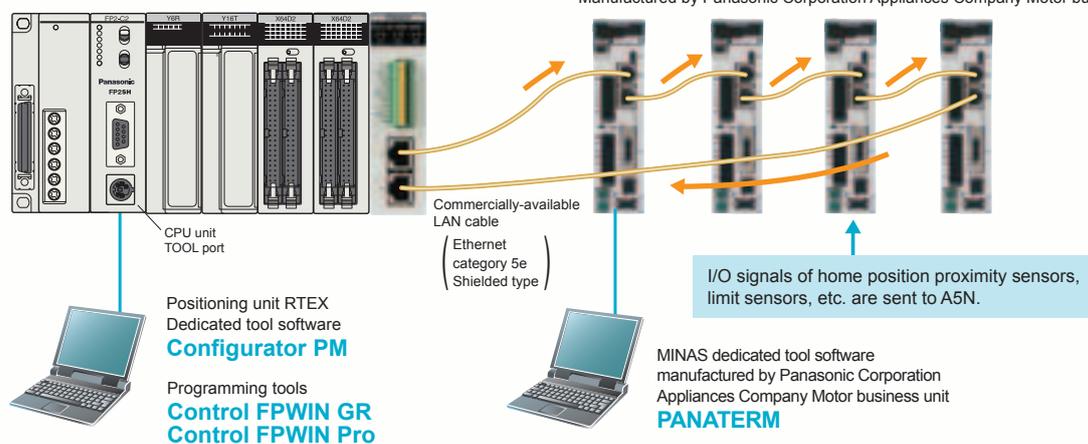
Controls up to 256 axes, adequately supporting large-scale equipment control

- Up to 8 axes type 32 units can be connected, and up to 256 axes can be controlled. (when using H type backplane).
- Selectable among 2, 4, and 8 axes types to flexibly support system configurations of a few or multiple axes
- Use in combination with the ultra-high speed and large capacity CPU unit [20 k steps/1 ms (measured by our company), program capacity of 120 k steps] adequately supports the control of large-scale equipment.

System configuration

[Maximum number of connectable Positioning Unit RTEX: 32 units] [One Positioning Unit can control two to eight axes (depending on the type).]

* Servo amplifier MINAS A5N
Manufactured by Panasonic Corporation Appliances Company Motor business unit



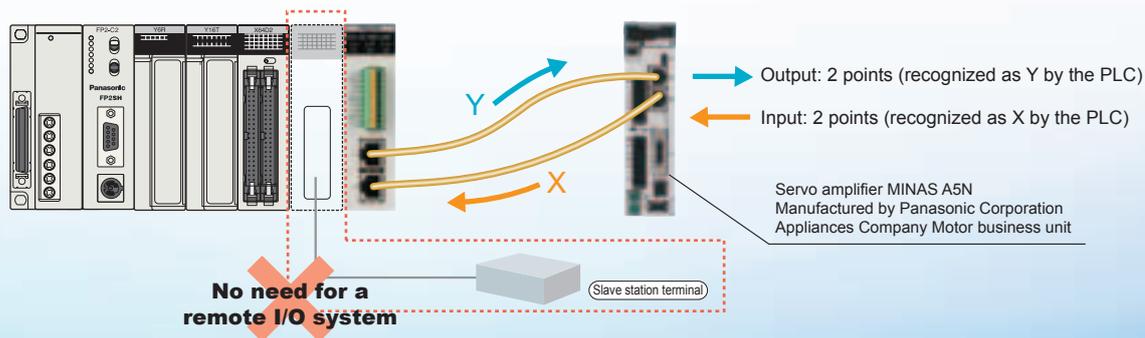
Dedicated setting tool software Configurator PM

Reliable and user-friendly software tool for the process from setting through startup and operation monitoring for the functions, including specification of axes to be used, parameter setting, data table creation, JOG operation, home return, and data monitoring.



The use of the servo amplifier with four built-in general-purpose I/O points eliminates the need for a remote I/O terminal.

The servo amplifier has two DC inputs and two DC outputs, which serve as X and Y respectively for the PLC via a network. Signal inputs from various sensors and lamp-lighting outputs for a local control axis can be controlled by a PLC, eliminating the costs required for adding a remote I/O system for such control.



Positioning Unit (Multi function type)

High-speed, high-accuracy pulse output type positioning unit Speed command: 4 Mpps, Startup time: 0.005 ms

Support pulse-input type stepping motors, and servomotors.
The speed command range is up to 4 Mpps, allowing for high-speed and high-accuracy positioning.
The startup time is as high as 0.005 ms, allowing for a reduction of the tact time.
(Startup time: Time between reception of a command from a CPU unit and pulse output from a positioning unit)

- **Feedback pulse count function** Counts output pulses from encoders or other devices
- **The jog positioning control widens the supported application range.**
- **The four types of S-curve acceleration/deceleration control allow for smooth startup and stoppage.**
- **Program libraries for linear interpolation and other operations are available.**

"Function Libraries for FPCWIN Pro" can be downloaded from our website:

<http://panasonic.net/id/pidsx/global>

- **Motor Driver I/F Terminal II is available for connection with MINAS series AC servomotors.**



For 1 axis (AFP8503)



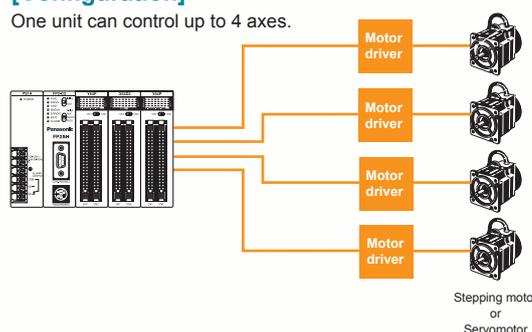
For 2 axes (AFP8504)



| | Positioning Unit (2 axes) | Positioning Unit (4 axes) |
|-------------|---------------------------|---------------------------|
| Line driver | FP2-PP22 (AFP2434) | FP2-PP42 (AFP2435) |
| Transistor | FP2-PP21 (AFP2432) | FP2-PP41 (AFP2433) |

[Configuration]

One unit can control up to 4 axes.



Positioning Unit (Interpolation type)

Compatible with synchronized operation and interpolation control, easily building systems for applications, such as the parallel translation of transfer tables, cutting, X-Y table control, palletizing, and winding machine



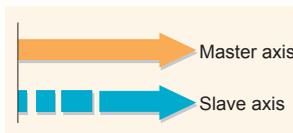
| | Positioning Unit (2 axes) | Positioning Unit (4 axes) |
|-------------|---------------------------|---------------------------|
| Line driver | FP2-PP2L (AFP243711) | FP2-PP4L (AFP243721) |
| Transistor | FP2-PP2T (AFP243710) | FP2-PP4T (AFP243720) |

■ Dedicated setting tool software Configurator PM

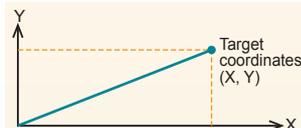
Reliable and user-friendly software tool for the process from setting through startup and operation monitoring for the functions, including specification of axes to be used, parameter setting, data table creation, JOG operation, home return, and data monitoring.



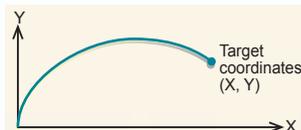
[Two axes synchronization operation]



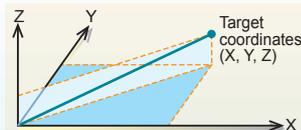
[Two axes linear interpolation]



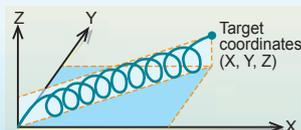
[Two axes circular interpolation]



[Three axes linear interpolation]



[Three axes spiral interpolation]

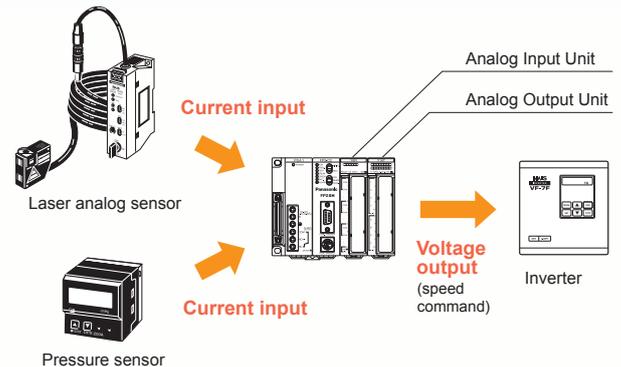


Analog control

Multi-range control of a variety of equipment is possible. The unit can be directly connected with thermocouples and Resistance Temperature Detectors (R.T.D.).

- **Support voltage/current/temperature sensor ranges.**
 The analog input supports voltage, current, and temperature sensors. The analog output supports voltage or current. Different voltage/current ranges can be controlled concurrently
- **Equipped with multiple channels**
 The input unit has 8 channels, and the output unit has 4 channels. Space-saving and multiple-channel control is possible.
- **High-speed conversion at 500 μ s by each channel**
 The conversion speed of voltage and current input/output can reach as high as 500 μ s.
- **I/O refresh system**
 Since input/output data is allocated to the I/O memory, complicated programming is not necessary.

[Configuration]



Analog input types

Three types of analog input units are available to meet a wide variety of customer needs.

High-speed, high-accuracy, multiple-input type with isolated channels

- High speed**
 Highly reliable isolation among channels
Temperature conversion: 20 ms/ch
Voltage conversion: 5 ms/ch
 (Without insulation setting: 500 μ s/ch)
- High accuracy**
 High accuracy conversion
Voltage: ± 0.1 % (25 °C 77 °F)
Temperature: ± 0.3 % (0 to 55 °C 32 to 131 °F)
- Multiple inputs**
 A single unit supports inputs of thermocouple, R.T.D., and voltage *1



FP2-AD8X (AFP2401)

- For users who require faster and more accurate temperature control
- For users who require multiple with isolated channels or who want to reduce the cost per one channel
- For users who want to input temperature and voltage (current) data through a single unit

*1 Current inputs can be converted into voltage inputs by attaching the supplied external resistor to the input terminal section.

Input unit solely for R.T.D. (Pt100 / Pt1000)

- High-speed and high accuracy**
Conversion speed: 20 ms/ch
Conversion accuracy: ± 0.3 % (0 to 55 °C 32 to 131 °F)

- For users who R.T.D. input only and require more affordable type



FP2-RTD (AFP2402)

Low cost input solely for voltage/current data

- Low cost type for input of voltage/current data that indicates measurements of pressure, flow rate, fluid volume, speed, etc.



FP2-AD8VI (AFP2400L)

Analog output type

Supports multiple channels. (4 channels per one unit)



- Conversion speed: 500 μ s/ch**
Over accuracy: ± 1.0 %F.S. or less
 (0 to 55 °C 32 to 131 °F)



FP2-DA4 (AFP2410)

FP2SH

Scanning time of 1 ms for 20 k steps. A high-performance model for high-speed operation.



