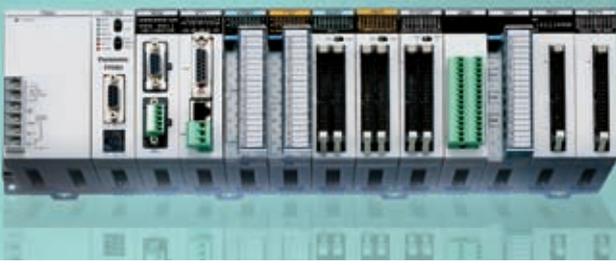**Panasonic**
**ideas for life**



# FP2/FP2SH Series

## Programmable Controllers

# CPU Units

## Top Performance, Full Range of Functions

### ■ CPU units

#### Selectable from six types, according to the application

There are six types of CPU units, including the standard type and the type with preinstalled commonly-used advanced functions. This selection allows for more economical system development according to the application. See page 12 for details.

### ■ FP2

#### Superior cost performance

Standard type
FP2-C1

With 64 input points
FP2-C1D

With S-LINK
FP2-C1SL

### ■ FP2SH

#### Industry's highest class processing speed
#### Adequate programming capacity

60k step
standard type
FP2-C2

60k step type
for small PC card
FP2-C2P

120k step type
for small PC card
FP2-C3P

### ■ Body size

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

The front face area is 140mm wide and 100mm high (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: 108.3mm)

140mm

100mm
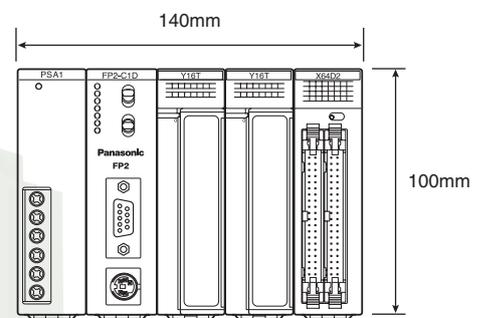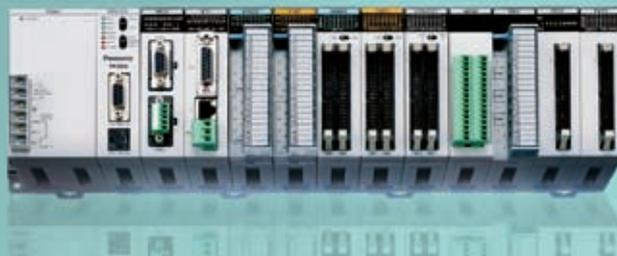
# Memory and I/O Control

## Flexible Expandability

### ■ Memory and I/O control

**Equipped with an adequate program memory and operating memory capacity**

The body is compact; however, the standard program memory capacity of FP2/FP2SH is as large as 16k/60k steps, and when optional memory is added, 32k/120k steps. A variety of operation memory types are also available. The maximum number of controlled I/O points is 2,048 (2,048/8,192 for FP2/FP2SH when using remote I/O units), which is sufficient for medium-scale control.

#### Addition of optional memory

FP2: Addition of optional memory to the CPU unit allows it to store up to 32k program steps, provides it with the clock/calendar function, and makes comment writing possible.

FP2SH: An optional IC card can be used as program memory or expanded data memory.

#### I/O point expansion by adding backplanes
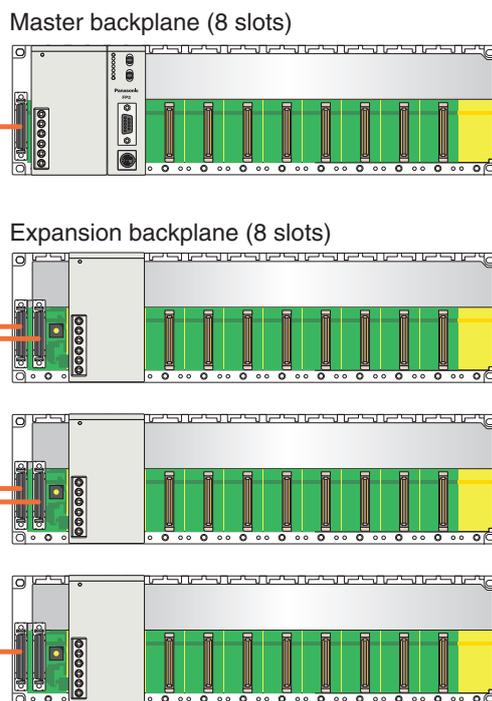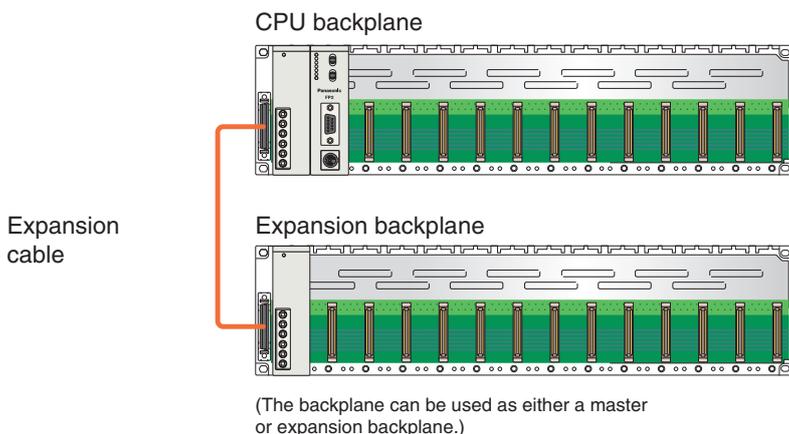
See page 14 for details.
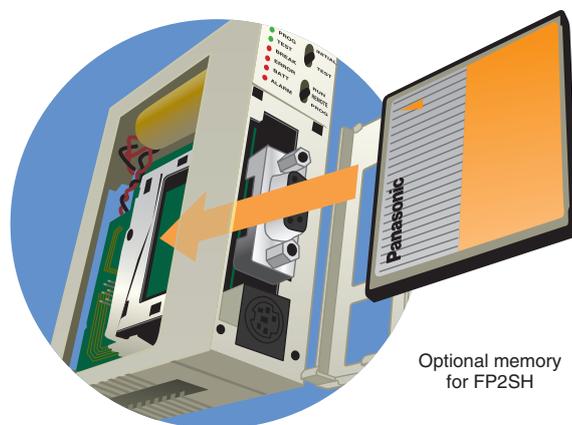
*Optional memory for FP2SH*

*NEW!*

### ■ 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.

### ■ H type backplane

Up to three backplanes can be added to one master backplane. Now up to 32 units can be connected and up to 2,048 I/O points controlled.

CPU backplane

Master backplane (8 slots)

Expansion cable

Expansion backplane

Expansion backplane (8 slots)

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

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

The H type and conventional type cannot be used in combination.
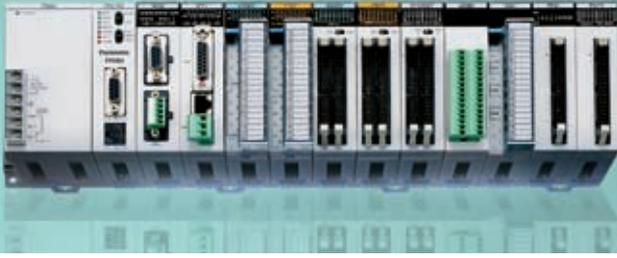
# Positioning

## Optimal Combination with Servo Drives

### ■ "RTEX" positioning units

NEW!

**Compatible with Realtime Express MINAS A4N\*
network servo systems.
Facilitate multi-axis high precision positioning**

- ■ High-accuracy multi-axis positioning control achieved by high-speed 100Mbps communication.
- ■ Compatible with commercially available LAN cables, significantly reducing wiring costs.
- ■ Two-axis unit available in addition to the four- and eight-axis units.
- ■ Data from a maximum of 600 points can be registered for each axis.
- ■ Three-axis helical interpolation supported in addition to two-axis linear and two-axis circular interpolation functions.
- ■ Dedicated tool software "Configurator PM" supports operations from setup through startup and monitoring.
- ■ Equipped with a manual pulser input terminal, allowing for fine teaching.
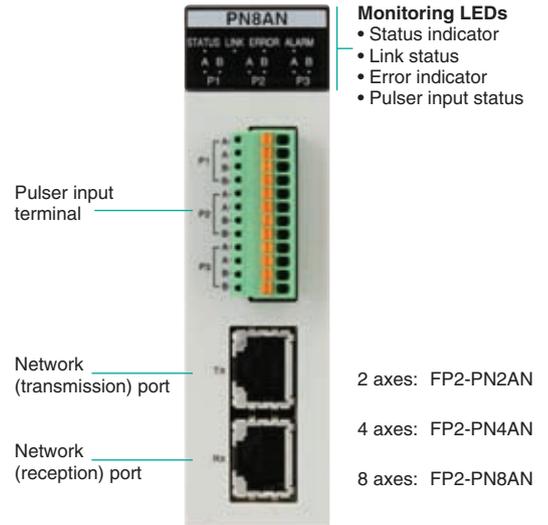
\* Realtime Express and MINAS A4N are a trademark and a product name of Matsushita Electric Industrial Co., Ltd.

### High-speed 100Mbps communications

**Monitoring LEDs**
- Status indicator
- Link status
- Error indicator
- Pulser input status

Pulser input terminal

Network (transmission) port

Network (reception) port

2 axes: FP2-PN2AN

4 axes: FP2-PN4AN

8 axes: FP2-PN8AN

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

- ■ Up to 32 eight-axis units can be connected and up to 256 axes controlled (when using FP2SH with H type backplane).
- ■ Selectable among two, four, and eight-axis types to flexibly support control system configurations of a few or multiple axes.
- ■ Use in combination with the ultra-high speed and large capacity FP2SH CPU unit (20k steps/1ms (measured by our company), program capacity of 120k steps) adequately supports the control of large-scale equipment.

**System configuration:**

Maximum number of connectable positioning units "RTEX"

FP2: 16 units    FP2SH: 32 units

One positioning unit can control two to eight axes (depending on the type).

Servo amplifier: MINAS A4N manufactured by Matsushita Electric Industrial Co., Ltd.

TOOL port of CPU unit

Commercially available LAN cable
(Ethernet category 5e shielded type)

I/O signals of home position proximity sensors, limit sensors, etc. are sent to A4N

Dedicated tool software for positioning units "RTEX"
**Configurator PM**

Programming tools
**Control FPWIN GR
Control FPWIN Pro**

Dedicated tool software for MINAS manufactured by Matsushita Electric Industrial Co., Ltd.
**Panaterm**
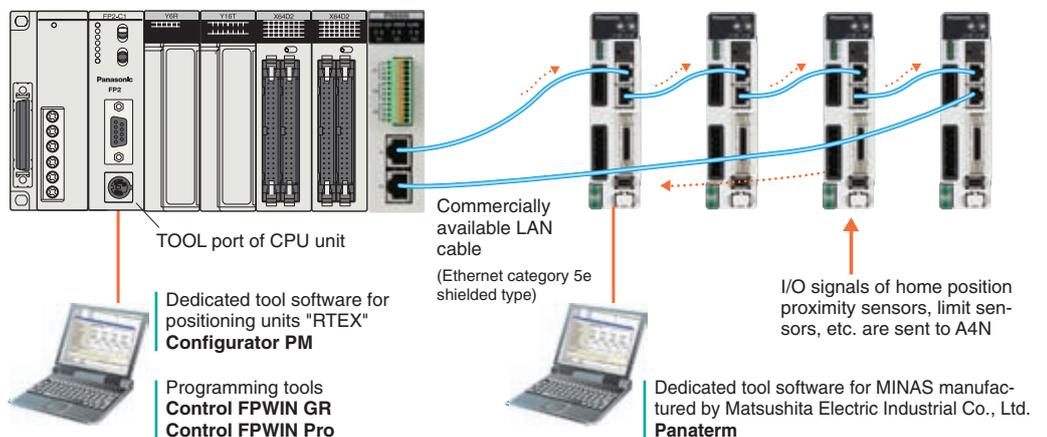
Contact for inquiries about MINAS AC servomotor series: Panasonic Electric Works Europe AG
Telephone: +49 (0) 8024-648-0, Fax: +49 (0) 8024-648-111, www.panasonic-electric-works.com
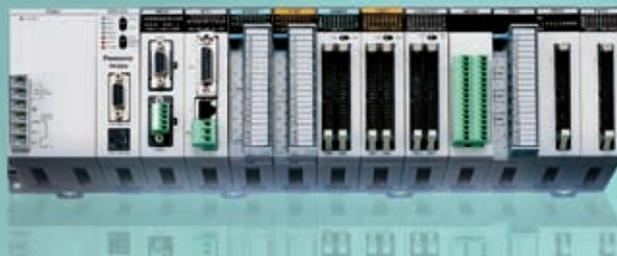
# Positioning

## High-Speed, High-Precision Positioning

### ■ Positioning units

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

Support pulse-input type stepping motors, and servomotors. The speed command range is up to 4Mpps, allowing for high-speed and high-accuracy positioning. The startup time is as high as 0.005ms, 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.)