Operation speed:
30 ns

Maximum I/O points:
2,048 points

Program capacity:
Max. 120 k steps

Open network
PROFIBUS Modbus-RTU
DeviceNet CC-Link
CANopen Ethernet

Positioning:
network servo,
Max. 256 axes

Positioning:
pulse output 4 Mpps,
start up: 0.005 ms



Features

1. Scanning time of 1 ms for 20 k steps

The program of 20 k steps can be executed in 1 ms. The result is a dramatically decreased tact time and high-speed device.

2. Large programming capacity: Maximum 120 k steps

Both the large programming capacities of 32 k, 60 k and 120 k are available depending on the model.

3. Optional small PC card is also available.

The small PC card is available for programming backup or data memory expansion. This allows data processing of great amounts of data.

4. Built-in comment and calendar timer functions.

These functions, options with the FP2, are built right into the FP2SH.

* The I/O units and intelligent units are the same for the FP2 series.

Power supply and I/O specifications

| Item | Specifications |
|--------------|--|
| Power supply | 100 to 120 V AC, 200 to 240 V AC, 100 to 240 V AC, 24 V DC (varies with different units) |
| Input | 12 to 24 V DC, 24 V DC ± common |
| Output | Relay output: 2 to 5 A, Transistor output: 0.1 to 0.5 A (varies with different units) |

Supported functions

| Item | Specifications |
|----------------------|---|
| Analog I/O | Available by adding Analog input and Analog output units. |
| High-speed counter | Available by adding High-speed counter unit. (Max. 200 kHz) |
| Positioning | Available by adding Positioning unit. (Max. 4 Mpps) * The RTEX-compatible positioning unit is also available. |
| Serial communication | RS232C port Standard equipped with CPU unit. Expandable by adding Computer communication unit (CCU), Serial data unit and Multi-communication unit (MCU) |
| | RS422 RS485 Expandable by adding Multi-communication unit (MCU) |
| Interrupt input | Available by adding High-speed counter unit or Pulse I/O unit. |

Performance specifications

| Item | Specifications |
|-----------------------------------|---|
| Number of controllable I/O points | Up to 768 points per one board |
| Expansion | Standard Up to one backplane, Max. 25 units I/O points: Max. 1,600 points Remote I/O points: Max. 8,192 points |
| | H type Up to three backplanes, Max. 32 units I/O points: Max. 2,048 points Remote I/O points: Max. 8,192 points |
| Operation speed | 0.03 μs / step (for basic instruction) |
| Built-in memory | RAM (ROM / small PC card is optional) |
| Memory capacity | 32 k steps approx. / 60 k steps approx. / 120 k steps approx. (varies with different units) |
| Operation memory | Internal relay 14,192 points |
| | Timer / Counter 3,072 points in total |
| | Data register 10,240 words |
| | File register 32,765 words × 3 (60 k / 120 k steps) 32,765 words (32 k steps) |

Supported networks

| Item | Specifications |
|------------------|---|
| Open network | Ethernet FL-NET PROFIBUS DeviceNet CANopen |
| Remote I/O | S-LINK, S-LINK V or MEWNET-F |
| PLC link | MEWNET-W2 (Wire), MEWNET-WO, MEWNET-VE or FL-NET |
| Computer link | Linkable by using tool port or COM. port on CPU unit. Also available by adding Multi-communication unit (MCU) and Computer communication unit (CCU) |
| Modem connection | Available |

Other built-in functions

| Item | Specifications |
|----------------------------|----------------|
| Program edition during RUN | Available |
| Constant scan | Available |
| Calendar timer | Built-in type |

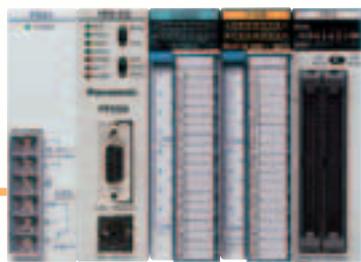
List of Related Part No. Programmable Display GT series

| Product name | Description | | | | | Part No. | | |
|----------------------|---|--------------|---|----------------------|---------------------|-----------------|---------------|------------|
| | LCD | Power supply | Communication port | Color of front panel | SD memory card slot | | | |
| Tough GT32M-E | TFT monochrome LCD | 24 V DC | RS232C | Silver | Available | AIG32MQ03DE | | |
| | | | RS422 / RS485 | | | AIG32MQ05DE | | |
| Tough GT32T-E | TFT color LCD | 24 V DC | RS232C | Silver | Available | AIG32TQ03DE | | |
| | | | RS422 / RS485 | | | AIG32TQ05DE | | |
| GT02L | STN monochrome LCD (white backlight) | 5 V DC | RS232C | Black | Not available | AIG02LQ02D | | |
| | | | RS422 / RS485 | | | AIG02LQ04D | | |
| GT02M | STN monochrome LCD (white/pink/red backlight) | 5 V DC | RS232C | Pure black | Not available | AIG02MQ02D | | |
| | | | | Hairline silver | | AIG02MQ03D | | |
| | | | RS422 / RS485 | Pure black | | AIG02MQ04D | | |
| | | | | Hairline silver | | AIG02MQ05D | | |
| | | 24 V DC | RS232C | Pure black | Not available | AIG02MQ12D | | |
| | | | | Hairline silver | | AIG02MQ13D | | |
| | | | RS422 / RS485 | Pure black | | AIG02MQ14D | | |
| | | | | Hairline silver | | AIG02MQ15D | | |
| | | 24 V DC | RS232C | Pure black | Available | AIG02MQ22D | | |
| | | | | Hairline silver | | AIG02MQ23D | | |
| | | | RS422 / RS485 | Pure black | | AIG02MQ24D | | |
| | | | | Hairline silver | | AIG02MQ25D | | |
| GT02G | STN monochrome LCD (green/orange/red backlight) | 5 V DC | RS232C | Pure black | Not available | AIG02GQ02D | | |
| | | | | Hairline silver | | AIG02GQ03D | | |
| | | | RS422 / RS485 | Pure black | | AIG02GQ04D | | |
| | | | | Hairline silver | | AIG02GQ05D | | |
| | | 24 V DC | RS232C | Pure black | Not available | AIG02GQ12D | | |
| | | | | Hairline silver | | AIG02GQ13D | | |
| | | | RS422 / RS485 | Pure black | | AIG02GQ14D | | |
| | | | | Hairline silver | | AIG02GQ15D | | |
| | | 24 V DC | RS232C | Pure black | Available | AIG02GQ22D | | |
| | | | | Hairline silver | | AIG02GQ23D | | |
| | | | RS422 / RS485 | Pure black | | AIG02GQ24D | | |
| | | | | Hairline silver | | AIG02GQ25D | | |
| GT05M | STN monochrome LCD (white/pink/red backlight) | 24 V DC | RS232C | Pure black | Available | AIG05MQ02D | | |
| | | | RS422 / RS485 | Hairline silver | Available | AIG05MQ03D | | |
| GT05G | STN monochrome LCD (green/orange/red backlight) | 24 V DC | RS232C | Pure black | Available | AIG05GQ02D | | |
| | | | RS422 / RS485 | Hairline silver | Available | AIG05GQ03D | | |
| GT05S | STN color LCD | 24 V DC | RS232C | Pure black | Available | AIG05SQ02D | | |
| | | | RS422 / RS485 | Hairline silver | Available | AIG05SQ03D | | |
| GT12M | STN monochrome LCD (white/pink/red backlight) | 24 V DC | RS232C | Pure black | Not available | AIG12MQ02D | | |
| | | | | Hairline silver | | AIG12MQ03D | | |
| | | | RS422 / RS485 | Pure black | Not available | AIG12MQ04D | | |
| | | | | Hairline silver | | AIG12MQ05D | | |
| | | 24 V DC | RS232C | Pure black | Available | AIG12MQ12D | | |
| | | | | Hairline silver | | AIG12MQ13D | | |
| | | | RS422 / RS485 | Pure black | | Available | AIG12MQ14D | |
| | | | | Hairline silver | | | AIG12MQ15D | |
| | | GT12G | STN monochrome LCD (green/orange/red backlight) | 24 V DC | RS232C | Pure black | Not available | AIG12GQ02D |
| | | | | | | Hairline silver | | AIG12GQ03D |
| | | | | | RS422 / RS485 | Pure black | Not available | AIG12GQ04D |
| | | | | | | Hairline silver | | AIG12GQ05D |
| 24 V DC | RS232C | | | Pure black | Available | AIG12GQ12D | | |
| | | | | Hairline silver | | AIG12GQ13D | | |
| | RS422 / RS485 | | | Pure black | | Available | AIG12GQ14D | |
| | | | | Hairline silver | | | AIG12GQ15D | |
| GT32M | STN monochrome LCD | 24 V DC | RS232C | Pure black | Available | AIG32MQ02D | | |
| | | | RS422 / RS485 | Hairline silver | Available | AIG32MQ03D | | |
| | | 24 V DC | RS232C | Pure black | Available | AIG32MQ04D | | |
| | | | RS422 / RS485 | Hairline silver | | AIG32MQ05D | | |
| GT32T0 | TFT color LCD | 24 V DC | RS232C | Pure black | Available | AIG32TQ02D | | |
| | | | RS422 / RS485 | Hairline silver | Available | AIG32TQ03D | | |
| GT32T1 | TFT color LCD | 24 V DC | RS232C | Pure black | Available | AIG32TQ12D | | |
| | | | RS422 / RS485 | Hairline silver | | Available | AIG32TQ13D | |
| | | 24 V DC | RS232C | Pure black | Available | AIG32TQ14D | | |
| | | | RS422 / RS485 | Hairline silver | | AIG32TQ15D | | |

FP2SH System Configurations and Unit Lineup

Unit combinations

- Each unit is counted in the number of modules occupied. Most of the units occupy one module each. Some units occupy two modules each.
- Each unit is mounted on a backplane chosen depending on the total number of modules occupied by the all units used. The power supply unit and CPU unit must be mounted on the CPU backplane.
- Only one backplane other than the 5-module type can be added by using an expansion cable. Also, the 5-module type can not be used with expansion backplane. A power supply unit must be mounted on the expansion backplane.
- If the backplane is of the H type, up to three backplanes can be added.
- Most of the units can be used in any combination; however, some combinations are subject to constraints due to the unit type, current consumption, and other factors besides the above requirements. Please contact us for details.



FP2SH Power supply units



100 V AC
2.5 A type
AFP2631
(FP2-PSA1)



200 V AC
2.5 A type
AFP2632
(FP2-PSA2)



100 to 240 V AC
5 A type
AFP2633
(FP2-PSA3)



24 V DC
5 A type
AFP2634
(FP2-PSD2)

FP2SH Conventional type and H type backplanes

(For use with both master and expansion backplanes. Only the 5-module type can not be used with expansion backplane.)



5-module type
AFP25005 (FP2-BP05)



7-module type
AFP25007 (FP2-BP07)



9-module type
AFP25009 (FP2-BP09)



12-module type
AFP25012 (FP2-BP12)



14-module type
AFP25014 (FP2-BP14)



H type master backplanes
(11 modules): 8 slots
AFP25011MH (FP2-BP11MH)



H type expansion backplanes
(10 modules): 8 slots
AFP25010EH (FP2-BP10EH)

■ **Units that occupy two modules**
There is a two-module type in the power supply units.

| Type | Product No. |
|-----------------------------|-----------------|
| Power supply unit, 5 A type | FP2-PSA3 |
| | FP2-PSD2 |

FP2SH CPU units



32 k steps
Standard type
AFP2221
(FP2-C2L)



60 k steps
Standard type
AFP2231
(FP2-C2)



60 k steps
For small PC card
AFP2235
(FP2-C2P)



120 k steps
For small PC card
AFP2255
(FP2-C3P)



Expansion cable
(60 cm 2.0 ft)
AFP2510
(FP2-EC)



Expansion cable
(2 m 6.6 ft)
AFP2512
(FP2-EC2)



Dummy unit
AFP2300
(FP2-DM)

FP2SH I/O units, Positioning units and Network-related units

I/O units



16 points DC input
AFP23023 (FP2-X16D2)
16 points NPN transistor output
AFP23403 (FP2-Y16T)
16 points PNP transistor output
AFP23503 (FP2-Y16P)
6 points Relay output
AFP23101 (FP2-Y6R)
16 points Relay output
AFP23103 (FP2-Y16R)



32 points DC input
AFP23064 (FP2-X32D2)
32 points NPN transistor output
AFP23404 (FP2-Y32T)
32 points PNP transistor output
AFP23504 (FP2-Y32P)



64 points DC input
AFP23067 (FP2-X64D2)
64 points NPN transistor output
AFP23407 (FP2-Y64T)
64 points PNP transistor output
AFP23507 (FP2-Y64P)
32 points input / 32 points NPN output mixed
AFP23467 (FP2-XY64D2T)
AFP23477 (FP2-XY64D7T)
32 points input / 32 points PNP output mixed
AFP23567 (FP2-XY64D2P)
AFP23577 (FP2-XY64D7P)

Analog I/O units



Voltage / Current input
AFP2400L
(FP2-AD8VI)



Multiple analog input
AFP2401
(FP2-AD8X)



R.T.D. input
AFP2402
(FP2-RTD)



Analog output
AFP2410
(FP2-DA4)

Positioning units RTEX



(2 axes) **AFP243610**
(FP2-PN2AN)
(4 axes) **AFP243620**
(FP2-PN4AN)
(8 axes) **AFP243630**
(FP2-PN8AN)

Positioning units interpolation type



(2 axes) **AFP243710**
(FP2-PP2T)
AFP243711
(FP2-PP2L)
(4 axes) **AFP243720**
(FP2-PP4T)
AFP243721
(FP2-PP4L)

Positioning units



(2 axes)
AFP2432 (FP2-PP21) **AFP2434** (FP2-PP22)



(4 axes)
AFP2433 (FP2-PP41) **AFP2435** (FP2-PP42)

Pulse I/O units



High-speed counter
AFP2441 (FP2-HSCT) **AFP2451** (FP2-HSCP)



Pulse I/O
AFP2442 (FP2-PXYT) **AFP2452** (FP2-PXYP)

Multi-communication unit



Multi-communication
AFP2465 (FP2-MCU)
* The communication blocks are available separately.

Compatible with open network FP2 FNS unit



AFP27930 (FP2-FNS)
* Communication block is not included.

- PROFIBUS DP block **AFPN-AB6200**
- DeviceNet block **AFPN-AB6201**
- CANopen block **AFPN-AB6218**

Compatible with open network FP2 FMU units



AFP27972

Link-related units



Multi-wire link
AFP2720 (FP2-MW)



Remote I/O slave unit
AFP2745 (FP2-RMS)

Link-related units



VE2-LINK
AFP279601 (FP2-VE2)



ET-LAN2
AFP27901 (FP2-ET2)



S-LINK
AFP2780 (FP2-SL2)



S-LINK V
SL-VFP2

FP2SH
AC servomotor
MINAS Series



* Panasonic Corporation
Appliances Company
Motor business unit

FP2SH
Motor driver I/F
terminal II



1-axis type **AFP8503**



2-axis type **AFP8504**

FP2SH Optional memories

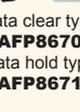
FP memory loader



Expansion memory unit
AFP2208



Data clear type
AFP8670



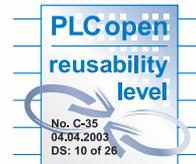
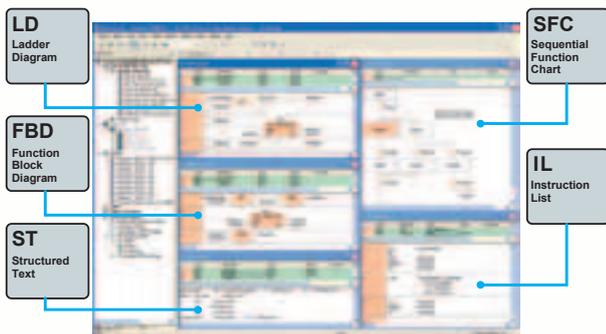
Data hold type
AFP8671

IC memory card (2 MB)
AFP2209

Programming

Control FPCWIN Pro (IEC61131-3 compliant Windows version software)

Compliant with international standard IEC61131-3 -- Programming software approved by PLCopen



Five programming languages can be used.

Programming can be done using the language most familiar to the developer or using the language most suited to the process to be performed. High-level (structured text) languages that allow structuring, such as C, are supported.

Easy to reuse well-proven programs

Efficiency when writing programs has been greatly increased by being able to split programming up for each function and process using structured programming.

Keep know-how from getting out

By "black boxing" a part of a program, you can prevent know-how from leaking out and improve the program's maintainability.

Source program from PLC can be uploaded.

Serviceability is improved by being able to read programs and comments from a PLC. Programming for all models in the FP series possible.

* This only applies to FP-X, FPZ, FP2 (with comment memory), FP2SH and FP10SH (with card board).

Programming for all models in the FP series possible.

Any model can be used.

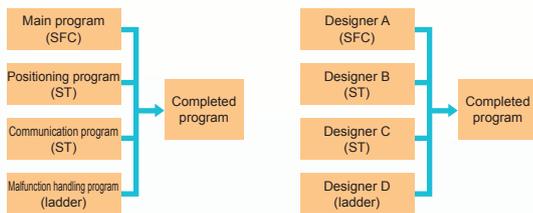
[Programming in the most suitable language]

Programming in the language most suited to the process

Easy-to-understand, efficient programs can be created, for example, by using a ladder program for machine control or ST for communications control.

Programming in the language you are good at

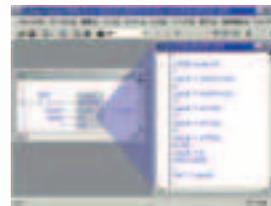
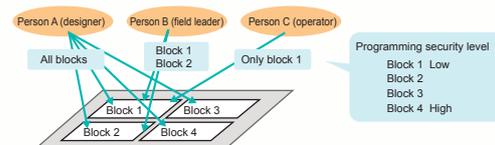
Programming time can be greatly reduced by the easy ability to split and then integrate programming for each function and process.



["Black boxing" of programs]

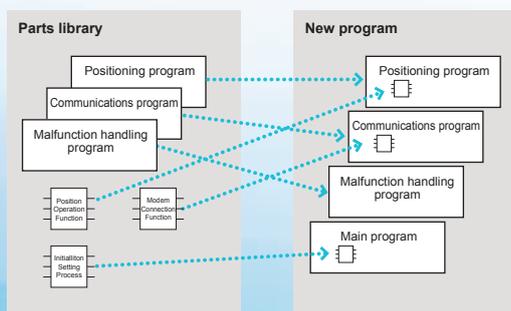
Multiple passwords for protection of each block

The security level (8 levels) can be input for each block in a program. Only users of a set security level or higher can make changes.



[Reuse of programs is easy.]

Register well-proven programs by block in the library. By using variable identifiers (names), there is no need to be concerned with addresses for each model when reusing programs.



[Operational environment]

| | |
|--------------------|--|
| OS | Windows 2000 / XP / Vista / 7*1 |
| Hard disk capacity | At least 120 MB |
| CPU | Pentium III 700 MHz or higher |
| Onboard memory | At least 256 MB (depends on OS) |
| Screen resolution | At least 1,024 × 768 |
| Display colors | High Color (16-bit) or higher |
| Applicable PLC | FPZ / FP-X / FP-e / FP0 / FP0R / FP1 / FP-M / FP2 / FP2SH / FP3 / FP10SH |

Note: Production of FP1, FP-M, FP3, and FP10SH was discontinued in August 2006, and they are no longer sold.

*1 Windows 7 is supported from Ver. 6.2.

■ Control FPWIN GR (for Windows version software)

The ladder programming software for FP series -- highly operational software tool for maximizing convenience in the field

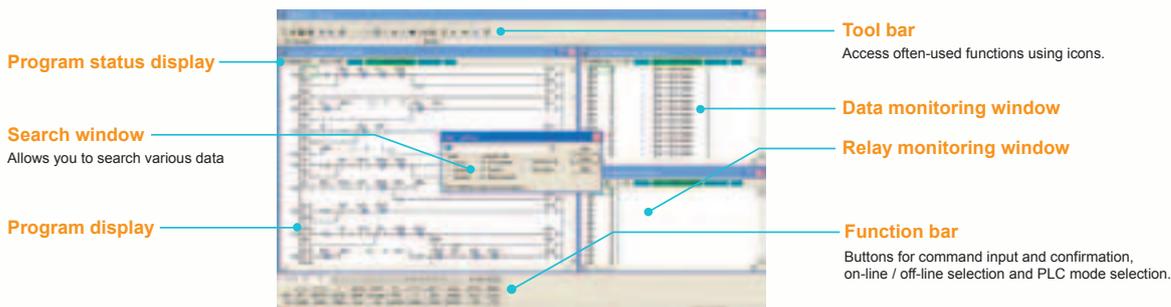
- Easy field operations not requiring the use of a mouse for data entry, search, writing, monitoring and timer changes, all carried out only from the keyboard.
- All FP series PLCs are supported. The software assets produced by using Ver. 4 or Ver. 3 of NPST-GR are usable.
- Easy programming with wizard functions.
- Communication with GTWIN, PCWAY simultaneously through the same port.
- A simulation function is available.

[Operational environment]

| | |
|--------------------|--|
| OS | Windows 98 / Me / 2000 / XP / Vista / 7*1 |
| Hard disk capacity | At least 40 MB |
| CPU | Pentium 100 MHz or higher |
| Onboard memory | At least 64 MB (depends on OS) |
| Screen resolution | At least 1,024 × 768 |
| Display colors | High Color (16-bit) or higher |
| Applicable PLC | FP0R / FP0 / FPε / FP-X / FP-e / FP1 / FP-M / FP2 / FP2SH / FP3 / FP10SH |

Note: Production of FP1, FP-M, FP3, and FP10SH was discontinued in August 2006, and they are no longer sold.

*1 Windows 7 is supported from Ver. 2.90.



Function instruction list



Classified by type, function instructions can be selected from the displayed list. (Simple help included.)

I/O comment edit function



Successive I/O comments can be input for each device type. Data from Excel and other applications can be copied and pasted via the clipboard.

Status display



Displays information concerning PLC usage situation and settings, and detailed information when an error occurs.

Text compiler



This software is for importing and exporting programs created in text format to and from FPWIN GR. Programs created on the PLC of another company can be edited as text and then be transferred to the FP Series without difficulty.