- ■ The feedback pulse count function counts output pulses from encoders or other devices.
- ■ The jog positioning function 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 FPWIN Pro" can be downloaded from our Website: www.panasonic-electric-works.com
- ■ Motor Driver I/F Terminal II is available for connection with MINAS AC servo series.

For 1 axis (AFP8503)          For 2 axes (AFP8504)

### ■ High-speed counter units and pulse I/O units

**Interrupt, counting, pulse output, and PWM output functions are integrated in a single unit**

- ■ Equipped with four channels of a maximum of 200kHz high-speed counter inputs, allowing for fine control.
- ■ Equipped with eight user-allocatable outputs for the four high-speed counter channels. The number of counter stages can be changed.
- ■ Interrupt function can start interrupt program when the time specified elapses or via external signal.
- ■ Control up to 100kpps pulse output and up to 30kpps PWM output.
- ■ A single module has high-speed counter, interrupt, general I/O, pulse output*, PWM output* functions, allowing for highly efficient system configuration.

* Only available with the pulse I/O units.

Positioning unit (2 axes)
FP2-PP21          FP2-PP22

Positioning unit (4 axes)
FP2-PP41          FP2-PP42

### ■ Configuration

■ One unit can control up to 4 axes.

Motor driver
Motor driver
Motor driver
Motor driver

Stepping motor
Servomotor

Pulse I/O units
FP2-PXYT(NPN)
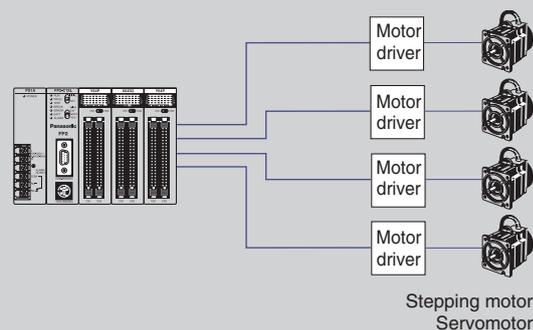
FP2-PXYP(PNP)

High-speed counter units
FP2-HSCT(NPN)

FP2-HSCP(PNP)

### ■ Configuration

Counts RPM based on the encoder output, compares the count with the preset RPM, and instructs the inverter to adjust the speed or stop operation.

Set conditions with the F151 high-level instruction

Inverter

C=P Speed adjustment input →

C>P Stoppage input →                    M

Input the encoder output into the ← phase input mode.          E

Read data with the F150 high-level instruction
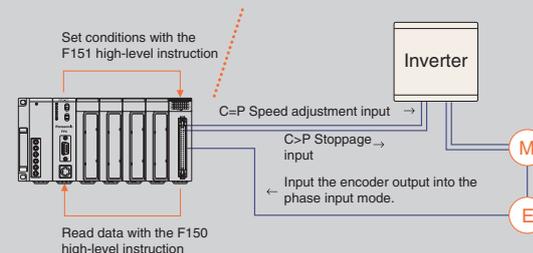
# Analog Control

## Accurate Process Control

### ■ Analog control

**Multi-range control of a variety of equipment is possible. The units can be directly connected with thermocouples and resistance temperature detectors**

■ **Support voltage/current/temperature sensor ranges**
  The analog input unit supports voltage, current, and temperature sensors.
  The analog output unit supports voltage or current output.
  Different voltage/current ranges can be controlled concurrently.

■ **Equipped with multiple channels**
  The input unit has eight channels, and the output unit has four.
  Space-saving multiple-channel control is possible.

■ **High-speed conversion at 500ms by each channel**
  The speed of voltage and current input/output conversion can reach as high as 500ms.

■ **I/O refresh system**
  Since input/output data is allocated to the I/O memory, complicated programming is not necessary.

### ■ Configuration

Laser analog sensor → Current input

Pressure sensor → Current input

Analog input unit
Analog output unit

Voltage output (speed command) → Inverter

### ■ Analog input units

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

**High-speed, high-accuracy, multiple-input unit with 8 isolated channels**

| Industry's fastest level |
| --- |
| High-speed achieved by highly reliable isolation among channels<br>Temperature conversion: 20ms/ch<br>Voltage conversion: 5ms/ch<br>(Without insulation setting: 500ms/ch) |

| Industry's top level |
| --- |
| High-accuracy conversion<br>Voltage: ±0.1% (25°C)<br>Temperature: ±0.3% (0 to 55°C) |

| Multiple inputs |
| --- |
| A single unit supports inputs of thermocouple, RTD, and voltage data[*1]. |

FP2-AD8X

■ For users who require faster and more accurate temperature control.

■ For users who require multiple isolated input channels or who want to reduce the cost per 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.

### 8 inputs unit solely for RTDs (Pt100/Pt1000)

| High-speed, high-accuracy |
| --- |
| Conversion speed: 20ms/ch<br>Conversion accuracy: ±0.3% (0 to 55°C)<br><br>For users who input RTD data only and require more affordable type. |

FP2-RTD
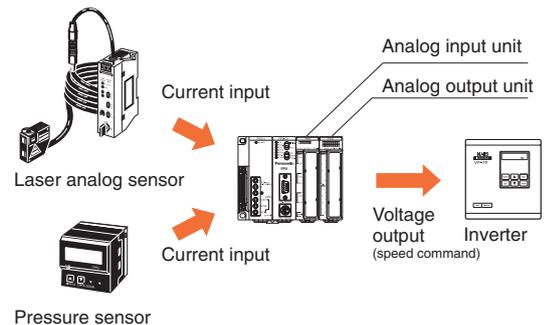
### 8 low costs inputs solely for voltage/current data

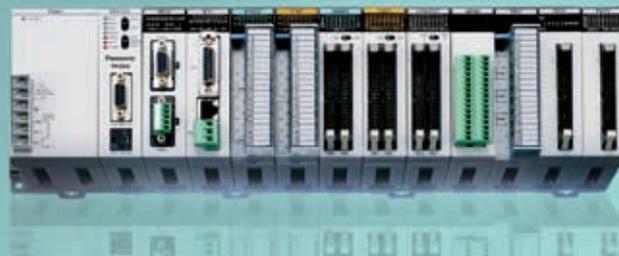| High-speed, high-accuracy |
| --- |
| Low cost unit for input of voltage/current data that indicates measurements of pressure, flow rate, fluid volume, speed, etc. |

FP2-AD8VI

### ■ Analog output unit

Supports multiple channels.
(Four channels per unit).

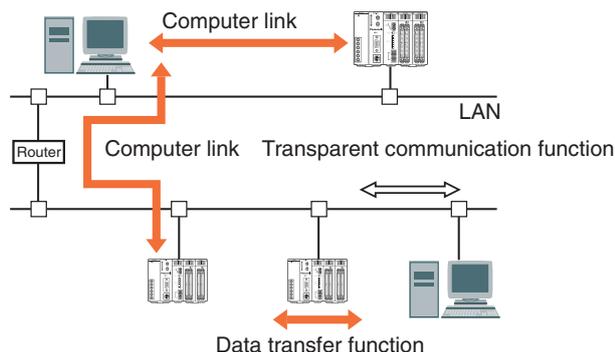| High-speed, high-accuracy |
| --- |
| Number of outputs: 4<br>Conversion speed: 500ms/ch<br>Overall accuracy: ±1.0% FS or less (0 to 55°C) |

FP2-DA4

# Networking

## Connect all PLCs with Each Other

**Support a wide variety of networks, such as open networks, PLC links, remote I/O systems, and S-LINK**

### ■ Open network

#### Ethernet

- ■ Supports three communication interfaces: 100BASE-TX, 10BASE-T, and 10BASE5.
- ■ Supports TCP/IP and UDP/IP.
- ■ Communication among a maximum of eight connections is available.
- ■ Compatible with user-friendly MEWTOCOL.
- ■ Supports remote programming.

Computer link

LAN

Router

Computer link    Transparent communication function
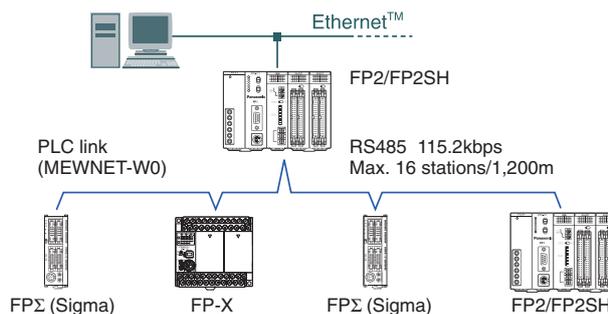
Data transfer function

FP2-ET1

### ■ PLC link

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

#### MEWNET-W0 mode

A PLC link of the compact high-performance PLC FPΣ (Sigma)* 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 FP2/FP2SH, FPΣ (Sigma) and FP-X units on a single network and contributes to significant cost reduction.

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

Ethernet™

FP2/FP2SH

PLC link
(MEWNET-W0)

RS485  115.2kbps
Max. 16 stations/1,200m

FPΣ (Sigma)        FP-X        FPΣ (Sigma)        FP2/FP2SH

\* Each FPΣ (Sigma) unit also requires an RS485 cassette (FPG-COM3 or FPG-COM4) to be attached.
\* Each FP-X unit requires that an AFPX-COM3 or AFPX-COM4 communication cassette is attached.

#### MEWNET-W2 mode

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

- ■ 500kbps transmission speed.
- ■ Transfer of data of 4096 points/4096 words is possible.
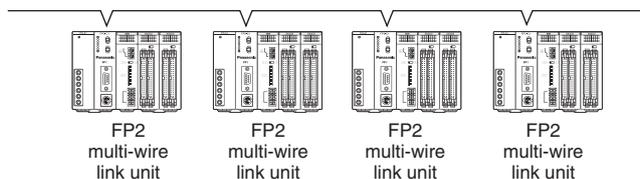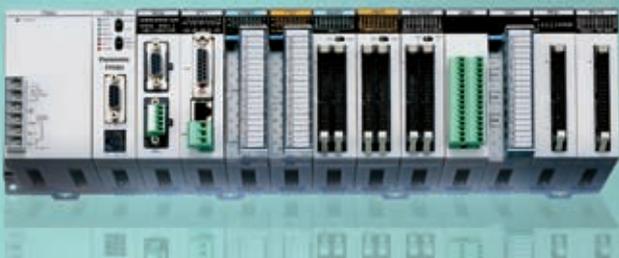- ■ Up to 32 units can be connected.
- ■ Extendable to 1,200m

FP2
multi-wire
link unit

FP2
multi-wire
link unit

FP2
multi-wire
link unit

FP2
multi-wire
link unit

# Flexible Network Slave Unit

## Continuous Communication in Industrial Applications

The Flexible Network Slave (FNS) unit is a powerful, modular network unit used together with the programmable controllers FP2 and FP2SH. By exchanging compact network blocks, you can connect to various networking systems without having to modify your entire hardware platform. The blocks are available for three bus systems: PROFIBUS, DeviceNet and CANopen. Others are planned for the future.

FP2-FNS

### 4 simple steps to setup your network

**1** Install the FP2 FNS expansion module on the backplane of your FP2 system. The number of units is restricted by the size of the FP2 backplane.

**2** Various types of plug-in network blocks can be mounted in the device at any phase between manufacturer and end customer without having to worry about special protective provisions.

**3** For each network type, ready-made function libraries for FPWIN Pro are available free of charge from the Panasonic Electric Works Europe AG Website (www.panasonic-electric-works.com) These libraries drastically shorten the time needed to develop your applications, and consequently save valuable human resource costs. They also include a complete online help file and programming examples.
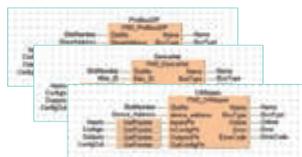
**4** Download the GSD or EDS files with the description of the device from the Panasonic Electric Works Europe AG Website.
The master unit requires these files to recognize the slave device characteristics.

### Advantages:
■ Wide range of connectivity solutions.
■ One PLC hardware platform for several bus systems.
■ Fast reaction to new market networking trends possible with existing units: no additional hardware development needed: you need only exchange the network block.
■ Extremely compact.

### PROFIBUS:
■ Automatic baud rate detection.
■ Transmission speed of 9.6kbps to 12Mbps.
■ Max. link area of 76 words (inputs and outputs).
■ Interface: DB9F (9-pin Sub-D female).

PROFIBUS
Plug-in module
AFPN-AB6200

### DeviceNet:
■ Automatic baud rate detection.
■ Transmission speed of 125kbps to 500kbps.
■ Max. link area of 128 words in each direction.
■ Interface: 5-pin terminal block.
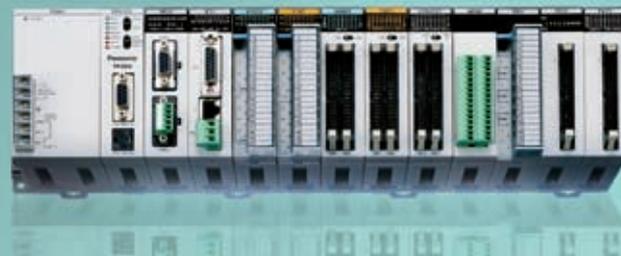
DeviceNet
Plug-in module
AFPN-AB6201

### CANopen:
■ Automatic baud rate detection.
■ Transmission speed of 10kbps to 1Mbps.
■ Max. link area of 128 words (for TPDOs and RPDOs).
■ Interface: 9-pin Sub-D mode

CANopen
Plug-in module
AFPN-AB6218

# FP Web-Server

## Program/Operate the PLC using an Ethernet Network

The multifunctional FP Web-Server provides users with the option of connecting any FP Series PLC to the Internet/Intranet for bi-directional communication via Ethernet. No changes to the PLC programs are necessary. Simply assign an IP address to the FP Web-Server and connect the PLC to the FP Web-Server via the serial RS232C interface. A standard browser, e.g. MS Internet Explorer, can be used for access at the PC. The Windows-based program FP Web Configurator Tool helps you easily set up and configure the FP Web-Server.

### The FP Web-Server´s 3 interfaces

100Base-TX / 10Base-T (RJ45, twisted pair)
– connects to the Ethernet at 100Mbit/s

RS232C (screw terminal)
– connects to the PLC at 1200 to 115.2kbit/s

RS232C (SUB-D 9 male)
– connects to a modem

FPWEB2

### FP Web-Server advantages
- Uses existing Intranet, saves wiring.
- Uses standard browser, saves Scada software.
- Remote control.
- Remote monitoring.
- Remote programming.
- Alarm information via e-mail.

## ■ Highlights

### Web-Server:
PLC data presented as HTML (or XML) pages
- Access via standard Internet browser.
- PLC data handling via HTML and Java Applet.
- Optional: Password protection, IP lock security.

### RS232C device server:
- Ethernet <-> RS232C conversion (MEWTOCOL).
- Transparent RS232C data tunneling via Ethernet.
- Programming and visualization via TCP or UDP.

### Modem dial-out / Internet system:
- FP Web-Server can dial-out to the Internet.
- Various Internet / GPRS system solutions.

### Modbus-TCP protocol:
- Communication via standard industrial Ethernet protocol (server and client).
- Gateway for Modbus-RTU units (master and slave).

### IEC 60870-5-101 and IEC 60870-5-104 protocol:
- Communication via RS232C, RS485 adapter, multipoint modem, dial-up modem, Ethernet.

### Network time server synchronization:
- PLC real-time clock update via NTP server.

### E-mail
- PLC can send e-mails.
- E-mail via LAN e-mail server or Internet dial-up.
- PLC-defined or pre-stored e-mail text.
- PLC data array as attachment to an e-mail.

### Modem dial-in / Ethernet gateway:
- FP Web-Server can be dialed up via modem.
- One remote gateway for multiple FP Web-Servers.

| Specifications | |
| --- | --- |
| Current consumption | 65mA |
| Operating voltage | 24VDC (10.8-26.4VDC) |
| Communication interfaces | RS232C for connection to a PLC, RS232C for modem connection, 100Base-TX/10Base-T, Ethernet |
| Communication protocol | MEWTOCOL, DNS, HTTP, SMTP, FTP TELNET, TCP/IP, UDP/IP, PPP, SNTP, Modbus |
| Safety | Passwords, IP lock |
| Ambient temp. | 0°C to 55°C |
| Storage temp. | -20°C to +70°C |
| Dimensions | 25W x 90H x 60D (mm) |
| Weight | 0.11kg |

# Remote I/O Systems
## Flexible Layout of I/O Devices

### ■ Remote I/O systems

**MEWNET-F mode**

The number of I/O points can be increased up to 8192 and the transmission distance can be extended up to 700m by using the multi-wire link units.

■ MEWNET-F is a remote I/O system that connects I/O units in separate locations with twisted-pair cables.

■ The remote I/O master unit serves as a master station. Slave stations can be selected from the units shown on the next page.

■ Up to four wiring routes are available, allowing for a flexible layout of slave stations.

■ 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.

**F mode**

Twisted-pair cables or VCTF cables

FP2 multi-wire
link unit (F mode)

FP I/O terminal
board

FP0
control
unit

FP0
I/O link
unit

FPΣ
control
unit

FP0
I/O link
unit

FP I/O terminal unit

Manifold
solenoid valve
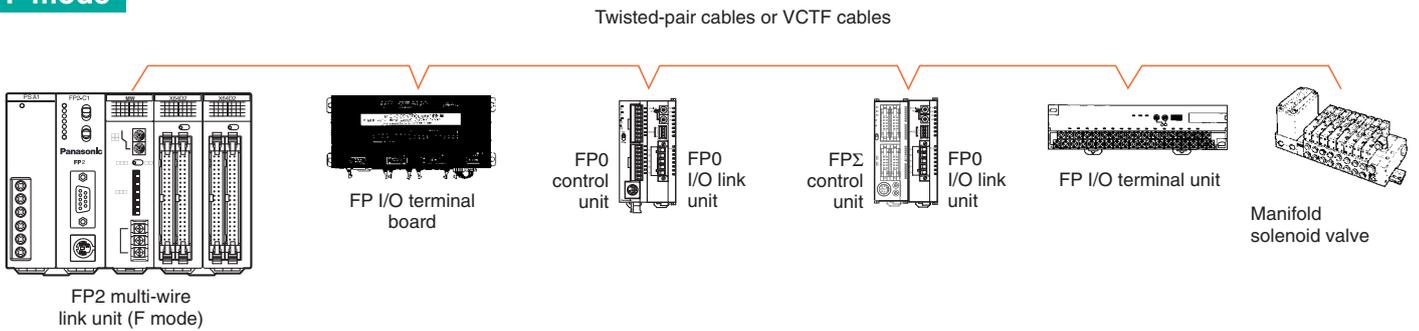
### ■ S-LINK

■ S-LINK is a link system that allows the free layout of I/O devices, such as sensors, by T-branch connections with a four-wire flat cable.

■ The number of I/O points can be increased up to 2048 in increments of one channel having 128 points.

■ A CPU unit with S-LINK ports and a single S-LINK unit are available. FP2-C1SL has two S-LINK ports and can control 256 I/O points.

FP2/FP2SH

FP2/FP2SH
S-LINK unit

S-LINK unit
FP2-SL2

S-LINK CPU unit
FP2-C1SL

Length: 200m max.
I/O points: 128 max.

T-branch
multi-drop
wiring

Two signal lines
Two power lines
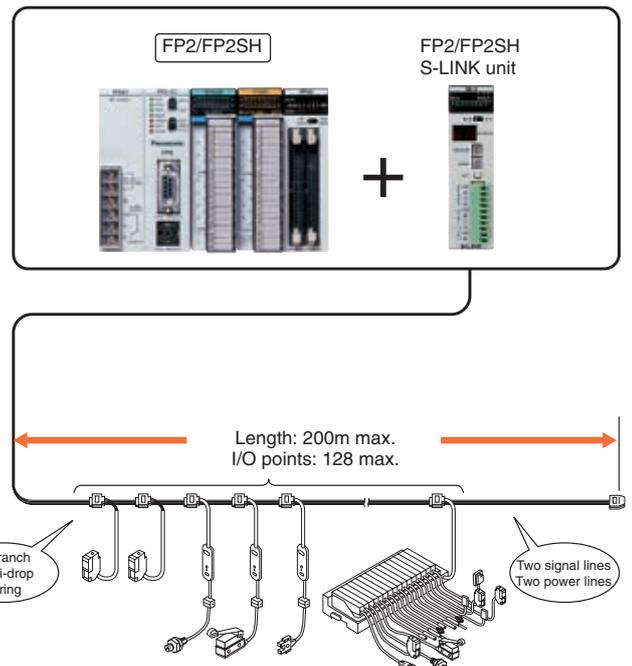
■ Sensors to be connected by S-LINK must be chosen from among S-LINK-compatible sensors manufactured by SUNX Limited.

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

# Serial Communication

## Connect to Various Serial Devices

### ■ Serial communication control

**The CPU units have an RS232C port as standard equipment. The communication unit enables connections with RS232C/RS485/ 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 a control panel or a computer

FP2

RS232C port

Host computer
(commercially available PC)

Display panel
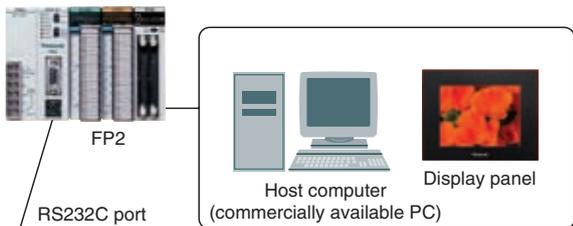
Remote monitoring via a modem

Modem      Public line      Modem

Commercially
available cable

Special cable available
from Panasonic

FP2
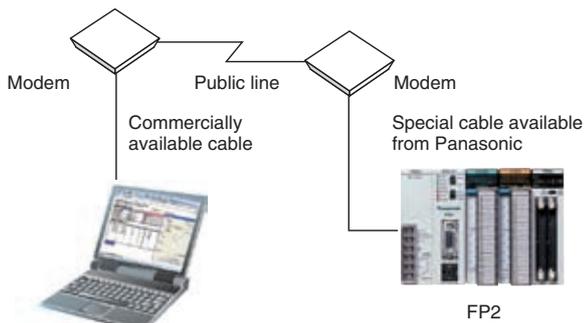
"PCWAY" for easy data collection
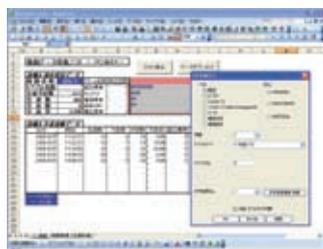
The operation data managing software "PCWAY" allows FP2/FP2SH operation data to be imported into Excel* without programming.
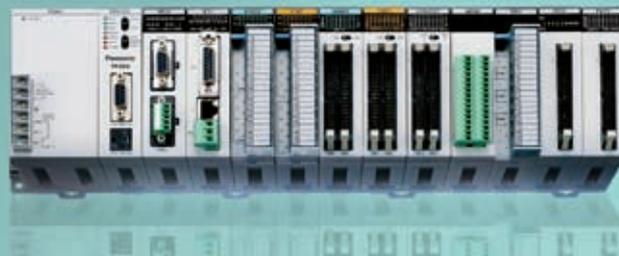
* Excel is a registered trademark of the Microsoft Corporation.

### ■ Multi-communication unit (MCU)

**The communication blocks are detachable**

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

FP2-MCU

*Industry's fastest level*

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

Three communication blocks available.

| RS232C | RS422 | RS485 |
|---|---|---|
| FP2-CB232 | FP2-CB422 | FP2-CB485 |

**The combination is selectable**

COM2 (the lower channel) is sealed before shipping to protect it from damage, e. g. if only COM1 is used.

Multi-communication unit FP2-MCU.

* This unit cannot operate without a communication block attached. Purchase the above communication block(s) together with this unit.
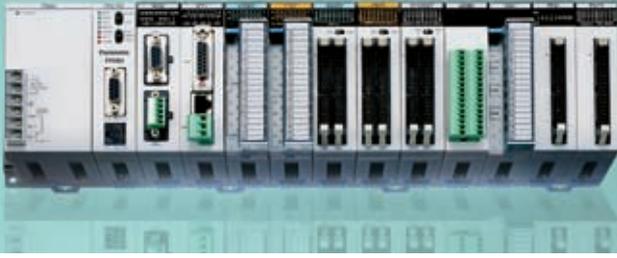
# FP2

## Basic CPUs

**The functions for a medium-scale PLC are squeezed into a compact body.
Perfect when combining various devices.**

### ■ Features

**1. Compact body**
The functions for a medium-scale PLC are squeezed into a compact body which requires minimal installation area (H: 100, W: 140, D: 108.3mm).

**2. Module specifications enable flexible design**
Backplanes for 5, 7, 9, 12, and 14 modules are available, and since the units have the same width, you can choose the most economical design for your application.

**3. RS232C port is standard**
RS232C port allows connection with operation display panels and host computers, as well as remote surveillance using modems, etc.

**4. Different memory options are available to meet your application**
Memory units for comment, calendar timer, expansion RAM, and ROM operation are available so you can add just the options you need.

**5. Dedicated instructions for high level data processing**
Real number data operation is naturally supported, which simplifies programming.