Text command input mode

Text command input mode



A ladder diagram is displayed as a mnemonic code is entered from the keyboard.

■ Accompanying Tools

Data Editor

This software for the PC is for reading and writing data stored in the memory of FP Series main unit or on an IC card. If a large data table is required in a PLC, the data can be created and edited on a PC and then download to the PLC.

Modem connection

Communication via modem is easy with FP Series units in isolated locations.

Wizard function

A Wizard function included in FPWIN GR since versions 2.2 can automatically generate ladder programs by simply entering and selecting required items in the dedicated screen. It can be used to assist in positioning, PID instruction input, and FP-e screen display instruction input.

Personal preference settings

It is possible to switch among preference settings for FPWIN GR, Data Editor and Text Compiler that are set up for different individuals.

List of Unit Specifications ①

CPU units

| Item | | FP2SH CPU unit | | | |
|-----------------------------------|----------------------------|-------------------|------------------------|-----------------------------|-------------------|
| Product No. (Part No.) | | FP2-C2L (AFP2221) | FP2-C2 (AFP2231) | FP2-C2P (AFP2235) | FP2-C3P (AFP2255) |
| Operation speed | for Basic instruction | From 0.03 μs | | | |
| | for High-level instruction | From 0.06 μs | | | |
| Program capacity | Built-in RAM | 32 k steps | | 60 k steps | 120 k steps |
| | When expanded | Not available | | | |
| Number of controllable I/O points | No expansion | Conventional type | Max. 768 points | | |
| | | H type | Max. 512 points | | |
| | When expanded | Conventional type | Max. 1,600 points | | |
| | | H type | Max. 2,048 points | | |
| When using remote I/O system | | Max. 8,192 points | | | |
| Operation memory | Internal relay | 14,192 points | | | |
| | Data register | 10,240 words | | | |
| | File register | 32,765 words | 32,765 words x 3 banks | | |
| | Link register | 8,448 words | | | |
| Optional memory | | F-ROM/EP-ROM | | Small PC card (F-ROM/S-RAM) | |
| Comment memory | | Built-in | | | |
| Calendar timer | | Built-in | | | |

Power supply units

| Product No. (Part No.) | | FP2-PSA1 (AFP2631) | FP2-PSA2 (AFP2632) | FP2-PSA3 (AFP2633) | FP2-PSD2 (AFP2634) |
|---------------------------------|---------------------------|---|-----------------------------|---|--------------------|
| Input | Rated voltage | 100 V to 120 V AC | 200 V to 240 V AC | 100 V to 240 V AC | 24 V DC |
| | Current consumption | 0.4 A or less (at 100 V AC) | 0.2 A or less (at 200 V AC) | 0.7 A or less (at 100 V AC) 0.4 A or less (at 200 V AC) | 2.5 A or less |
| | Surge current | 40 A or less (at 55°C 131 °F) | | 30 A or less (at 25°C 77 °F) | 10 A or less |
| | Frequency | 47 Hz to 63 Hz | | | |
| | Voltage fluctuation range | 85 to 132 V AC | 170 to 264 V AC | 85 to 264 V AC | 20.4 to 31.2 V DC* |
| Output | Output capacity at 5 V | Max. 2.5 A | | Max. 5 A | |
| Alarm contact capacity | | 1 A 30 V DC | | | |
| Alarm contact operation | | When the ALARM LED of CPU unit is lit | | | |
| Alarm contact type | | 1 Form C contact | | | |
| Leakage current | | Between input and ground terminals, 0.75 mA or less | | | |
| Breakdown voltage | | 1,500V AC for 1 minute (between input and ground terminals) | | | |
| Insulation resistance | | 100 MΩ 500 V DC (between input and ground terminals) | | | |
| Guaranteed lifetime | | 20,000 hours at 55°C 131 °F | | | |
| Overcurrent protection function | | Built-in overcurrent protection | | | |
| Fuse | | Built-in | | | |
| Terminal screw | | M3 | | | |
| Module size | | 1 module | 1 module | 2 modules | 2 modules |

Note: Allowable voltage fluctuation range after startup for the FP2-PSD2 is -35 % to +30 %. At startup, apply -15 % to +30 % the rated voltage for 100 ms or more.

Input units

| Item | DC input units | | | I/O mixed units (input side) | |
|-----------------------------------|---|----------------------------|----------------------------|--|--|
| | 16-point type | 32-point type | 64-point type | ^(Note 1) DC input type/Transistor output (NPN) type | ^(Note 2) DC input type/Transistor output (PNP) type |
| | FP2-X16D2 (AFP23023) | FP2-X32D2 (AFP23064) | FP2-X64D2 (AFP23067) | FP2-XY64D2T (AFP23467) | FP2-XY64D2P (AFP23567) |
| Rated input voltage | 12 to 24 V DC | 24 V DC | 24 V DC | 24 V DC | 24 V DC |
| Rated input current | 8 mA approx. (at 24V DC) | 4.3 mA approx. (at 24V DC) | 4.3 mA approx. (at 24V DC) | 4.3 mA approx. (at 24V DC) | 4.3 mA approx. (at 24V DC) |
| Impedance | 3 kΩ approx. | 5.6 kΩ approx. | 5.6 kΩ approx. | 5.6 kΩ approx. | 5.6 kΩ approx. |
| Min. ON voltage/Min. ON current | 9.6 V/4 mA | 19.2 V/4 mA | 19.2 V/4 mA | 19.2 V/4 mA | 19.2 V/4 mA |
| Max. OFF voltage/Max. OFF current | 2.5 V/1 mA | 5.0 V/1.5 mA | 5.0 V/1.5 mA | 5.0 V/1.5 mA | 5.0 V/1.5 mA |
| Response time | OFF→ON | 0.2 ms or less | 0.2 ms or less | 0.2 ms or less | 0.2 ms or less |
| | ON→OFF | 0.2 ms or less | 0.3 ms or less | 0.3 ms or less | 0.3 ms or less |
| Input points per common | 8 points/common (Either the positive or negative of the input power supply can be connected to the common terminal.) | 32 points/common | 32 points/common | 32 points/common | 32 points/common |
| Connection method | Terminal block (M3 screw) | Connector (one 40-pin) | Connector (two 40-pin) | Connector (two 40-pin) | Connector (two 40-pin) |

Notes: The number of ON points that can be actuated simultaneously is limited by the input voltage and the ambient temperature.

- The specifications also apply to the DC input, transistor output (NPN) type I/O mixed unit with ON pulse catch input FP2-XY64D7T (AFP23477).
However, the response time is as follows: OFF→ON: 0.2 ms or less (X0 to X1F); ON→OFF: 0.3 ms or less (X0 to X1B), 1.0 to 5.0 ms (X1C to X1F)
- The specifications also apply to the DC input, transistor output (PNP) type I/O mixed unit with ON pulse catch input FP2-XY64D7P (AFP23577).
However, the response time is as follows: OFF→ON: 0.2 ms or less (X0 to X1F); ON→OFF: 0.3 ms or less (X0 to X1B), 1.0 to 5.0 ms (X1C to X1F)

Output units

| Item | Relay output units | | | | Transistor output units | | | | I/O mixed units (output side) (Note 3, 4) | |
|---|--|--|---|---|--|--|--|--|--|--|
| | 6-point type (Note 1) | 16-point type | NPN open collector 16-point type (Note 2) | PNP open collector 16-point type (Note 2) | NPN open collector | PNP open collector | NPN open collector | PNP open collector | DC input type/Transistor output (NPN) type | DC input type/Transistor output (PNP) type |
| | FP2-Y6R (AFP23101) | FP2-Y16R (AFP23103) | FP2-Y16T (AFP23403) | FP2-Y16P (AFP23503) | FP2-Y32T (AFP23404) | FP2-Y32P (AFP23504) | FP2-Y64T (AFP23407) | FP2-Y64P (AFP23507) | FP2-XY64D2T (AFP23467) | FP2-XY64D2P (AFP23567) |
| Rated control capacity | 5 A 250 V AC (10 A/common) 5 A 30 V DC (10 A/common) Min. load: 100 mA 10 V (resistor load) | 2 A 250 V AC (5 A/common) 2 A 30 V DC (5 A/common) Min. load: 100 mA 100 mV (resistor load) | - | - | - | - | - | - | - | - |
| Rated load voltage | - | - | 5 to 24 V DC | 5 to 24 V DC | 5 to 24 V DC | 5 to 24 V DC | 5 to 24 V DC | 5 to 24 V DC | 5 to 24 V DC | 5 to 24 V DC |
| Max. load current | - | - | 0.5 A (at 12 to 24 V DC) 0.1 A (at 5 V DC) | 0.5 A (at 12 to 24 V DC) 0.1 A (at 5 V DC) | 0.1 A (at 12 to 24 V DC) 50 mA (at 5 V DC) | 0.1 A (at 12 to 24 V DC) 50 mA (at 5 V DC) | 0.1 A (at 12 to 24 V DC) 50 mA (at 5 V DC) | 0.1 A (at 12 to 24 V DC) 50 mA (at 5 V DC) | 0.1 A (at 12 to 24 V DC) 50 mA (at 5 V DC) | 0.1 A (at 12 to 24 V DC) 50 mA (at 5 V DC) |
| Max. surge current | - | - | 3 A 10 ms or less | 3 A 10 ms or less | 0.3 A | 0.3 A | 0.3 A | 0.3 A | 0.3 A | 0.3 A |
| OFF state leakage current | - | - | 1 µA or less | 1 µA or less | 1 µA or less | 1 µA or less | 1 µA or less | 1 µA or less | 1 µA or less | 1 µA or less |
| ON state maximum voltage drop | - | - | 0.5 V or less | 0.5 V or less | 1 V or less (at 6 to 26.4 V DC) 0.5 V or less (at 6 V DC or less) | 1.5 V or less (at 6 to 26.4 V DC) 0.5 V or less (at 6 V DC or less) | 1 V or less (at 6 to 26.4 V DC) 0.5 V or less (at 6 V DC or less) | 1.5 V or less (at 6 to 26.4 V DC) 0.5 V or less (at 6 V DC or less) | 1 V or less (at 6 to 26.4 V DC) 0.5 V or less (at 6 V DC or less) | 1.5 V or less (at 6 to 26.4 V DC) 0.5 V or less (at 6 V DC or less) |
| Repose time | OFF→ON | 10 ms or less | 10 ms or less | 0.1 ms or less | 0.1 ms or less | 0.1 ms or less | 0.1 ms or less | 0.1 ms or less | 0.1 ms or less | 0.1 ms or less |
| | ON→OFF | 8 ms or less | 8 ms or less | 0.3 ms or less | 0.3 ms or less | 0.3 ms or less | 0.3 ms or less | 0.3 ms or less | 0.3 ms or less | 0.3 ms or less |
| Power supply for driving internal circuit | Voltage | 24 V DC ±10% (21.6 V to 26.4 V DC) | 24 V DC ±10% (21.6 V to 26.4 V DC) | 4.75 to 26.4 V DC | 4.75 to 26.4 V DC | 4.75 to 26.4 V DC | 4.75 to 26.4 V DC | 4.75 to 26.4 V DC | 4.75 to 26.4 V DC | 4.75 to 26.4 V DC |
| | Current | 70 mA or less | 160 mA or less | 120 mA or less (at 24 V DC) | 70 mA or less (at 24 V DC) | 140 mA or less (at 24 V DC) | 150 mA or less (at 24 V DC) | 250 mA or less (at 24 V DC) | 270 mA or less (at 24 V DC) | 120 mA or less (at 24 V DC) |
| Input points per common | 2 points/common | 8 points/common | 8 points/common | 8 points/common | 32 points/common | 32 points/common | 32 points/common | 32 points/common | 32 points/common | 32 points/common |
| Connection method | Terminal block (M3 screw) | Terminal block (M3 screw) | Terminal block (M3 screw) | Terminal block (M3 screw) | Connector (one 40-pin) | Connector (one 40-pin) | Connector (two 40-pin) | Connector (two 40-pin) | Connector (two 40-pin) | Connector (two 40-pin) |

Notes: • The number of ON points that can be actuated simultaneously is limited by the input voltage and the ambient temperature. • The load current is limited by the external power supply voltage.
 1) The current capacity of each common terminal is 5 A or less. 2) The maximum load current of the transistor output unit is limited by the external power supply voltage.
 3) The specifications also apply to the DC input, transistor output (NPN) type I/O mixed unit with ON pulse catch input FP2-XY64D7T (AFP23477).
 4) The specifications also apply to the DC input, transistor output (PNP) type I/O mixed unit with ON pulse catch input FP2-XY64D7P (AFP23577).