### ■ Power supply/I/O specifications

| Item | Description |
|---|---|
| Power supply | 100V to 120VAC / 200V to 240VAC / 100V to 240VAC, 24VDC (varies with different models) |
| Input | 12V to 24VDC, 24VDC ±common |
| Output | Relay 2A to 5A / Transistor 0.1A to 0.5A (varies with different models) |

### ■ Performance specifications

| Item | | Description |
|---|---|---|
| Number of I/O points | | Up to 768 points |
| Expansion | Standard | Up to 1 backplane Units: 25 max. I/O points: 1,600 max. Remote I/O points: 2,048 max. |
| | H type | Up to 3 backplanes Units: 32 max. I/O points: 2,048 max. Remote I/O points: 2,048 max. |
| Operation speed | | 0.35μs/step (Basic instuction) |
| Built-in memory | | RAM (ROM is optional) |
| Memory capacity | | Approx. 16k steps |
| Operation memory | Internal relay | 4048 points |
| | Timer/Counter (T/C) | 1024 points in total |
| | Data register | 6000 words |

### ■ Special functions

| Item | | Description |
|---|---|---|
| Analog I/O | | Available by adding analog input and analog output units |
| High-speed counter | | Available by adding high-speed counter unit (max. 200kHz) |
| Pulse output | | Positioning unit 2-axis Positioning unit 4-axis |
| Serial | RS232C port | Standard equipped with CPU unit Expandable by adding C.C.U., M.C.U. and serial data unit |
| | RS422 RS485 | Expandable by adding M.C.U. |
| Interrupt input | | Available by adding high-speed counter unit or pulse I/O unit |

### ■ Special network functions

| Item | Description |
|---|---|
| Remote I/O | S-LINK, MEWNET-F |
| PLC Link | MEWNET-W2 (Wire) MEWNET-W0 PROFIBUS, DeviceNet, CANopen |
| Computer Link | Linkable by using tool port or COM. port on CPU unit. Also available by adding M.C.U. and C.C.U. |
| Modem connection | Available |

### ■ Other built-in functions

| Item | Description |
|---|---|
| Program block-edit during RUN | Available |
| Constant scan | Available |
| Clock/Calendar function | Can be used with the addition of the calendar function option |

| Product numbers | |
|---|---|
| Standard Type CPU | FP2-C1 |
| CPU with 64points input | FP2-CS1D |
| CPU with S-LINK | FP2-C1SL |
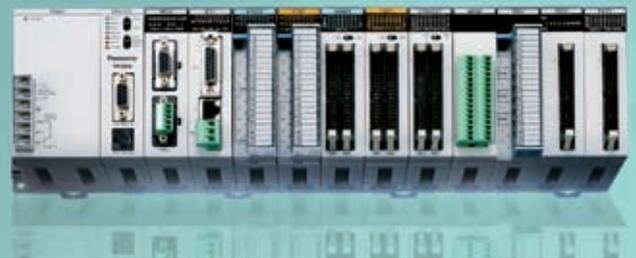
# FP2SH

## High-Performance CPUs

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

### ■ Features

**1. Scanning time of 1ms for 20k steps**
An operating speed at the top of its class enables high-speed processing and a dramatically decreased tact time.

**2. Large programming capacity of up to 120k steps**
60k and 120k programming capacities 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 great amounts of data to be processed.

**4. Built-in comment and calendar timer functions**
These functions, options with the FP2, are built right into the FP2SH.

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

### ■ Power supply/I/O specifications

| Item | Description |
|---|---|
| Power supply | 100V to 120VAC / 200V to 240VAC / 100V to 240VAC, 24VDC (varies with different models) |
| Input | 12V to 24VDC, 24VDC ±common |
| Output | Relay 2A to 5A / Transistor 0.1A to 0.5A (varies with different models) |

### ■ Performance specifications

| Item | | Description |
|---|---|---|
| Number of I/O points | | Up to 768 points |
| Expansion | Standard | Up to 1 backplane Units: 25 max. I/O points: 1,600 max. Remote I/O points: 8,192 max. |
| | H type | Up to 3 backplanes Units: 32 max. I/O points: 2,048 max. Remote I/O points: 8,192 max. |
| Operation speed | | 0.03μs/step (Basic instuction) |
| Built-in memory | | RAM (ROM/Small PC card is optional) |
| Memory capacity | | Approx. 60k steps/approx. 120k steps (varies with different models) |
| Operation memory | Internal relay | 14,192 points |
| | Timer/Counter (T/C) | 3072 points in total |
| | Data register | 10,240 words |
| | File register | 32,765 words x 3 banks |

### ■ Special functions

| Item | | Description |
|---|---|---|
| Analog I/O | | Available by adding analog input and analog output units |
| High-speed counter | | Available by adding high-speed counter unit (max. 200kHz) |
| Pulse output | | Positioning unit 2-axis Positioning unit 4-axis |
| Serial | RS232C port | Standard equipped with CPU unit Expandable by adding C.C.U., M.C.U. and serial data unit |
| | RS422 RS485 | Expandable by adding M.C.U. |
| Interrupt input | | Available by adding high-speed counter unit or pulse I/O unit |

### ■ Special network functions

| Item | Description |
|---|---|
| Remote I/O | S-LINK, MEWNET-F |
| PLC Link | MEWNET-W2 (Wire) MEWNET-W0 MEWNET-VE PROFIBUS DeviceNet CANopen |
| Computer Link | Linkable by using tool port or COM. port on CPU unit. Also available by adding M.C.U and C.C.U. |
| Modem connection | Available |

### ■ Other built-in functions

| Item | Description |
|---|---|
| Program block-edit during RUN | Available |
| Constant scan | Available |
| Clock/Calendar function | Built-in type |

| Product numbers | |
|---|---|
| Standard Type CPU (60k steps) | FP2-C2 |
| CPU for small PC card (60k steps) | FP2-C2P |
| CPU for small PC card (120k steps) | FP2-C3P |
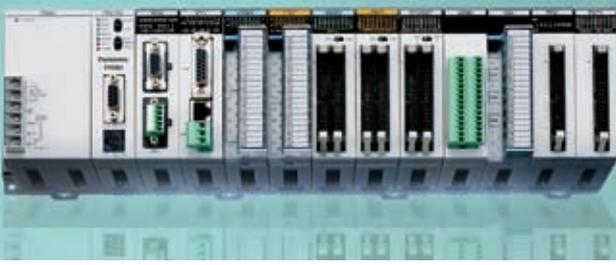
# FP2/FP2SH

## Product Line and Accessories

### ■ FP2/FP2SH system configurations and unit lineup

#### Unit combinations

■ Most units occupy one slot, i. e. module each, though some units occupy two slots.

■ When selecting a backplane, carefully consider the units and number of slots you need.

■ The power supply unit and CPU unit must be mounted on the CPU backplane.
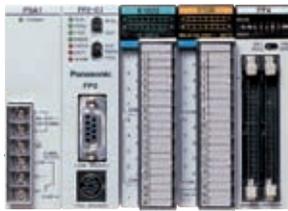
**Power supply units**

| 100VAC, 2.5A type FP2-PSA1 | 200VAC, 2.5A type FP2-PSA2 | 100 to 240VAC, 5A type FP2-PSA3 | 24VDC, 5A type FP2-PSD2 |

**Backplanes**

(For use as both master and expansion backplanes. The 5-module type cannot be used with or as an expansion backplane.)

5-module type
FP2-BP05

7-module type
FP2-BP07

9-module type
FP2-BP09

12-module type
FP2-BP12

14-module type
FP2-BP14

**H type backplanes**

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

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

■ Units that occupy two modules each

| Type | Model No. |
| --- | --- |
| Power supply unit, 5A type | FP2-PSA3 |
| | FP2-PSD2 |
| CPU unit with 64 input points | FP2-C1D |
| CPU unit with S-LINK ports | FP2-C1SL |

Expansion cable (60cm)
FP2-EC

Expansion cable (2m)
FP2-EC2

Dummy unit
FP2-DM

**CPU units**

**FP2**

| Standard type FP2-C1 | With 64-point input FP2-C1D | With S-LINK FP2-C1SL |

**FP2SH**

| Standard type (60k steps) FP2-C2 | For small PC card (60k steps) FP2-C2P | For small PC card (120k steps) FP2-C3P |

# FP2/FP2SH

## Product Line and Accessories

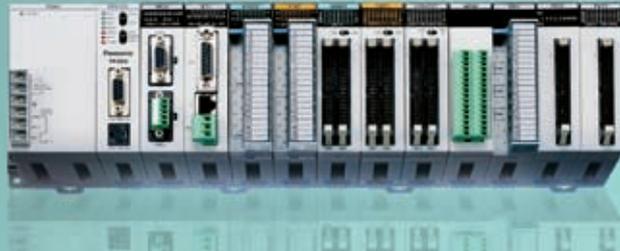- Except for the 5-module expansion backplane, or backplanes can be expanded.
- If the backplane is of the H type, up to three backplanes can be added.
- Most of the units can be used in any combination; however, some combinations are subject to constraints due to the unit type, current consumption, etc.

*Please contact us for details.*

### Input and output units

16-point DC input
FP2-X16D2
16-point NPN transistor output
FP2-Y16T
16-point PNP transistor output
FP2-Y16P
6-point Relay output (5A)
FP2-Y6R
16-point Relay output (2A)
FP2-Y16R

32-point DC input
FP2-X32D2
32-point NPN transistor output
FP2-Y32T
32-point PNP transistor output
FP2-Y32P

64-point DC input
FP2-X64D2
64-point NPN transistor output
FP2-Y64T
64-point PNP transistor output
FP2-Y64P
32-point input/32-point NPN output mixed
FP2-XY64D2T
FP2-XY64D7T
32-point input/32-point PNP output mixed
FP2-XY64D2P
FP2-XY64D7P

### Optional memories

#### For FP2

FP2-EM1
FP2-EM2

FP2-EM3
FP2-EM6
FP2-EM7

#### Type of memory unit

| | | | | |
|---|---|---|---|---|
| FP2-EM1 | A | A | N/A | N/A |
| FP2-EM2 | A | A | A | N/A |
| FP2-EM3 | A | A | A | A |
| FP2-EM6 | N/A | N/A | A | A |
| FP2-EM7 | N/A | N/A | N/A | A |

A: Available
N/A: Not available

F-ROM
FP2-EM4

EP-ROM
FP2-EM5

FP Memory Loader

Data clear/
Data hold type
AFP8670/
AFP8671

#### For FP2SH

Memory unit
with ROM socket
FP2-EM7 (AFP2207)

F-ROM
(AFP5208)

Small PC card (2MB)
F-ROM
(AIC50020)

Small PC card (2MB)
SRAM
(AIC52000)

EP-ROM
(AFP5209)

### Panasonic servo MINAS AII/S series

### Motor driver I/F terminal II

AFP8503
1-axis type

AFP8504
2-axis type

### Analog input/output units

Voltage/current
input unit
FP2-AD8VI

Multiple analog
input unit
FP2-AD8X

Resistance thermometer
device input unit
FP2-RTD

Analog output
unit
FP2-DA4

### Positioning units

NEW

Positioning units
RTEX
FP2-PN2AN
(2-axis)

NEW

Positioning units
RTEX
FP2-PN4AN
(4-axis)

NEW

Positioning units
RTEX
FP2-PN8AN
(8-axis)

Positioning units
FP2-PP21 FP2-PP22
(2-axis)

Positioning units
FP2-PP41 FP2-PP42
(4-axis)

### Pulse input/output units

High-speed counter
unit
FP2-HSCT FP2-HSCP

Pulse I/O
unit
FP2-PXYT FP2-PXYP

### Multi-communication unit

Multi-communication unit
FP2-MCU
The communication blocks
are available separately.

### Serial data control unit

Serial data unit
FP2-SDU

### Operation display panel and computer interface unit

Computer
communication unit
FP2-CCU

### Link-related units

ET-LAN
FP2-ET1

Multi-wire link unit
FP2-MW

S-LINK
FP2-SL2

Flexible Network Slave
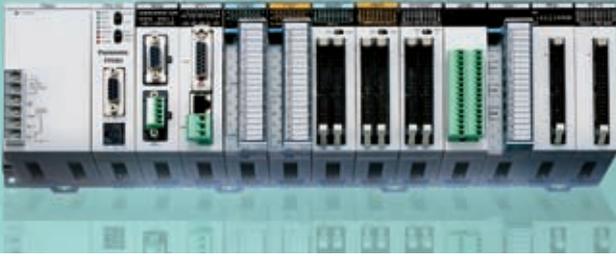FP2-FNS

# Control FPWIN Pro

## Programming According to the International Standard IEC 61131-3

FPWIN Pro is the Panasonic programming software developed according to the international standard IEC 61131-3 (for Windows 98, NT V4.0, 2000, ME, XP or Vista). This new version is a result of experience gained over many years. We were one of the first PLC manufacturers to offer an IEC 61131-3 programming software, and we are a leading member of the international organization PLCopen.

Multiple address assigment is caught automatically by the compiler

Type safe programming using simple or complex data types

Input and output variables are defined once in the global variable list

Comfortable programming in the graphical LD editor (ladder diagram)

Functions can be saved in libraries for future reuse

One instruction for different data types (overloaded instructions)

Navigator with tree representation of called functions provides an overview even for very complex projects

Long variable names make the program self-explanatory

The SFC editor (Sequential Function Chart) allows you to easily visualize processes

Additional window for monitoring and forcing variables

Special functions for controlling the SFC program from another program

Using alliases names for PLC-independent access on the special data registers, e.g. RTC

The ST editor (Structured Text) solves complex programming tasks

Structuring with selection statements

Using loops for running through incoming data

Using STRING functions for analyzing incoming data...

...or for generating formatted output strings

Easy handling of formulas and arithmetic expressions

FPWINPro full version supports all FP Series PLCs.

| Product numbers | |
|---|---|
| With English manual | FPWINPROFEN5 |
| With German manual | FPWINPROFDE5 |
| With French manual | FPWINPROFFR5 |

FPWINPro small version supports: FP-e, FP0, FP-X, FPΣ (Sigma)

| Product numbers | |
|---|---|
| With English manual | FPWINPROSEN5 |
| With German manual | FPWINPROSDE5 |
| With French manual | FPWINPROSFR5 |

## The most important highlights at a glance:

- One software for all FP Series PLCs.
- 5 programming languages (instruction list, ladder diagram, function block diagram, sequential function chart, structured text) available for all PLCs.
- Program organisation units, task and project management provide clear structure.
- Reuse of ready-made functions and function blocks saves time for programming and debugging.
- Online monitoring and diagnostics.
- Forcing – Turning off input and output contacts via the PC.
- Modem and Ethernet communication for remote programming, service and diagnostics.
- Extensive comments – online documentation created hand in hand with the program.
- 6 languages are supported: English, German, French, Italian, Spanish and Japanese.

**Free demonstration disc**
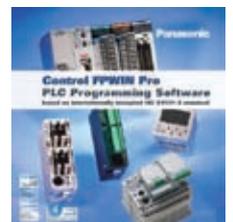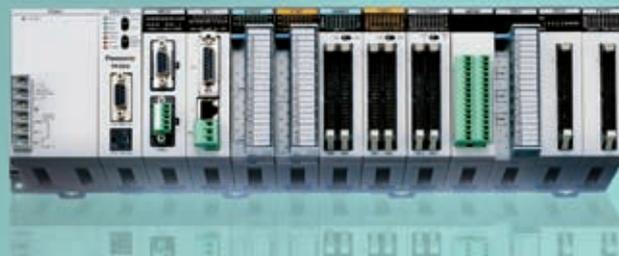
# Other software tools

## FP OPC Server and FP Data Analyzer

### ■ FP OPC Server

**Connects your favorite industrial application to FP2 or other FP Series PLCs**

The Panasonic FP OPC Server allows high-performance data transfer between applications supporting the universally accepted OPC PC DA Standard (v1-v3) and Panasonic FP Series PLCs. The FP OPC Server manages the device-specific communication and provides data via a standard interface. Thus OPC clients connected to the server can exchange information with FP2 or other FP Series PLCs.

### ■ Features of the FP OPC Server

■ Modern and intuitive user interface allows you to configure the server. While creating the application, sophisticated user assistance helps you in your work.

■ The server complies to the following OPC DA client/server technologies: OPC DA 1.0a, 2.05a and 3.0.

■ The PLCs can be accessed via serial, modem and Ethernet communication lines.

■ State-of-the-art import / export mechanism allows you to save, exchange or edit data in XML format. Data can also be exchanged using a CSV file.

■ An icon or tool tip notifies the user about possible errors in configuration.

■ The FP OPC Server allows you to clearly structure your application, e.g. by grouping elements in meaningful hierarchies.

■ Tolerant of interruptions due to optimized communication features.
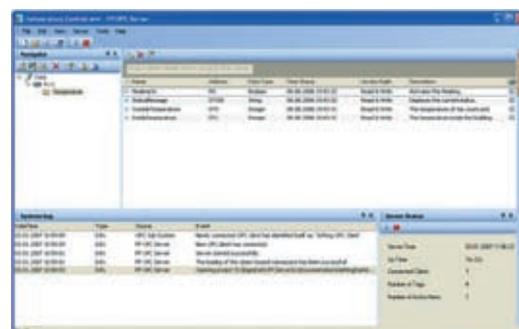


**FP OPC Server software with one license**
Product number: AFPS03510D
**FP OPC Server additional license**
Product number: AFPS03517D

### ■ FP Data Analyzer

The FP Data Analyzer is a software tool for acquisition, logic analysis and representation of recorded data on multiple channels connected to any Panasonic PLC. The software is a stand-alone tool. You need not install any other software to run the FP Data Analyzer.

The FP Data Analyzer can be connected to the FP2 by utilizing the integrated MEWNET Manager, for instance via the COM port. Recording and analyzing remote PLCs via LAN or modem is just a matter of seconds.

**The tool can be used for:**
■ Performing failure diagnostics.
■ Finding and isolating failures.
■ Performing analyses, system optimization.
■ Documenting processes.
■ Shortening the time between setup and operation.
■ Carrying out machine maintenance.
■ Improving development.
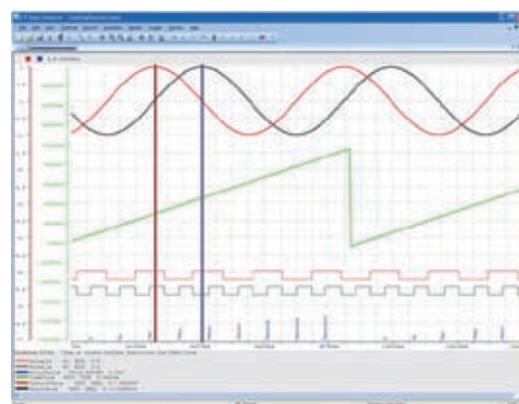


**FP Data Analyzer**
Product number: AFPS04510D

# FP2/FP2SH

## Specifications

### ■ CPU units

| Item | | FP2 CPU unit | FP2SH CPU unit | | |
|---|---|---|---|---|---|
| | | FP2-C1<br>FP2-C1D<br>FP2-C1SL | FP2-C2 | FP2-C2P | FP2-C3P |
| Operation speed | Basic | 0.35µs or more | 0.03µs or more | | |
| | High-level | 0.93µs or more | 0.06µs or more | | |
| Program capacity | Built-in RAM | 16k steps | 60k steps | | 120k steps |
| | With expansion | 32k steps | Not available | | Not available |
| Number of I/O points | No expansion — Conventional type | Max. 768 points | Max. 768 points | | |
| | No expansion — H type | Max. 512 points | Max. 512 points | | |
| | With expansion — Conventional type | Max. 1600 points | Max. 1600 points | | |
| | With expansion — H type | Max. 2048 points | Max. 2048 points | | |
| | With remote I/O | Max. 2048 points | Max. 8192 points | | |
| Operation memory | Internal relay | 4048 points | 14,192 points | | |
| | Data register | 6000 words | 10,240 words | | |
| | File register | 0 to 143,333 words<br>(w/expansion 0 to 30,717 words) | 32,765 words x 3 banks | | |
| | Link register | 256 words | 8448 words | | |
| Optional memory | | F-ROM/EP-ROM | F-ROM/EP-ROM | Small PC card (F-ROM/S-RAM) | |
| Comment memory | | Optional memory unit | Available | | |
| Clock/Calendar function | | Optional memory unit | Available | | |

### ■ Power supply units

| Item | | FP2-PSA1 | FP2-PSA2 | FP2-PSA3 | FP2-PSD2 |
|---|---|---|---|---|---|
| Input | Rated voltage | 100V - 120VAC | 200V - 240V | 100V - 240VAC | 24VDC |
| | Current consumption | 0.4A or less (at 100VAC) | 0.2A or less (at 200VAC) | 0.7A or less (at 100VAC)  0.4A or less (at 200VAC) | 2.5A or less |
| | Surge current | 40A or less (55°C) | | 30A or less (25°C) | 10A or less |
| | Rated frequency | 47Hz ~ 63Hz | | | – |
| | Operating | 85 to 132VAC | 170 to 264VAC | 85 to 264VAC | 20.4 to 31.2VDC note) |
| Output | Voltage range | 2.5A max. | | 5A max. | |
| Alarm contact capacity | | 30VDC 1A | | | |
| Alarm contact operation | | When the ALARM LED of CPU unit is lit | | | |
| Alarm contact type | | 1c contact | | | |
| Leakage current | | Between input and ground terminals, 0.75mA or less | | | |
| Breakdown voltage | | 1500VAC for 1 minute (between input and ground terminals) | | | |
| Insulation resistance | | 100 MΩ 500VDC (between input and ground terminals) | | | |
| Guaranteed lifetime | | 20,000 hours at 55°C | | | |
| Overcurrent protection function | | Built-in overcurrent protection | | | |
| Fuse | | Built-in type | | | |
| Terminal screw | | M3 | | | |
| Module size | | 1 modul | 1 modul | 2 module | 2 module |

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 100ms or more.
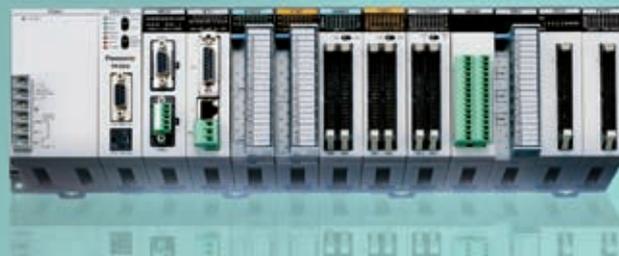
# FP2/FP2SH

## Specifications

### ■ Input units

| Item | DC input unit | | | I/O mixed unit (input side) | |
|---|---|---|---|---|---|
| | 16-point DC input type | 32-point DC input type | 64-point DC input type [1] | DC input type/Transistor output (NPN) type [2] | DC input type/Transistor output (PNP) type [3] |
| | FP2-X16D2 | FP2-X32D2 | FP2-X64D2 | FP2-XY64D2T | FP2-XY64D2P |
| Rated input voltage | 12 - 24VDC | 24VDC | 24VDC | 24VDC | 24VDC |
| Rated input current | Approx. 8mA (at 24VDC) | Approx. 4.3mA (at 24VDC) | Approx. 4.3mA (at 24VDC) | Approx. 4.3mA (at 24VDC) | Approx. 4.3mA (at 24VDC) |
| Input impedance | Approx. 3kΩ | Approx. 5.6kΩ | Approx. 5.6kΩ | Approx. 5.6kΩ | Approx. 5.6kΩ |
| Min. ON voltage/Min. ON current | 9.6V/4mA | 19.2V/4mA | 19.2V/4mA | 19.2V/4mA | 19.2V/4mA |
| Max. OFF voltage/Max. OFF current | 2.5V/1mA | 5.0V/1.5mA | 5.0V/1.5mA | 5.0V/1.5mA | 5.0V/1.5mA |
| Response time OFF→ON | 0.2ms or less | 0.2ms or less | 0.2ms or less | 0.2ms or less | 0.2ms or less |
| Response time ON→OFF | 0.2ms or less | 0.3ms or less | 0.3ms or less | 0.3ms or less | 0.3ms 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) | One 40-pin connector | Two 40-pin connectors | Two 40-pin connectors | Two 40-pin connectors |

Notes: The number of ON points that can be actuated simultaneously is limited by the input voltage and the ambient temperature.
1) The specifications also apply to the input side of the CPU unit with 64 input points "FP2-C1D".
2) The specifications also apply to the DC-input, transistor-output (NPN) type I/O-mixed unit with ON pulse catch input "FP2-XY64D7T".
However, the response time is as follows: OFF→ ON: 0.2ms or less (X0-X1F); ON→ OFF: 0.3ms or less (X0-X1B), 1.0 to 5.0ms (X1C-X1F)
3) The specifications also apply to the DC-input, transistor-output (PNP) type I/O-mixed unit with ON pulse catch input "FP2-XY64D7P".
However, the response time is as follows: OFF→ ON: 0.2ms or less (X0-X1F); ON→ OFF: 0.3ms or less (X0-X1B), 1.0 to 5.0ms (X1C-X1F)