Analog I/O units

Analog input

| Item | FP2-AD8X (AFP2401) | FP2-RTD (AFP2402) | FP2-AD8VI (AFP2400L) |
|---|---|--|---|
| Number of input points | 8 channels | 8 channels | 8 channels |
| Voltage | ±10 V (1/65,536) | - | ±10 V (1/65,536) |
| | 1 V to 5 V (1/13,107) | - | 1 V to 5 V (1/13,107) |
| Current | ±100 mV (1/65,536) | - | - |
| | - (Note) | - | ±20 mA (1/32,768) 4 mA to 20 mA (1/13,107) |
| Input range (resolution) | S: 0 to +1,500 °C 32 to +2,732 °F (0.1 °C 32.18 °F) | | - |
| | J: -200 to +750 °C -328 to +1,382 °F (0.1 °C 32.18 °F) | | |
| | J: -100 to +400 °C -148 to +752 °F (0.1 °C 32.18 °F) | | |
| | K: -200 to +1,200 °C -328 to +2,192 °F (0.1 °C 32.18 °F) | | |
| | K: -200 to +1,000 °C -328 to +1,832 °F (0.1 °C 32.18 °F) | | |
| | K: -200 to +600 °C -328 to +1,112 °F (0.1 °C 32.18 °F) | | |
| | T: -200 to +350 °C -328 to +662 °F (0.1 °C 32.18 °F) | | |
| | R: 0 to +1,500 °C 32 to +2,732 °F (0.1 °C 32.18 °F) | | |
| | N: -200 to +1,300 °C -328 to +2,372 °F (0.1 °C 32.18 °F) | | |
| | R.T.D. | Pt100: -200 to +650 °C -328 to +1,202 °F (0.1 °C 32.18 °F) | |
| Pt100: -100 to +200 °C -148 to +392 °F (0.1 °C 32.18 °F) | | | |
| JPt100: -200 to +650 °C -328 to +1,202 °F (0.1 °C 32.18 °F) | | | |
| JPt100: -100 to +200 °C -148 to +392 °F (0.1 °C 32.18 °F) | | | |
| JPt1000: -100 to +100 °C -148 to +212 °F (0.1 °C 32.18 °F) | | | |
| Conversion speed | Voltage | 500 µs/ch (not insulated), 5 ms (insulated) | 500 µs/ch |
| | Current | - | 500 µs/ch |
| | Thermocouple | 20 ms/ch | - |
| | R.T.D. | 20 ms/ch | - |
| Overall accuracy | Voltage: ±0.1 % FS (25 °C 77 °F), Voltage and temperature: ±0.3 % (0 to 55 °C 32 to 131 °F) | | ±0.3 % F.S. (0 to 55 °C 32 to 131 °F) |
| Insulation method | Between the input terminal and FP2 internal circuits: Photocoupler and DC/DC converter | | |
| | Between channels: PhotoMOS relay | | |
| Digital output | Averaging | | |
| | Offset setting | | |
| Broken wire sensing | Each channel (only when a thermocouple or R.T.D. is inputted) | Each channel | - |
| Input range change method | By the range setting switch: Batch switching of all channels | | |
| | By shared memory setting: Each channels | | |

Note: Current inputs can be converted into voltage inputs by attaching the supplied external resistor to the input terminal section.

Analog output

| Item | Analog output unit FP2-DA4 (AFP2410) | |
|------------------------------|--|--------------------------|
| Number of output points | 4 channels | |
| Output range (digital input) | Voltage | ±10 V (K-2048 to K+2047) |
| | Current | 0 to 20 mA (K0 to K4095) |
| Resolution | 1/4,096 | |
| Conversion speed | 500 ms/ch | |
| Overall accuracy | ±1.0 % F.S. or less (0 to 55 °C 32 to 131 °F) | |
| Insulation method | - Between the analog output terminal and FP2 internal circuits: Photocoupler - Between analog output channels: Not insulated | |
| Analog output | Hold/Non-hold setting by shared memory setting | |

List of Unit Specifications ②

ET-LAN2 unit (AFP27901)

Performance specification

| Item | Specifications |
|-------------------------------------|--|
| Communications function | - MEWTOCOL-COM: computer link function (Max. 2 kB) - MEWTOCOL-DAT: data transfer (Max. 1,020 words) - Transparent communication |
| Number of communication connections | Max. 8 connections |
| Transparent communications buffer | Transmit: Factory setting: (1k words/connection) x 3 |
| | Receive: Factory setting: (1k words/connection) x 3 |

Transmission specifications for communication interface

| Item | 100BASE-TX (Note 1) | 10BASE-T (Note 1) |
|-----------------------------------|----------------------------------|------------------------------------|
| Transmission speed | 100 Mbit/s | 10 Mbit/s |
| Transmission method | Base band | Base band |
| Max. segment length | 100 m 328 ft (Note 2) | 100 m 328 ft (Note 2) |
| Max. distance between nodes | 205 m 673 ft (2 segments) | 500 m 1,640 ft (5 segments) |
| Communication cable of connection | UTP (Category 5) | UTP (Category 3, 4 and 5) |

Notes: 1) Switching between 100BASE-TX and 10BASE-T is done automatically by auto negotiation function.
2) The standards cite 100 m **328 ft** as the maximum, but noise resistance measures such as attaching a ferrite core may be necessary in some cases, depending on the usage environment. Also, if the hub is positioned close to a control board, we recommend using it at a distance of 10 m **32.8 ft** or less.

MEWNET-VE2 link unit (AFP279601)

| Item | VE mode (PLC link) | FL-net mode |
|--------------------------------------|---|--|
| | Communication interface | Ethernet 10BASE-T |
| Communication speed | 10 Mbit/s | |
| Cycle time example | 50 ms/32 units (2,048 points/2,048 words) | |
| Cable length | 10BASE-T : 100 m 328 ft (500 m 1,640 ft) *The lengths in parentheses are available when a repeater is used. | |
| Communication protocol | MEWTOCOL | FL-net [FA link protocol (UDP/IP)] |
| Link communication specifications | Link relay 8,192 points/unit Link register 8,192 words/unit | |
| Message communication specifications | Max. 2,048 bytes (Compatible with MEWTOCOL) | Max. 1,024 bytes (Not compatible with MEWTOCOL) |
| Number of nodes | Max. 99 units | Max. 254 units |
| Other functions | Computer link Data transfer Remote programming Multilevel link communications | Interconnection with other companies' units |

Multi-communication unit (AFP2465)

○: Available
✕: Not available

| Item | General-purpose serial communications | | Computer link (Note 1) (Open protocol "MEWTOCOL" should be used.) | | PLC link function (MEWNET-W0) |
|--|---|--|--|--|---|
| | 1:1 communications | 1:N communications | 1:1 communications | 1:N communications | |
| Communication block used | AFP2803 AFP2804 | AFP2805 | AFP2803 AFP2804 | AFP2805 | AFP2803 AFP2805 |
| Interface | RS232C RS422 | RS485 | RS232C RS422 | RS485 | RS232C RS485 |
| Communication method | Full duplex | Two-wire half duplex | Full duplex | Two-wire half duplex | Token bus (Floating master) |
| Synchronous method | Start-stop synchronization | | | | |
| Transmission cable | Three-core or five-core shielded wire | Twisted-pair cable or VCTF | Three-core or five-core shielded wire | Twisted-pair cable or VCTF | Twisted-pair cable or VCTF |
| Transmission distance | 15 m 49.2 ft Max. 1,200 m 3,937 ft | Max. 1,200 m 3,937 ft | 15 m 49.2 ft Max. 1,200 m 3,937 ft | Max. 1,200 m 3,937 ft | 1,200 m 3,937 ft (RS485) 15 m 49.2 ft (RS232C) |
| Transmission speed (To be set in the system register) | 300 to 230,400 bps | 300 to 230,400 bps (19,200 bps when our C-NET adapter is connected) | 300 to 230,400 bps | 300 to 230,400 bps (19,200 bps when our C-NET adapter is connected) | 115,200 bps |
| Transmission code | ASCII, JIS7, JIS8 and Binary | | ASCII, JIS7 and JIS8 | | - |
| Transmission format (To be set in the system register) | Data length: 7 bits/8 bits | | | | |
| | Parity: 0/Invalid/Valid (Odd/Even) | | | | |
| | Stop bit: 1 bit/2 bits | | | | |
| | Start code: with STX / without STX | | - | | - |
| End code: CR/CR + LF/Time setting/ETX | | - | | - | |
| Number of stations | - | Max. 99 stations (Max. 32 stations when our C-NET adapter is connected) | - | Max. 99 stations (Max. 32 stations when our C-NET adapter is connected) | Max. 16 stations |
| PLC link capacity | - | - | - | - | Link relay: 1,024 points Link register: 128 words |
| COM1 (upper channel) | ○ | ○ | ○ | ○ | ○ |
| COM2 (lower channel) | ○ | ○ | ○ | ○ | ✕ |
| Number of attachable units | Max. 23 units (including 8 units for the computer link and 2 channels for the PLC link) | | | | |
| Supported versions | CPU unit: Ver. 1.4 or later, FPWIN-GR: Ver. 2.4 or later, FPWIN-PRO: Ver. 5.1 or later | | | | |

Note: 1) The protocol can be downloaded from: <http://www.panasonic.net/id/pidx/global>

Multi-wire link unit

| Item | FP2-MW (AFP2720) | | |
|--------------------------------|--------------------------------------|---|--------------------------------------|
| | W mode | W2 mode | F mode |
| Communication method | Token bus | | Polling |
| Transmission method | Base band | | |
| Transmission speed | 500 kbit/s | 500 kbit/s, 250 kbit/s | 500 kbit/s |
| Transmission distance | Extendable to 800 m 2,625 ft | Extendable to 800 m 2,625 ft 250 kbit/s: 1,200 m 3,937 ft 500 kbit/s: 800 m 2,625 ft | Extendable to 700 m 2,297 ft |
| Number of connectable stations | Max. 32 stations | | 1 master + Max. 32 slave stations |
| Transmission error check | CRC (Cyclic Redundancy Check) system | | |
| Synchronous method | Start-stop synchronization | | |
| Interface | RS485 compatible | | |
| Transmission cable | Twisted-pair cable | | Twisted-pair cable or VCTF cable |
| RAS function | Hardware self-diagnosis function | | |

Note: When the unit is used in W2 mode, it must be set by user programs.