### ■ Output units

| Item | Relay output unit | | Transistor output unit | | | | | | I/O mixed unit (output side) [note 3) and 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 | FP2-Y16R | FP2-Y16T | FP2-Y16P | FP2-Y32T | FP2-Y32P | FP2-Y64T | FP2-Y64P | FP2-XY64D2T | FP2-XY64D2P |
| Rated control capacity | 5A 250VAC (10A/common) 5A 30VDC (10A/common) Min. load: 100mA 10V (resistor load) | 2A 250VAC (5A/common) 2A 30VDC (5A/common) Min. load: 100μA 10V (resistor load) | – | – | – | – | – | – | – | – |
| Rated load voltage | – | – | 5-24VDC | 5-24VDC | 5-24VDC | 5-24VDC | 5-24VDC | 5-24VDC | 5-24VDC | 5-24VDC |
| Max. load current | – | – | 0.5A (at 12 to 24VDC) 0.1A (at 5VDC) | 0.5A (at 12 to 24VDC) 0.1A (at 5VDC) | 0.1A (at 12 to 24VDC) 50mA (at 5VDC) | 0.1A (at 12 to 24VDC) 50mA (at 5VDC) | 0.1A (at 12 to 24VDC) 50mA (at 5VDC) | 0.1A (at 12 to 24VDC) 50mA (at 5VDC) | 0.1A (at 12 to 24VDC) 50mA (at 5VDC) | 0.1A (at 12 to 24VDC) 50mA (at 5VDC) |
| Max. surge current | – | – | 3A 10ms or less | 3A 10ms or less | 0.3A | 0.3A | 0.3A | 0.3A | 0.3A | 0.3A |
| OFF state leakage current | – | – | 1μA or less | 1μA or less | 1μA or less | 1μA or less | 1μA or less | 1μA or less | 1μA or less | 1μA or less |
| ON state maximum voltage drop | – | – | 0.5V or less | 0.5V or less | 1V or less (at 6 to 26.4VDC) 0.5V or less (at 6VDC or less) | 1.5V or less (at 6 to 26.4VDC) 0.5V or less (at 6VDC or less) | 1V or less (at 6 to 26.4VDC) 0.5V or less (at 6VDC or less) | 1.5V or less (at 6 to 26.4VDC) 0.5V or less (at 6VDC or less) | 1V or less (at 6 to 26.4VDC) 0.5V or less (at 6VDC or less) | 1.5V or less (at 6 to 26.4VDC) 0.5V or less (at 6VDC or less) |
| Repose time OFF→ON | 10ms or less | 10ms or less | 0.1ms or less | 0.1ms or less | 0.1ms or less | 0.1ms or less | 0.1ms or less | 0.1ms or less | 0.1ms or less | 0.1ms or less |
| Repose time ON→OFF | 8ms or less | 8ms or less | 0.3ms or less | 0.3ms or less | 0.3ms or less | 0.3ms or less | 0.3ms or less | 0.3ms or less | 0.3ms or less | 0.3ms or less |
| Power supply for driving internal circuit Voltage | 24VDC±10% (21.6V to 26.4VDC) | 24VDC±10% (21.6V to 26.4VDC) | 4.75 to 26.4VDC | 4.75 to 26.4VDC | 4.75 to 26.4VDC | 4.75 to 26.4VDC | 4.75 to 26.4VDC | 4.75 to 26.4VDC | 4.75 to 26.4VDC | 4.75 to 26.4VDC |
| Power supply for driving internal circuit Current | 70mA or less | 160mA or less | 120mA or less (at 24VDC) | 70mA or less (at 24VDC) | 140mA or less (at 24VDC) | 150mA or less (at 24VDC) | 250mA or less (at 24VDC) | 270mA or less (at 24VDC) | 120mA or less (at 24 VDC) | 130mA or less (at 24 VDC) |
| 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) | One 40-pin connector | One 40-pin connector | Two 40-pin connectors | Two 40-pin connectors | Two 40-pin connectors | Two 40-pin connectors |

Notes: The number of ON points that can be actuated simultaneously is limited by the input voltage and the ambient temperature.
The maximum load current is limited by the external power supply voltage.
1) The current capacity of each common terminal is 5A max.
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".
4) The specifications also apply to the DC-input, transistor-output (PNP) type I/O-mixed unit with ON pulse catch input "FP2-XY64D7P".
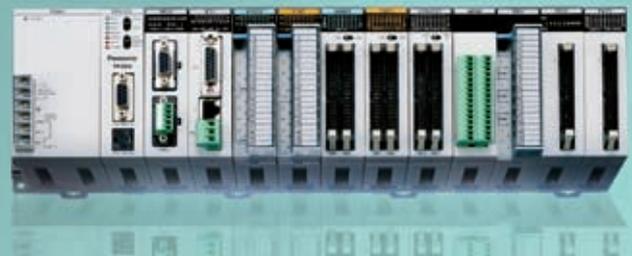
# FP2/FP2SH

## Specifications

### ■ Analog I/O units

#### 1. Analog input

| Item | | FP2-AD8X | FP2-RTD | FP2-AD8VI |
|---|---|---|---|---|
| Number of input points | | 8 channels | 8 channels | 8 channels |
| Input range (resolution) | Voltage | ±10V (1/65536) | – | ±10V (1/65536) |
| | | 1V ± 5V (1/13107) | – | 1V to 5V (1/13107) |
| | | ±100mV (1/65536) | – | – |
| | Current | – note1) | – | ±20mA (1/32768) |
| | | | | 4mA to 20mA (1/13107) |
| | Thermocouple | S: 0 to +1500°C (0.1°C) | | – |
| | | J: -200 to +750°C (0.1°C) | | |
| | | J: -100 to +400°C (0.1°C) | | |
| | | K: -200 to +1200°C (0.1°C) | – | |
| | | K: -200 to +1000°C (0.1°C) | | |
| | | K: -200 to +600°C (0.1°C) | | |
| | | T: -200 to +350°C (0.1°C) | | |
| | | R: 0 to +1500°C (0.1°C) | | |
| | | N: -200 to +1300°C (0.1°C) | | |
| | R.T.D | Pt 100 : -200 to +650°C (0.1°C) | | |
| | | Pt 100 : -100 to +200°C (0.1°C) | | |
| | | JPt 100 : -200 to +650°C (0.1°C) | | |
| | | JPt 100 : -100 to +200°C (0.1°C) | | |
| | | JPt1000 : -100 to +100°C (0.1°C) | | |
| Conversion speed | Voltage | 500μs/ch (insulated), 5ms (insulated) | – | 500μs/ch |
| | Current | – | – | 500μs/ch |
| | Thermocouple | 20ms/ch | – | – |
| | R.T.D | 20ms/ch | 20ms/ch | |
| Overall accuracy | | Voltage: ±0.1% FS (25 °C) Voltage temperature coefficient: ±0.3% (0 to 55 °C) | ±0.3% F.S. (0 to 55°C) | ±1.0% F.S. (0 to 55°C) |
| Insulation method | | Between the input terminal and FP2 internal circuits: Photocoupler and DC/DC converter | | Between the input terminal and FP2 internal circuits: Photocoupler |
| | | Between channels: PhotoMOS relay | – | – |
| Digital output | Averaging | Selectable from 3 to 64 times for each channel (Moving average after cutting the maximum and minimum values) | | |
| | Offset setting | Selectable from K -2048 to +2047 for each channel | | |
| Broken wire sensing | | Each channel (only when a thermocouple or RTD is inputted) | Each channel | – |
| Input range change method | | Batch switching of all channels: By the range setting switch | | |
| | | Each channels: By shared memory setting | | |

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

#### 2. Analog output

| Item | | Analog output unit FP2-DA4 |
|---|---|---|
| Number of output points | | 4 channels |
| Output range (digital input) | Voltage | ±10V (K-2048 to K+2047) |
| | Current | 0 to 20mA (K0 to K4095) |
| Resolution | | 1/4096 |
| Conversion speed | | 500μs/ch |
| Overall accuracy | | ±1.0% F.S. or less (0 to 55°C) |
| Insulation method | | – Between the output terminal and FP2 internal circuits: Photocoupler – Between channels: No insulation |
| Analog output | | Hold/Non-hold setting by shared memory setting |

## Specifications

### ■ ET-LAN units

● Performance Specification

| Item | | Specifications |
|---|---|---|
| Communications function | | - MEWTOCOL-COM: computer link function (max. 2KB)<br>- MEWTOCOL-DAT: data transfer (max. 1020 words)<br>- Transparent communication |
| Number of communication connections | | 8 connections max. |
| 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 [1] | 100BASE-T [1] | 100BASE5 |
|---|---|---|---|
| Transmission speed | 100Mbit/s | 10Mbit/s | 10Mbit/s |
| Transmission method | Base band | Base band | Base band |
| Max. segment length | 100m [note 2] | 100m [note 2] | 500m |
| Max. distance between nodes | 205m (2 segments) | 500m (5 segments) | 2500m (5 segments) |
| Communication cable or connection | Category 5 UTP cable | Category 3, 4 and 5 UTP cable | Transceiver cable |
| Max. transceiver cable length | – | – | 50m [note 3] |
| Max. number of nodes | – | – | 100 nodes/segment |
| Node spacing | – | – | Integer multiples of 2.5m |

Notes: 1) Switching between 100BASE-TX and 10BASE-T is done automatically by auto negotiation function.
2) The standards cite 100m 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 10m or less.
3) The standards cite 50m 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 transceiver is positioned close to a control board, we recommend using it at a distance of 5m or less.

### ■ Multi-communication units

| Item | General-purpose serial communications | | Computer link [1]<br>(Panasonic open protocol "MEWTOCOL" should be used.) | | PLC link function |
|---|---|---|---|---|---|
| | 1:1 communications | 1:N communications | 1:1 communications | 1:N communications | |
| Communication block used | FP2-CB232<br>FP2-CB422 | FP2-CB485 | FP2-CB232<br>FP2-CB422 | FP2-CB485 | FP2-CB232<br>FP2-CB422 |
| Interface | RS232C  RS422 | RS485 | RS232C  RS422 | RS485 | RS232C  RS485 |
| Communication method | Full duplex | Two-wire half duplex | Full duplex | Two-wire half duplex | Token passing<br>(Floating master) |
| Synchronization | Start-stop synchronization | | | | |
| Transmission line | Three-core or<br>five-core shielded wire | Twisted-pair cable<br>or VCTF | Three-core or<br>five-core shielded wire | Twisted-pair cable<br>or VCTF | Twisted-pair cable<br>or VCTF |
| Transmission distance | 15m  Length: 1200m max. | Length: 1200m max. | 15m  Length: 1200m max. | Length: 1200m max. | 1200m (RS485)  15m (RS232C) |
| Transmission speed<br>(To be set in the system register) | 300 to 230,400bps | 300 to 230,400bps<br>(19,200 bps when our C-NET adapter is connected) | 300 to 230,400bps | 300 to 230,400bps<br>(19,200 bps when our C-NET adapter is connected) | 115,200bps |
| Transmission code | ASCII, JIS7, JIS8, and binary | | ASCII, JIS7, JIS8 | | – |
| Transmission format<br>(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 | – | 99 stations max.<br>(32 stations max. when our C-NET adapter is connected) | – | 99 stations max.<br>(32 stations max. when our C-NET adapter is connected) | 16 stations max. |
| PLC link capacity | – | – | – | – | Link relay: 1024 points<br>Link register: 128 words |
| COM1 (upper channel) | A | A | A | A | A |
| COM2 (lower channel) | A | A | A | A | N/A |
| Number of attachable units | 23 units max. (including 8 units for the computer link and 2 channels for the PLC link) | | | | |
| Supported versions | CPU unit (both FP2 and FP2SH): 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: www.panasonic-electric-works.com

A: Available
N/A: Not available
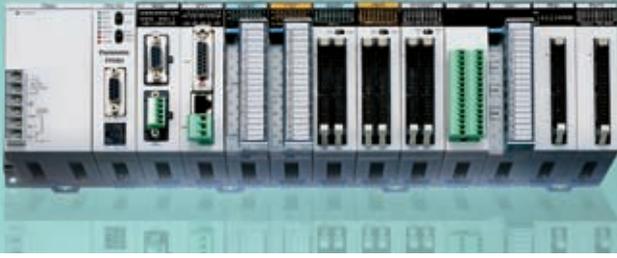
# FP2/FP2SH

## Specifications

### ■ Multi-wire link units

| Item | FP2-MW | | |
|---|---|---|---|
| Mode | W mode | W2 mode [1] | F mode |
| Communication method | Token bus | | Polling |
| Transmission method | Base band | | |
| Transmission speed | 500kbit/s | 500kbit/s, 250kbit/s | 500kbit/s |
| Transmission distance | Extendable to 800m | Extendable to 800m 250kbits/s: 1200m max. 500kbits/s: 800m max. | Extendable to 700m |
| Number of connectable stations | 32 stations max. | | 1 master + 32 slave stations max. |
| Transmission error check | CRC (cyclic redundancy check) system | | |
| Synchronization | Start-stop synchronization | | |
| Interface | RS485 compatible | | |
| Transmission line | Twisted-pair cable | | Twisted-pair cables or VCTF cables |
| RAS function | Hardware self-diagnosis function | | |

Note 1: When the unit is used in W2 mode, it must be set by user programs.

### ■ Positioning units: RTEX (Network type)

**NEW!**

<table>
<tr><td colspan="2">Item</td><td>2-axis type</td><td>4-axis type</td><td>8-axis type</td></tr>
<tr><td colspan="2">Product number</td><td>FP2-PN2AN</td><td>FP2-PN4AN</td><td>FP2-PN8AN</td></tr>
<tr><td rowspan="20">Unit specifications</td><td colspan="4"></td></tr>
<tr><td>Control method</td><td colspan="3">PTP control, continuous path (CP) control</td></tr>
<tr><td>Interpolation control</td><td colspan="3">Two/Three-axis linear interpolation, two-axis circular interpolation, three-axis helical interpolation</td></tr>
<tr><td>Unit of control</td><td colspan="3">Pulse/μm/inch/degree</td></tr>
<tr><td>Positioning data</td><td colspan="3">600 points per axis</td></tr>
<tr><td>Backup</td><td colspan="3">Parameters and data tables can be saved in FROM</td></tr>
<tr><td>Acceleration/ deceleration method</td><td colspan="3">Linear/S-curve acceleration and deceleration</td></tr>
<tr><td>Acceleration/ deceleration time</td><td colspan="3">0 to 10,000ms (in increments of 1ms)</td></tr>
<tr><td>Positioning range</td><td colspan="3">(-1073741823 to +1073741823 pulses) Increment/Absolute specification</td></tr>
<tr><td>Speed control function</td><td colspan="3">Supported by a JOG operation (free-run operation)</td></tr>
<tr><td>Torque control function</td><td colspan="3">Supported by a real-time torque control function</td></tr>
<tr><td>Search method</td><td colspan="3">Home proximity (DOG) search</td></tr>
<tr><td>Creep rate</td><td colspan="3">Can be set freely</td></tr>
<tr><td>Others</td><td colspan="3">Pulser input operation supported</td></tr>
<tr><td></td><td colspan="3">Auxiliary output code and auxiliary output contact</td></tr>
<tr><td></td><td colspan="3">Dwell time</td></tr>
<tr><td></td><td colspan="3">In-position contact</td></tr>
</table>

Position control function / Home return are row labels within Unit specifications.

| Communication specifications | | | | |
|---|---|---|---|---|
| Communication speed | 100Mbps | | | |
| Cables | Commercially available LAN straight cable (Category 5e shielded cable) | | | |
| Connection system | Ring | | | |
| Communication cycle/ Number of connectable stations | 0.5ms, 8 axes max./system (Command cycle: 1ms) | | | |
| Transmission distance | Between terminals: 60m Total: 200m | | | |

### ■ S-LINK units

| Item | S-LINK units FP2-SL2 | CPU unit with S-LINK ports FP2-C1SL |
|---|---|---|
| Number of channels | 1 | 2 |
| Number of I/O points | 128 points max. | 128 points max. × 2 |
| | The number of input and output points for each channel can be selected by the switch in the unit body Input: 0/32/64/96/128 points Output: 0/32/64/96/128 points | |
| Rated power supply voltage | +24VDC ±10% Maximum allowable ripples (P-P): ±10% (S-LINK terminal block IN-24VDC 1.6 A or less) | |
| Power consumption [1] | [Current consumption of the S-LINK controller (incl. D-G line current consumption)] +24VDC 1.6A or less [Maximum allowable current supply (Supply to the S-LINK and I/O devices through the 24V - 0V line)] +24VDC 5A (Fuse: 5A or less) | |
| Transmission method | Bi-directional time division multiplex transmission | |
| Synchronization | Bit/Frame synchronization | |
| Transmission protocol | S-LINK protocol | |
| Transmission speed | 28.5kbit/s | |
| Transmission distance [2] | Main signal line: Extendable to 200m (max. 400m when a booster is used) | |
| FAN-OUT [2] | 320 | |
| Connection method | T-branch multi-drop wiring or standard multi-drop wiring [+24, 0V, D-G (with a function of D-G short-circuit protection)] | |

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

### ■ FNS (Flexible Network Slave) specifications:

| Item | PROFIBUS | DeviceNet | CANopen |
|---|---|---|---|
| Baud rate | • Automatic baud rate detection • 9.6 kbaud to 12Mbaud | • Automatic baud rate detection • 125kbps to 500kbps | • Automatic baud rate detection • 10kbps to 1Mbps |
| Isolation | Galvanically isolated bus electronics | Galvanically isolated bus electronics | Galvanically isolated bus electronics |
| Connection types | DP-V0: process data is accessed from the PROFIBUS network as cylical I/O data | • Cyclic connections • COS (Change of State) • Bit strobe connections • Polled connections • Explicit connections | PDO (Process Data Object) Exchange via: • Cyclic Synchronous • Acyclic Synchronous • COS • Timer-driven connections |
| Maximum inputs / outputs | 76 words altogether for inputs and outputs (in units of 1, 2 or 4 words) | E. g. for cyclic connections: 128 words in each direction | Data 128 words (for TPDOs and RPDOs) |
| Additional features | Diagnostic support | • UCMM capable • CIP parameter object • Diagnostic support | Diagnostic support |
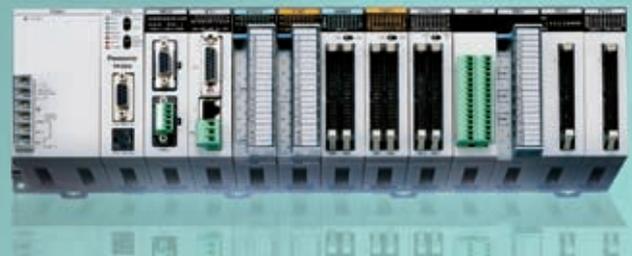
# FP2/FP2SH

## Specifications

### ■ Positioning units: multifunction type (pulse output type)

| Item | | 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 unit (the program specifies whether Increment or Absolute is used.) | | | |
| | Max. pulse count | Signed 32 bits (−2147483648 to +2147483647 pulses) | | | |
| Speed command | Command range | 1pps to 500kpps (can set in 1pps) | | 1pps to 4Mpps (can set in 1pps) | |
| Acceleration/ deceleration command | Acceleration/ deceleration | Linear acceleration/deceleration, S acceleration/deceleration (this takes the form of an "S") | | | |
| | "S" Acceleration/ deceleration | Can select from Sin curve, Secondary curve, Cycloid curve and Third curve | | | |
| | Acceleration/ deceleration time | 0 to 32,767ms (can set in 1ms) | | | |
| Home return | Home return speed | Speed setting possible (changes return speed and search speed) | | | |
| | Input terminals | Home input, Near home input, Over limit input (+), Over limit input (−) | | | |
| | Output terminals | Deviation counter clear output signal | | | |
| Operation mode | | • E point control (Linear and S accelerations/decelerations selecting possible) • P point control (Linear and S accelerations/decelerations selecting possible) • Home return function (Home search) • JOG operation function • JOG positioning function • Pulser input function Transfer multiplication ratio (×1, ×2, ×5, ×10, ×50, ×100, ×500, ×1000 selecting possible) • Real-time frequency change function • Infinity output function | | | |
| Startup time | | 0.02ms or 0.005ms possible | | | |
| Output interface | Output mode | 1 pulse output (Pulse/Sign), 2 pulse output (CW/CCW) | | | |
| Feedback counter | Countable range | Signed 32-bit (−2147483648 to +2147483647 pulse) | | | |
| | Input mode | 2-phase input*, Direction distinction input, Individual input (transfer multiple available for each) | | | |
| Other functions | | The flag to compare the elapsed value is built-in (The timing signal outputs at the optional position during an operation) | | | |
| Internal current consumption (at 5 VDC) | | 200mA max. | 350mA max. | 200mA max. | 350mA max. |
| External power supply | Voltage | 21.6VDC to 26.4VDC | | | |
| | Current consumption | 50mA | 90mA | 50mA | 90mA |

Notes: Previous FP2 positioning units FP2-PP2 and FP2-PP4 are not compatible with the multi-function type FP2 positioning unit. Please contact us.
* 2-phase input cannot be used with multiples of one.

### ■ High-speed counter units and pulse I/O units

| Item | | FP2 High-speed counter unit | FP2 Pulse I/O unit |
|---|---|---|---|
| Product number | | FP2-HSCT (NPN) FP2-HSCP (PNP) | FP2-PXYT (NPN) |
| Part no. | Insulation method | Photocoupler insulation | |
| | Rated voltage | 24VDC | |
| | Rated current | Approx. 7.5mA (when using 24VDC) | |
| | Input impedance | Approx. 3.2kΩ | |
| | Usage voltage range | 20.4VDC to 26.4VDC | |
| | Min. ON voltage/Min. ON current | 19.2V /6mA | |
| | Min. OFFvoltage/Min. OFFcurrent | 5.0V /1.5mA | |
| | Response time [1] OFF→ON | 1μs or less | |
| | ON→OFF | 2μs or less | |
| | Input time constant setting | None, 4μs, 8μs, 16μs, 32μs (set in 2-input units) | |
| | Common method | 16 points/common (+ common) | |
| Counter | Number of counter channels | 4 channels | |
| | Calculation range | 32-bit with sign (−2147483648 to +2147483647) | |
| | Max. calculation speed [1] | 200kHz | |
| | Input modes | 3 modes (direction control, individual input, phase input) | |
| | Max. calculation speed [1] | 2.5μs | |
| | Other | 8 comparison outputs, multiplier function (1, 2, 4) | |
| Interrupt | Number of interrupt points [2] | None, 1/unit, 8/unit (set with mode setting switches) | |
| | Interrupt processing delays | 160μs max. (when using FP2 CPU unit) 50μs max. (when using FP2SH CPU unit) | |
| Output specifi-cations | Insulation method | Photocoupler insulation | |
| | Rated load voltage | 5 to 24VDC | |
| | Rated load voltage range | 4.75VDC to 26.4VDC | |
| | Max. load current | 0.1A (A11 to A18, B11 to B14 pins), 0.8A (B15 to B18 pins) | |
| | Leakage current when off | 1μA max. | |
| | Max. voltage drop when on | 0.5V max. | |
| | Response time OFF→ON | 1μs max. | |
| | ON→OFF | 1μs or less (NPN) | |
| | | 5μs or less (PNP) | |
| | Surge absorber | Zener diode | |
| | Common method | 16 points/common | |
| | External power supply Voltage | 20.4VDC to 26.4VDC | |
| | Current (when using 24VDC) | 90mA or less (NPN) | |
| | | 200mA or less (PNP) | |
| Counter | Surge absorber | 8 points (A11 to A18 pins) | |
| Pulse output | Channels | | 4CH (B11 to B18 pins) |
| | Max. output frequency | | 100kHz |
| | Output modes | | 2 modes (direction control, individual output) |
| PWM output | Number of output points | − | 4CH (B15 to B18 pins) |
| | Max. load current | | 0.8A |
| | Cycle [3] | | 1Hz to 30kHz |
| | Duty [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/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.
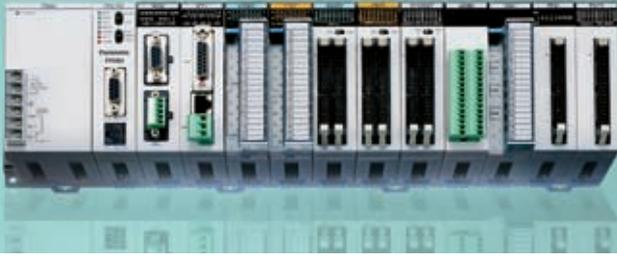
# FP2/FP2SH

## Product Types

### ■ CPU units (Built-in RAM)

| Product name | | Operation speed | Built-in RAM | Optional memory | | | Other | | Product number |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Expansion RAM | ROM | IC memory card | Clock/calendar | Comment memory | |
| FP2 | Standard type CPU unit | From 0.35µs | 16k steps note 1) | Available (See below.) | Available (See below.) | Not available | Available note 2) | Available note 3) | FP2-C1 |
| | CPU unit 64-point input | | | | | | | | FP2-C1D |
| | CPU unit with S-LINK | | | | | | | | FP2-C1SL |
| FPSH | Standard type CPU unit | From 0.03µs | 60k steps | Not available | Available (See below.) | Not available | Available (Built-in) | Available (Built-in) | FP2-C2 |
| | CPU unit with IC memory card interface | | 60k steps | Not available | Available (Built-in) | Available (See below.) | Available (Built-in) | Available (Built-in) | FP2-C2P |
| | CPU unit with IC memory card interface | | 120k steps | Not available | Available (Built-in) | Available (See below.) | Available (Built-in) | Available (Built-in) | FP2-C3P |

Notes: 1) For FP2 CPU unit, the capacity can be expanded up to 32k steps using the expansion RAM of the optional memory.
2) The expansion memory unit (optional memory) with clock/calendar function is required for FP2 CPU unit.
3) The expansion memory unit (optional memory) with comment input function is required for FP2 CPU unit.