S-LINK unit

| Item | S-LINK unit FP2-SL2 (AFP2780) | |
|--------------------------------|---|--|
| | | |
| Number of channels | 1 | |
| Number of I/O points | Max. 128 points The number of input and output points for each channel can be selected by the switch in the unit body. Input: 0, 32, 64, 96 or 128 points Output: 0, 32, 64, 96 or 128 points | |
| Rated power supply voltage | +24 V DC ±10 % Allowable ripples P-P: ±10 % or less (S-LINK terminal block IN-24 V, 1.6 A DC or less) | |
| Power consumption (Note 1) | [Current consumption of the S-LINK controller (incl. D-G line current consumption)] +24 V DC 1.6 A or less [Maximum allowable current supply (Supply to the S-LINK and I/O devices through the 24 V - 0 V line)] +24 V DC 5 A (Fuse: 5A or less) | |
| Transmission method | Bi-directional time division multiplex transmission | |
| Synchronous method | Bit synchronization and Frame synchronization | |
| Transmission protocol | S-LINK protocol | |
| Transmission speed | 28.5 kbit/s | |
| Transmission distance (Note 2) | Main signal line: Extendable to 200 m 656 ft (max. 400 m 1,312 ft when a booster is used) | |
| FAN-OUT (Note 2) | 320 | |
| Connection method | T-branch multi-drop wiring or standard multi-drop wiring [+24, 0 V, D-G (with a function of D-G short-circuit protection)] | |

Notes: 1) Refer to the "Power Capacity Determination" section of S-LINK Design Manual for details of the current consumption.
2) Refer to S-LINK Design Manual for the booster and FAN-OUT.

List of Unit Specifications ③

Positioning units RTEX (Network type)

| Item | 2 axes type | 4 axes type | 8 axes type |
|--|--|---|----------------------------|
| Part No. | AFP243610 | AFP243620 | AFP243630 |
| Product No. | FP2-PN2AN | FP2-PN4AN | FP2-PN8AN |
| Number of axes controlled | 2 axes (2 axes x 1 system) | 4 axes (4 axes x 1 system) | 8 axes (8 axes x 1 system) |
| Position control function | Control method | PTP control, Continuous Path (CP) control | |
| | Interpolation control | Two/Three axis linear interpolation, two axis circular interpolation, three axis spiral interpolation | |
| | Unit of control | pulse / mm / inch / degree | |
| | Positioning data | 650 points per axis (Standard area: 600 points, Expansion area: 25 points) | |
| | Backup | Parameters and data tables can be saved in FROM. | |
| | Acceleration/deceleration method | Linear/S-curve acceleration and deceleration | |
| | Acceleration/deceleration time | 0 to 10,000 ms (in increments of 1 ms) | |
| Positioning range | (-1,073,741,823 to +1,073,741,823 pulses) Increment/Absolute specification | | |
| Speed control function | Supported by a JOG operation (free-run operation) | | |
| Torque control function | Supported by a real-time torque control function | | |
| Home return | Search method: Home proximity (DOG) search | | |
| Others | Creep rate: Can be set freely | | |
| | Pulsar input operation supported | | |
| | Auxiliary output code and auxiliary output contact | | |
| Communication specifications | Dwell time supported | | |
| | In-position contact monitoring available | | |
| | Communication speed | 100 Mbps | |
| | Cables | Commercially-available LAN straight cable (Shielded type cable Category 5e) | |
| Connection system | Ring method | | |
| Communication cycle/Number of connectable stations | 0.5 ms, up to 8 axes/system (Command cycle: 1 ms) | | |
| Transmission distance | Between stations: 60 m 197 ft Extendable total length: 200 m 656 ft | | |

Positioning units Multifunction type (Pulse output type)

| Part No. | AFP2432 | AFP2433 | AFP2434 | AFP2435 |
|--|--|---|---------------------|------------------------------------|
| Product No. | FP2-PP21 | FP2-PP41 | FP2-PP22 | FP2-PP42 |
| Output type | Transistor | | Line driver | |
| Number of axes controlled | 2 axes, independent | 4 axes, independent | 2 axes, independent | 4 axes, independent |
| Position command | Command units: Pulse (The program specifies whether Increment or Absolute is used.) | | | |
| Speed command | Max. pulse count: Signed 32 bits (-2,147,483,648 to +2,147,483,647 pulses) | | | |
| Acceleration/deceleration command | Acceleration/deceleration | 1 pps to 500 kpps (can set in 1 pps) | | 1 pps to 4 Mpps (can set in 1 pps) |
| | 'S' Acceleration/deceleration | Can select from Sin curve, Secondary curve, Cycloid curve and Third curve. | | |
| Home return | Speed setting possible (changes return speed and search speed) | | | |
| Operation mode | Input terminals | Home input, Near home input, Over limit input (+), Over limit input (-) | | |
| | Output terminals | Deviation counter clear output signal | | |
| Startup time | • E point control (Linear and S accelerations/decelerations) | | | |
| | • P point control (Linear and S accelerations/decelerations) | | | |
| High-speed counter | • Home return operation (Home search) | | | |
| | • JOG operation | | | |
| Other functions | • JOG positioning operation | | | |
| | • Pulsar input function Transfer multiplication ratio (× 1, × 2, × 5, × 10, × 50, × 100, × 500, × 1,000) | | | |
| Internal current consumption (at 5 V DC) | • Real-time frequency change | | | |
| | • Infinity output | | | |
| External power supply | 0.02 ms or 0.005 ms selecting possible | | | |
| | Output mode | 1 pulse output (Pulse/Sign), 2 pulse output (CW/CCW) | | |
| Interface | Countable range | Signed 32 bits (-2,147,483,648 to +2,147,483,647 pulse) | | |
| | Input mode | 2-phase input*, Direction distinction input, Individual input (transfer multiple available for each.) | | |
| Current consumption | The flag to compare the elapsed value is built in. (The timing signal outputs at the optional position during an operation.) | | | |
| | Max. 200 mA | Max. 350 mA | Max. 200 mA | Max. 350 mA |
| Voltage | 21.6 V DC to 26.4 V DC | | | |
| | 50 mA | 90 mA | 50 mA | 90 mA |

* Previous FP2 positioning units (AFP2430 and AFP2431) are not compatible with the Multi-function type FP2 positioning unit.
 * 2-phase input cannot be used with multiples of one.

Flexible Network Slave Units (FNS)

| Item | PROFIBUS | DeviceNet | CANopen |
|---------------------|--|---|---|
| Communication speed | 9,600 bps to 12 Mbps Auto detection/Setting | 125 kbps to 500 kbps Auto detection/Setting | 10 kbps to 1 Mbps Auto detection/Setting |
| Communication data | Input / Output: 76 words (one unit average: 1 to 4 words) | Input: 128 words / Output: 128 words (at cyclic mode) | 128 words (for TPDO and RPDO) |
| Connection type | Reading operation data as serial I/O data via the PROFIBUS network | • Cyclic connection • Change Of State (COS) • Bitstroupe connection • Polled connection • Explicit connection | • Synchronous cyclic method • Asynchronous cyclic method • COS method • Exchanging PDO (Process Data Object) using the timer operation connection method |
| Insulation | Galvanic insulation | Galvanic insulation | Galvanic insulation |
| Others | Self-diagnosis function equipped | • UCM • CPI parameter • Self-diagnosis function equipped | Self-diagnosis function equipped |

High-speed counter units and Pulse I/O units

| Item | FP2 High-speed counter units | FP2 Pulse I/O units |
|-----------------------|-------------------------------------|--|
| Part No. | AFP2441 (NPN) AFP2451 (PNP) | AFP2442 (NPN) AFP2452 (PNP) |
| Input | Insulation method | Photocoupler insulation |
| | Rated input voltage | 24 V DC |
| | Rated input current | 7.5 mA approx. (when using 24 V DC) |
| | Input impedance | 3.2 kΩ approx. |
| | Usage voltage range | 20.4 V DC to 26.4 V DC |
| | Min. ON voltage/Min. ON current | 19.2 V/6 mA |
| | Min. OFF voltage/Min. OFF current | 5.0 V/1.5 mA |
| | Response time (Note 1) | OFF→ON: 1 μs or less ON→OFF: 2 μs or less |
| | Input time constant setting | None, 4 μs, 8 μs, 16 μs, 32 μs (set in 2-input units) |
| | Common method | 16 points/common |
| Counter | Number of counter channels | 4 channels |
| | Countable range | Signed 32 bits (-2,147,483,648 to +2,147,483,647) |
| | Max. countable speed (Note 1) | 200 kHz |
| | Input modes | 3 modes (direction control, individual input, phase input) |
| Interrupt | Min. input pulse width (Note 1) | 2.5 μs |
| | Other | 8 comparison outputs, multiplier function (1, 2, 4) |
| Output specifications | Number of interrupt points (Note 2) | None, 1 point/unit, 8 points/unit (set with mode setting switches) |
| | Interrupt processing delays | 50 μs or less (when using FP2SH CPU unit) |
| | Insulation method | Photocoupler insulation |
| | Rated load voltage | 5 to 24 V DC |
| | Rated load voltage range | 4.75 V DC to 26.4 V DC |
| | Max. load current | 0.1 A (A11 to A18, B11 to B14 pins), 0.8 A (B15 to B18 pins) |
| | Leakage current when OFF | 1 μA or less |
| | Max. voltage drop when ON | 0.5 V or less |
| | Response time | OFF→ON: 1 μs or less ON→OFF: NPN output type: 1 μs or less PNP output type: 5 μs or less |
| | Surge absorber | Zener diode |
| Counter | Common method | 16 points/common |
| | External power supply | Voltage: 20.4 V DC to 26.4 V DC Current (when using 24 V DC): NPN output type: 90 mA or less PNP output type: 200 mA or less |
| | Comparison output | 8 points (A11 to A18 pins) |
| | Channels | 4 channels (B11 to B18 pins) |
| Pulse output | Max. output frequency | 100 kHz |
| | Output mode | 2 modes (direction control, individual output) |
| PWM output | Number of output points | 4 channels (B15 to B18 pins) |
| | Max. load current | 0.8 A |
| | Cycle (Note 3) | 1 Hz to 30 kHz |
| Duty (Note 3) | 0 to 100 % (unit: 1 %) | |

Notes:
 1) This value is effective when the input time constant (filter) setting was set to "No setting".
 2) If interrupts are used at the 1 point/unit setting, the interrupt from the external input terminal B1 (X8) or the interrupt program from the comparison 0 (one of among INT16 to INT23) is booted.
 3) At maximum load current and resistance load. There may be distortion in the output waveform, depending on the load current and type of load.

Remote I/O Slave Unit (Common to MEWNET-F)

| Item | Specifications | |
|--|---|--|
| Communication method | Two-wire half duplex | |
| Synchronous method | Start-stop synchronization | |
| Transmission distance | Extendable to 700 m 2,297 ft per port (at two cabling routes) | |
| Transmission speed | 0.5 Mbps | |
| Transmission cable | 2-wire cable (VCTF 0.75 mm ² × 2C) | |
| Interface | Multidrop (RS485) | |
| Transmission error check | Cyclic Redundancy Check (CRC) method | |
| I/O control | Number of master units per CPU unit | Max. 4 units |
| | Connectable number of stations per master unit | Max. 32 stations |
| | Controllable number of points per master unit | Max. 4, 096 points |
| | Number of I/O points per each station | I/O Terminal Board |
| I/O Terminal Unit | | Per unit used alone: 16 points When expanded: 32 points * The number of occupied points of the 8-point and 16-point units is identical. If the input and output are used in combination, the I/O numbers are assigned from the input points first, and the number of points is as follows: 16 input points and 16 output points. |
| Number of slots per CPU unit | Number of slots per master unit | Max. 128 slots |
| | FP2 Slave Unit System | Max. 64 slots |
| Number of slots per each station | I/O Terminal Board | Max. 24 slots |
| | I/O Terminal Unit | 1 slot * There is only one slot even with the expanded configuration. |
| Units that can and cannot be connected to slave stations | Connectable unit | • I/O units • Serial Data Unit (SDU) • S-LINK Unit |
| | Not connectable unit | • Analog-related I/O units (A/D, D/A and RTD) • High-speed Counter Unit and Pulse I/O Unit (Connectable unless the interrupt function is used) • Link-related units (ET-LAN, VE, MW, FNS, MCU and CCU) • Positioning Unit Interpolation type • Positioning Unit Multi function type • Positioning Unit RTEX type |

Product types

CPU units (Built-in RAM)

| Product name | | Operation speed | Built-in RAM | Optional memory | | | Other | | Product No. | Part No. |
|--------------|--|-----------------|--------------|-----------------|------------------------------|------------------------------|----------------------|----------------------|-------------|----------|
| | | | | Expansion RAM | ROM | IC memory card | Calendar timer | Comment memory | | |
| FP2SH | 32 k Standard type | From 0.03 μs | 32 k steps | Not available | Available (separately sales) | Not available | Available (built-in) | Available (built-in) | FP2-C2L | AFP2221 |
| | 60 k Standard type | | 60 k steps | Not available | Available (separately sales) | Not available | Available (built-in) | Available (built-in) | FP2-C2 | AFP2231 |
| | 60 k type with IC memory card interface | | 60 k steps | Not available | Available (built-in) | Available (separately sales) | Available (built-in) | Available (built-in) | FP2-C2P | AFP2235 |
| | 120 k type with IC memory card interface | | 120 k steps | Not available | Available (built-in) | Available (separately sales) | Available (built-in) | Available (built-in) | FP2-C3P | AFP2255 |

Optional memories

| Product name | Specifications | Part No. |
|---|---|----------|
| Expansion memory board | Memory board in which the nonvolatile memory was mounted beforehand | AFP2208 |
| IC memory card (Small PC card) for FP2SH CPU unit with IC memory card interface | SRAM Perfect for data memory Can also be used for program backup. Battery backups. | AFP2209 |
| FP Memory Loader | Data clear type | AFP8670 |
| | Data hold type | AFP8671 |

Backplanes

| Product name | Specifications | Product No. | Part No. | |
|---------------------|-------------------|---|------------|------------|
| FP2 Backplane | Conventional type | 5-module type (for master) | FP2-BP05 | AFP25005 |
| | | 7-module type (for master and expansion) | FP2-BP07 | AFP25007 |
| | | 9-module type (for master and expansion) | FP2-BP09 | AFP25009 |
| | | 12-module type (for master and expansion) | FP2-BP12 | AFP25012 |
| | | 14-module type (for master and expansion) | FP2-BP14 | AFP25014 |
| | H type | 8 slots (for master) | FP2-BP11MH | AFP25011MH |
| FP2 Expansion Cable | | 8 slots (for expansion) | FP2-BP10EH | AFP25010EH |
| | | 0.6 m 2.0 ft | FP2-EC | AFP2510 |
| | | 2 m 6.6 ft | FP2-EC2 | AFP2512 |

Power supply units

| Product name | Specifications | Product No. | Part No. |
|-----------------------|---------------------------------------|-------------|----------|
| FP2 Power Supply Unit | Input: 100 to 120 V AC, Output: 2.5 A | FP2-PSA1 | AFP2631 |
| | Input: 200 to 240 V AC, Output: 2.5 A | FP2-PSA2 | AFP2632 |
| | Input: 100 to 240 V AC, Output: 5 A | FP2-PSA3 | AFP2633 |
| | Input: 24 V DC, Output: 5 A | FP2-PSD2 | AFP2634 |

I/O units

| Product name | Type | Number of point | Connection method | Specifications | Product No. | Part No. |
|--------------------|---------------------------------|---------------------------------------|-------------------|---|-------------|----------|
| FP2 Input Unit | DC input | 16 points | Terminal block | 12 to 24 V DC | FP2-X16D2 | AFP23023 |
| | | 32 points | Connector | 24 V DC | FP2-X32D2 | AFP23064 |
| | | 64 points | Connector | 24 V DC | FP2-X64D2 | AFP23067 |
| FP2 Output Unit | Relay output | 6 points | Terminal block | 5 A, 2 points per one common | FP2-Y6R | AFP23101 |
| | | 16 points | Terminal block | 2 A, 8 points per one common | FP2-Y16R | AFP23103 |
| | Transistor output NPN | 16 points | Terminal block | 0.5 A (12 to 24 V DC), 0.1 A (5 V DC) | FP2-Y16T | AFP23403 |
| | | 32 points | Connector | 0.1 A (12 to 24 V DC), 50 mA (5 V DC) | FP2-Y32T | AFP23404 |
| | | 64 points | Connector | 0.1 A (12 to 24 V DC), 50 mA (5 V DC) | FP2-Y64T | AFP23407 |
| | Transistor output PNP | 16 points | Terminal block | 0.5 A (12 to 24 V DC), 0.1 A (5 V DC) | FP2-Y16P | AFP23503 |
| | | 32 points | Connector | 0.1 A (12 to 24 V DC), 50 mA (5 V DC) | FP2-Y32P | AFP23504 |
| | | 64 points | Connector | 0.1 A (12 to 24 V DC), 50 mA (5 V DC) | FP2-Y64P | AFP23507 |
| FP2 I/O Mixed Unit | DC input, Transistor output NPN | Input: 32 points Output: 32 points | Connector | Input: 24 V DC Output: 0.1 A (12 to 24 V DC), 50 mA (5 V DC) | FP2-XY64D2T | AFP23467 |
| | | | | Input: 24 V DC Output: 0.1 A (12 to 24 V DC), 50 mA (5 V DC) with ON pulse catch input | FP2-XY64D7T | AFP23477 |
| | DC input, Transistor output PNP | Input: 32 points Output: 32 points | Connector | Input: 24 V DC Output: 0.1 A (12 to 24 V DC), 50 mA (5 V DC) | FP2-XY64D2P | AFP23567 |
| | | | | Input: 24 V DC Output: 0.1 A (12 to 24 V DC), 50 mA (5 V DC) with ON pulse catch input | FP2-XY64D7P | AFP23577 |

* Pressure welding socket is supplied. A special tool (Part No.: **AXY52000FP**) is needed for connection.
Please purchase separately if you are using a terminal or flat cable socket.

Intelligent units for Analog I/O

| Product name | Specifications | Number of I/O points | Product No. | Part No. |
|------------------------|---|---------------------------|------------------|-----------------|
| FP2 Analog Input Unit | FP2-AD8VI Between channels: Not insulated, Voltage: 1 to 5 V, ±10 V Current: 4 to 20 mA, ±20 mA | Analog input: 8 channels | FP2-AD8VI | AFP2400L |
| | FP2-AD8X Between channels: Insulated, Voltages, Currents, Thermocouples, R.T.D. (Resistance Thermometer Devices) | Analog input: 8 channels | FP2-AD8X | AFP2401 |
| | FP2-RTD R.T.D.: Pt100, JPt100, JPt1000 type | R.T.D. input: 8 channels | FP2-RTD | AFP2402 |
| FP2 Analog Output Unit | Voltage: -10 to +10 V, Current: 0 to 20 mA, Resolution: 1/4,096 | Analog output: 4 channels | FP2-DA4 | AFP2410 |

Positioning units, High-speed counter units and Pulse I/O units

| Product name | Specifications | | | Product No. | Part No. |
|--|---|--|-------------------|------------------|------------------|
| | Output type | Number of axes controlled | Speed command | | |
| FP2 Positioning Unit RTEX | Network | 2 axes type | 1 pps to 32 Mpps | FP2-PN2AN | AFP243610 |
| | | 4 axes type | | FP2-PN4AN | AFP243620 |
| | | 8 axes type | | FP2-PN8AN | AFP243630 |
| Control Configurator PM | Dedicated tool software for positioning unit RTEX, Japanese version | | | AFPS66110 | AFPS66110 |
| | Dedicated tool software for positioning unit RTEX, English version | | | AFPS66510 | AFPS66510 |
| FP2 Positioning Unit Multi function type <small>(Note 3)</small> | Transistor | 2 axes, independent | 1 pps to 500 kpps | FP2-PP21 | AFP2432 |
| | | 4 axes, independent | | FP2-PP41 | AFP2433 |
| | Line driver | 2 axes, independent | 1 pps to 4 Mpps | FP2-PP22 | AFP2434 |
| | | 4 axes, independent | | FP2-PP42 | AFP2435 |
| FP2 Positioning Unit Interpolation type | Transistor | 2 axes (Linear/circular, interpolation and synchronization) | 1 pps to 500 kpps | FP2-PP2T | AFP243710 |
| | | 4 axes (2-axis linear, 2-axis circular, 3-axis linear, 3-axis spiral interpolation and 2-axis synchronization) | | FP2-PP4T | AFP243720 |
| | Line driver | 2 axes (Linear/circular, interpolation and synchronization) | 1 pps to 4 Mpps | FP2-PP2L | AFP243711 |
| | | 4 axes (2-axis linear, 2-axis circular, 3-axis linear, 3-axis spiral interpolation and 2-axis synchronization) | | FP2-PP4L | AFP243721 |
| FP2 High-speed Counter Unit | 8 interrupt inputs, 4-channel high-speed counter, 8 comparison outputs, Input: 24 V DC, Output: 5 to 24 V DC (0.1 A, 12 points / 0.8 A, 4 points) | | NPN output | FP2-HSCT | AFP2441 |
| | | | PNP output | FP2-HSCP | AFP2451 |
| FP2 Pulse I/O Unit | 8 interrupt inputs, 4-channel high-speed counter, 8 comparison outputs, 4-channel pulse output, 4-channel PWM output, Input: 24 V DC, Output: 5 to 24 V DC (0.1 A, 12 points / 0.8 A, 4 points) | | NPN output | FP2-PXYT | AFP2442 |
| | | | PNP output | FP2-PXYP | AFP2452 |

Notes:

- 1) Pressure welding socket is supplied. A special tool (Part No. **AXY52000FP**) is needed for connection. Please purchase separately if you are using a terminal or flat cable socket.
- 2) Please refer to "FP2 catalog" for model No. of Motor driver I/F terminal II.
- 3) Previous **FP2** positioning units (**AFP2430** and **AFP2431**) are not compatible with the multi function type **FP2** positioning unit. Please contact us.

Serial communication and link-related intelligent units

| Product name | Specifications | Number of channel | Product No. | Part No. | |
|------------------------------|--|--|------------------|--------------------|--------------------|
| FP2 VE2 Link Unit | 10 Mbps, 8,192 points / 8,192 words, Max. 99 units (VE mode), Max. 254 units (FL-net), 2,500 m 8,202 ft | 1 channel | FP2-VE2 | AFP279601 | |
| FP2 ET-LAN2 Unit | Ethernet-compatible unit for FP2SH To be mounted on the CPU backplane | 1 channel | FP2-ET2 | AFP27901 | |
| Control Configurator ET | ET-LAN unit setting software, Japanese version | - | AFPS32110 | AFPS32110 | |
| | ET-LAN unit setting software, English version | - | AFPS32510 | AFPS32510 | |
| FP2 Multi-wire Link Unit | For PLC links Compatible with MEWNET-W / MEWNET-W2 | 1 channel | FP2-MW | AFP2720 | |
| FP2 PROFIBUS DP Master Unit | Number of connectable units: 1 master unit and 127 slave units Transmission speed / distance: 9.6 kbps to 12 Mbps / 12 km 39,370 ft (when using a repeater) | - | - | AFP27971 | |
| FP2 DeviceNet Master Unit | Number of connectable units: 1 master unit and 63 slave units Transmission speed / distance: 500 kbps / 100 m 328 ft , 250 kbps / 250 m 820 ft , 150 kbps / 500 m 1,640 ft | - | - | AFP27972 | |
| FP2 CANopen Master Unit | Number of connectable units: 127, including master and slave units Transmission speed / distance: 1 Mbps / 25 m 82 ft , 10 kbps / 500 m 1,640 ft | - | - | AFP27973 | |
| FP2 FNS Unit | Can be connected to PROFIBUS DP / DeviceNet / CANopen as a slave unit by selecting a communication block. | 1 channel | FP2-FNS | AFP27930 | |
| FP2 Multi-Communication Unit | Communication block | For connection to PROFIBUS DP as a slave unit | - | AFPN-AB6200 | AFPN-AB6200 |
| | Communication block | For connection to DeviceNet as a slave unit | - | AFPN-AB6201 | AFPN-AB6201 |
| | Communication block | For connection to CANopen as a slave unit | - | AFPN-AB6218 | AFPN-AB6218 |
| FP2 Multi-Communication Unit | Up to two blocks to be attached can be selected among RS232C, RS422, and RS485 blocks. General-purpose serial communications, computer links, PLC links (MEWNET-W0) | | 2 channels | FP2-MCU | AFP2465 |
| | RS232C block | (For the multi-communication unit) Max. 230 kbps, 15 m 49 ft | 1 channel | FP2-CB232 | AFP2803 |
| | RS422 block | (For the multi-communication unit) Max. 230 kbps, 1,200 m 3,937 ft | 1 channel | FP2-CB422 | AFP2804 |
| | RS485 block | (For the multi-communication unit) For PLC links (MEWNET-W0): 115 kbps, 16 stations, 1,200 m 3,937 ft | 1 channel | FP2-CB485 | AFP2805 |

Intelligent units for remote I/O control

| Product name | Specifications | Controllable I/O points | Product No. | Part No. | | |
|---|---|-------------------------------------|-------------------------------------|------------------|-----------------|-----------------|
| FP2 Multi-wire Link Unit | Can connect as the remote I/O system MEWNET-F master station. Perfect for remote I/O systems using many points | Max. 4,096 points per one unit | FP2-SMW | AFP2720 | | |
| FP2 Remote I/O Slave Unit | Can connect as the remote I/O system MEWNET-F slave station. I/O unit and positioning unit can be attached. | Max. 3,072 points per one unit | FP2-RMS | AFP2745 | | |
| FP I/O Terminal Board [MIL connector type] | 12 V DC input / 0.2 A Transistor output | Input: 16 points, Output: 16 points | AFP87445 | AFP87445 | | |
| | 24 V DC input / 0.2 A Transistor output | Input: 16 points, Output: 16 points | AFP87446 | AFP87446 | | |
| FP I/O Terminal Board [Terminal block type] | 24 V DC input / 0.2 A Transistor output | Input: 16 points, Output: 16 points | AFP87444 | AFP87444 | | |
| | 24 V DC input / 2 A Relay output | Input: 16 points, Output: 8 points | AFP87432 | AFP87432 | | |
| FP I/O Terminal Unit | Serves as a slave controller. Expandable up to 32 points. (Operating voltage: 24 V DC) | FP I/O Terminal Unit (basic) | Input unit 24 V DC input | Input 8 points | AFP87421 | AFP87421 |
| | | | Input 16 points | AFP87422 | AFP87422 | |
| | | FP I/O Terminal Expansion Unit | Output unit 0.5 A Transistor output | Output 8 points | AFP87423 | AFP87423 |
| | | | | Output 16 points | AFP87424 | AFP87424 |
| | | | Input unit 24 V DC input | Input 8 points | AFP87425 | AFP87425 |
| | | | | Input 16 points | AFP87426 | AFP87426 |
| Output unit 0.5 A Transistor output | Output 8 points | AFP87427 | AFP87427 | | | |
| | Output 16 points | AFP87428 | AFP87428 | | | |
| FP2 S-LINK Unit | Direct connection to S-LINK reduced-wiring system Unit with 128 points × 2 channels | 128 points per one unit | FP2-SL2 | AFP2780 | | |

Maintenance parts

| Product name | Specifications | Product No. | Part No. |
|--|--|----------------|-------------------|
| Spare battery | For FP2SH CPU unit, battery with cable | AFP8801 | AFP8801 |
| Dummy unit | For blank slot | FP2-DM | AFP2300 |
| Small PC card | For AFP2209 | - | AFP2806 |
| Terminal block for FP2 I/O unit | FP2 I/O unit (terminal block type) supplied. (5 pieces) | - | AFP2800 |
| Discrete-wire connector set (supplied) | FP2 I/O unit and positioning unit supplied. (2 pieces) | - | AFP2801 |
| Flat cable connector set (40 leads) | For FP2 I/O unit and positioning unit. For simple connection using a flat cable. (2 pieces) | - | AFP2802 |
| Multi-wire connector pressure contact tool | Necessary when wiring transistor output type connectors. | - | AXY52000FP |

Control FPCWIN Pro (IEC61131-3 compliant Windows version software)

| Product name | Type | Part No. | Applicable model | | | | | | | | | | |
|--|------------------|--------------------|------------------|-------|------|-----|-------------|------|------|-------|----------------|---|---|
| | | | FP2 | FP2SH | FP-X | FPΣ | FP0 FP-e | FP0R | FP1* | FP-M* | FP3* FP10SH | | |
| Windows version tool software Control FPCWIN Pro | Japanese version | CD-ROM for Windows | AFPS50160 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | English version | CD-ROM for Windows | AFPS50560 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

* The production of **FP1**, **FP-M**, **FP3** and **FP10SH** has been discontinued.

Note: **FP-X** compatible versions: Relay output type - Ver. 5.1 or later; Transistor output type - Ver. 5.3 or later

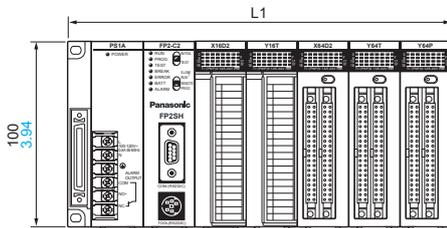
Control FPCWIN GR (Windows version software)

| Product name | Type | | Product No. | Part No. | Applicable model | | | | | | | | | |
|---|--------------------------------------|---|---------------------|------------------|------------------|-------|------|-----|-------------|------|------|-------|----------------|--|
| | | | | | FP2 | FP2SH | FP-X | FPΣ | FP0 FP-e | FP0R | FP1* | FP-M* | FP3* FP10SH | |
| Windows version tool software Control FPCWIN GR | Japanese version tool kit with cable | CD-ROM for Windows, with cable (AFC8503) for connection of FP to DOS/V PC | FPWINGRF-JP2 | AFPS10122 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | English version, Full type | CD-ROM for Windows | FPWINGRF-EN2 | AFPS10520 | | | | | | | | | | |
| | English version, Small type | CD-ROM for Windows | FPWINGRF-EN2 | AFPS11520 | x | x | ○ | ○ | ○ | ○ | ○ | ○ | x | |
| | Chinese version | CD-ROM for Windows | FPWINGRF-CN2 | AFPS10820 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | Korean version | CD-ROM for Windows | FPWINGRF-KR2 | AFPS10920 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |

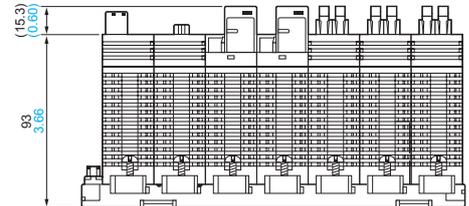
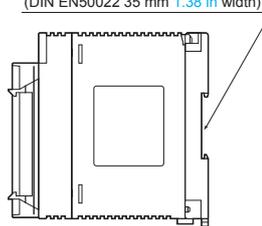
* The production of **FP1**, **FP-M**, **FP3** and **FP10SH** has been discontinued.

Note: **FP-X** compatible versions: Relay output type - Ver. 2.50 or later; Transistor output type - Ver. 2.70 or later

Dimensions (Unit: mm in)

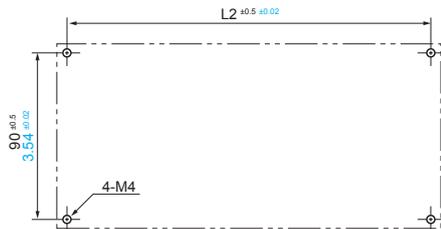


DIN standard rail attachment groove (DIN EN50022 35 mm 1.38 in width)



* The illustration shows a conventional 7-module type backplane.

Mounting dimension (Tolerance: $\pm 1.0 \pm 0.04$)



Conventional backplanes

| | 5-module | 7-module | 9-module | 12-module | 14-module |
|------------|-------------|-------------|--------------|--------------|--------------|
| L1 (mm in) | 140 5.51 | 209 8.23 | 265 10.43 | 349 13.74 | 405 15.94 |
| L2 (mm in) | 130 5.12 | 199 7.83 | 255 10.04 | 339 13.35 | 395 15.55 |

Note: The 5-module type does not have an expansion connector.

H type backplanes

| | 11-module (master backplane) | 10-module (expansion backplane) |
|------------|---------------------------------|------------------------------------|
| L1 (mm in) | 349 13.74 | 349 13.74 |
| L2 (mm in) | 339 13.35 | 339 13.35 |

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