### ■ Optional memories for FP2

| Product name | | Function | | | | Product number |
|---|---|---|---|---|---|---|
| | | Comment input | Clock/calendar | Expansion RAM | ROM socket | |
| For FP2 | Expansion memory unit | Available | Available | Not available | Not available | FP2-EM1 |
| | | Available | Available | Available | Not available | FP2-EM2 |
| | | Available | Available | Available | Available | FP2-EM3 |
| | | Not available | Not available | Available | Available | FP2-EM6 |
| | | Not available | Not available | Not available | Available | FP2-EM7 |
| | F-ROM | FLASH-ROM for program copy and ROM operation. Equivalent to SST-29EE010-120-4C-PH. Enables writing with the programming tool when attached to the CPU unit. | | | | FP2-EM4 |
| | EP-ROM | EP-ROM for program storage and ROM operation. Equivalent to M27C1001-12F1. A commercially available ROM writer is required. | | | | FP2-EM5 |

### ■ Optional memories for FP2SH

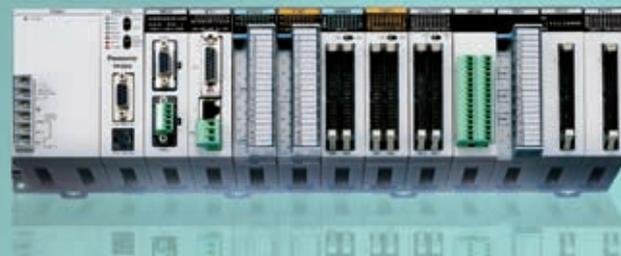| Product name | | Specification | Product number |
|---|---|---|---|
| ROM for FP2SH FP2-C2 | Expansion memory unit | Socket for ftting ROM to the CPU unit | FP2-EM7 |
| | F-ROM | FLASH-ROM for program copy and ROM operation. Equivalent to SST-29EE020-150-4C-PH Enables writing with the programming tool when attached to the CPU unit. | AFP5208 |
| | EP-ROM | EP-ROM for program storage and ROM operation. Equivalent to M27C2001-150F1. A commercially available ROM writer is required. | AFP5209 |
| IC memory card (Small PC card) for FP2SH CPU unit with IC memory card interface | F-ROM | Backup unnecessary. Perfect for program memory. Used for readout when using data memory. | AIC50020 |
| | SRAM | Perfect for data memory. Can also be used for program backup. Battery backups. | AIC52000 |

Note: Please refer to "FPΣ (Sigma) Product Types" for FP Memory Loader.

### ■ Backplanes

| Product name | | Specification | Product number |
|---|---|---|---|
| FP2 Backplane | Conventional type | 5-module type (for basic) | FP2-BP05 |
| | | 7-module type (for basic and expansion) | FP2-BP07 |
| | | 9-module type (for basic and expansion) | FP2-BP09 |
| | | 12-module type (for basic and expansion) | FP2-BP12 |
| | | 14-module type (for basic and expansion) | FP2-BP14 |
| | H type | 8 slots (for basic ) | FP2-BP11MH |
| | | 8 slots (for expansion) | FP2-BP10EH |
| FP2 Expansion cable | | 0.6m | FP2-EC |
| | | 2m | FP2-EC2 |

### ■ Power supply units

| Product name | Specification | Product number |
|---|---|---|
| FP2 Power supply unit | Input: 100 to 120VAC, Output: 2.5A | FP2-PSA1 |
| | Input: 200 to 240VAC, Output: 2.5A | FP2-PSA2 |
| | Input: 100 to 240VAC, Output: 5A | FP2-PSA3 |
| | Input: 24VAC, Output: 5A | FP2-PSD2 |

# FP2/FP2SH

## Product Types

### ■ I/O units

| Product name | Type | Number of point | Connection method | Specification | Product number |
|---|---|---|---|---|---|
| FP2 Input unit | DC input | 16 | Terminal | 12 to 24VDC | FP2-X16D2 |
| | | 32 | Connector | 24VDC | FP2-X32D2 |
| | | 64 | Connector | 24VDC | FP2-X64D2 |
| FP2 Output unit | Relay output | 6 | Terminal | 5A, 2 points per one common | FP2-Y6R |
| | | 16 | Terminal | 2A, 8 points per one common | FP2-Y16R |
| | Transistor output NPN | 16 | Terminal | 0.5A (12 to 24VDC), 0.1A (5VDC) | FP2-Y16T |
| | | 32 | Connector | 0.1A (12 to 24VDC), 50mA (5VDC) | FP2-Y32T |
| | | 64 | Connector | 0.1A (12 to 24VDC), 50mA (5VDC) | FP2-Y64T |
| | Transistor output PNP | 16 | Terminal | 0.5A (12 to24VDC), 0.1mA (5VDC) | FP2-Y16P |
| | | 32 | Connector | 0.1A (12 to 24VDC), 50mA (5VDC) | FP2-Y32P |
| | | 64 | Connector | 0.1A (12 to 24VDC), 50mA (5VDC) | FP2-Y64P |
| FP2 I/O mixed unit | DC input, Transistor output NPN | Input 32 Output 32 | Connector | Input 24VDC, Output 0.1A (12 to 24VDC), 50mA (5VDC) | FP2-XY64D2T |
| | | | | Input 24VDC, Output 0.1A (12 to 24 VDC), 50mA (5VDC) with on pulse catch input | FP2-XY64D7T |
| | DC input, Transistor output PNP | Input 32 Output 32 | Connector | Input 24VDC, Output 0.1A (12 to 24VDC), 50mA (5VDC) | FP2-XY64D2P |
| | | | | Input 24VDC, Output 0.1A (12 to 24 VDC), 50mA (5VDC) with on pulse catch input | FP2-XY64D7P |

Note: Pressure welding socket is supplied. A special tool (part number AXY52000) is needed for connection. Please purchase separately if you are using a terminal or flat cable socket.

### ■ Maintenance parts

| Product name | Specification | Product number |
|---|---|---|
| Battery | For FP2, button type battery, CR2450 or equivalent | AFC8801 |
| | For FP2SH CPU unit, battery with cable | AFP8801 |
| Dummy unit | For blank slot | FP2-DM |

### ■ Intelligent units for remote I/O control

| Product name | Specification | Controllable I/O points | Product number |
|---|---|---|---|
| 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. 2048 points per one unit | FP2-MW |
| FP2 CPU unit with S-LINK | Direct connection to SUNX Co., Ltd., S-LINK reduced-wiring system CPU unit with 128 points x 2 channels | 256 points at S-LINK section | FP2-C1SL |
| FP2 S-LINK unit | Direct connection to SUNX Co., Ltd., S-LINK reduced-wiring system CPU unit with 128 points x 2 channels | 128 points per one unit | FP2-SL2 |

### ■ Intelligent units for analog I/O

| Product name | | Specification | Number of I/O points | Product number |
|---|---|---|---|---|
| FP2 Analog input unit | FP2-AD8VI | Not insulated Voltage: 1 to 5V, -10 to +10V Current: 4 to 20mA, -20 to +20mA | Analog input: 8 channels | FP2-AD8VI |
| | FP2-AD8X | Insulated Voltages, currents, thermocouples, resistance thermometer devices | Analog input: 8 channels | FP2-AD8X |
| | FP2-RTD | R.T.D. type: Pt 100, JPt 100, JPt 1000 type | R.T.D. input: 8 channels | FP2-RTD |
| FP2 Analog output unit | | Voltage range: -10 to +10V   Current range: 0 to 20mA   Resolution: 1/4096 | Analog input: 4 channels | FP2-DA4 |

### ■ Positioning unit, high-speed counter unit and pulse I/O units

| Product name | Specification | | | Product number |
|---|---|---|---|---|
| | Output type | Number of axes controlled | Speed command | |
| FP2 Positioning unit RTEX | | 2 | | FP2-PN2AN |
| | | 4 | | FP2-PN4AN |
| | | 8 | | FP2-PN8AN |
| Control Configurator PM | Tool software for positioning unit RTEX (English) | | | AFPS66510 |
| FP2 Positioning unit Multiifunction type [3] | Transistor | 2, independent | 1pps to 500kpps | FP2-PP21 |
| | | 4, independent | | FP2-PP41 |
| | Line drive | 2, independent | 1pps to 4Mpps | FP2-PP22 |
| | | 4, independent | | FP2-PP42 |
| FP2 High-speed counter unit | 8 interrupt inputs   4-channel high-speed counter   8 comparison outputs Input: 24VDC   Output: 5 to 24VDC (0.1A, 12 points/0.8A, 4 points) | | NPN output | FP2-HSCT |
| | | | PNP output | FP2-HSCP |
| FP2 Pulse I/O unit | 8 interrupt inputs   4-channel high-speed counter   8 comparison outputs 4 pulse output channels   4 PWM output channels Input: 24VDC   Output: 5 to 24VDC (0.1A, 12 points/0.8A, 4 points) | | NPN output | FP2-PXYT |
| | | | PNP output | FP2-PXYP |

Notes: 1) Pressure welding socket is supplied. A special tool (part no. AXY52000) is needed for connection. Please purchase separately if you are using a terminal or flat cable socket.
2) Please refer to "FPΣ (Sigma) Product Types" for Motor driver I/F terminal II.
3) Previous FP2 positioning units FP2-PP2 and FP2-PP4 are not compatible with the multi-function type FP2 positioning unit.

# FP2/FP2SH

## Product Types

### ■ Serial communication and link-related intelligent units

| Product name | Specification | Number of channels | Product number |
|---|---|---|---|
| FP2 ET-LAN unit | Ethernet-compatible unit for FP2/FP2SH<br>To be mounted on the CPU backplane | 1ch | FP2-ET1 |
| Control Configurator ET | ET-LAN unit setting software (English) | – | AFPS32510 |
| FP2 Multi-wire link unit | For PLC links<br>Compatible with MEWNET-W/MEWNET-W2 | 1ch | FP2-MW |
| FP2 Multi-communication unit | Up to two blocks to be attached can be selected among RS485, RS232C, and RS422 blocks.<br>General-purpose serial communications, computer links, PLC links (MEWTNET-W0) | 2ch | FP2-MCU |
| RS232C block | (For the multi-communication unit) 230kbps, 15m max. | 1ch | FP2-CB232 |
| RS422 block | (For the multi-communication unit) 230kbps, 1200m max. | 1ch | FP2-CB422 |
| RS485 block | (For the multi-communication unit) For PLC links (MEWNET-W0): 115kbps, 16 stations, 1,200m | 1ch | FP2-CB485 |
| FP2 Computer communication unit | For 1:1 communication between a PLC and a computer<br>RS232C x 2 ch Connection with a control panel is also possible | 2ch | FP2-CCU |
| FP2 Serial data unit | For communications with general-purpose RS232C devices<br>The serial input/output is executed by sequence commands | 2ch | FP2-SDU |
| FP2 FNS unit | Flexible Network Slave unit for FP2/FP2SH | 1ch | FP2-FNS |
| PROFIBUS Plug-In Module | Plug-In network block for PROFIBUS | 1ch | AFPN-AB6200 |
| DeviceNet Plug-In Module | Plug-In network block for DeviceNet | 1ch | AFPN-AB6201 |
| CANopen Plug-In Module | Plug-In network block for CANopen | 1ch | AFPN-AB6218 |

### ■ FPWIN Pro PLC programming software according to IEC 61131-3

| Product name | Type | Product number | Applicable PLC | | | |
|---|---|---|---|---|---|---|
| | | | FP-X | FPΣ | FP0 FP-e | FP2 / FP2SH |
| FPWIN Pro for Windows | Full version with English manual | FPWINPROFEN5 | A | A | A | A |
| | Full version with German manual | FPWINPROFDE5 | A | A | A | A |
| | Full version with French manual | FPWINPROFFR5 | A | A | A | A |
| | Small version with English manual | FPWINPROSEN5 | A | A | A | N/A |
| | Small version with German manual | FPWINPROSDE5 | A | A | A | N/A |
| | Small version with French manual | FPWINPROSFR5 | A | A | A | N/A |

A: Available, N/A: Not available

### ■ Other software tools

| Product name | Description | Product number |
|---|---|---|
| FP OPC Server | Standardized connectivity to FP Series PLCs (software with one license) | AFPS03510D |
| FP OPC Server license | Additional license for FP OPC Server | AFPS03517D |
| FP Data Analyzer | Software tool to read and display PLC data | AFPS04510D |
| PCWAY | Data monitoring, logging and setting software based on Excel | AFW10031 |
| CommX | OCX for communication, Internal data can be displayed and operated on Visual Basic | AFW20031 |
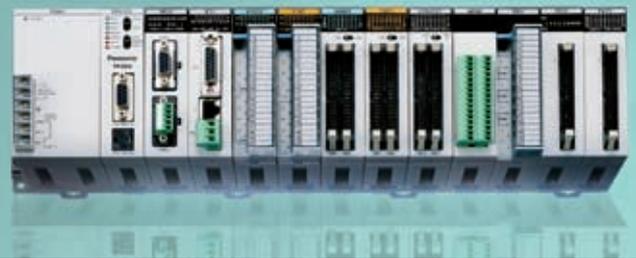
# FP2/FP2SH

## Dimensions

in mm



DIN rail mounting groove
(35-mm wide DIN EN50022)
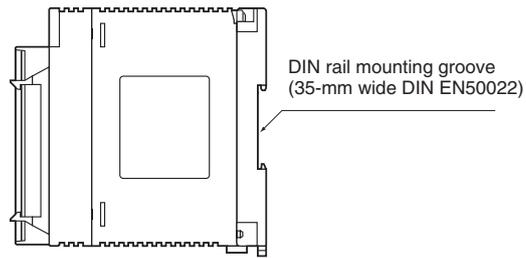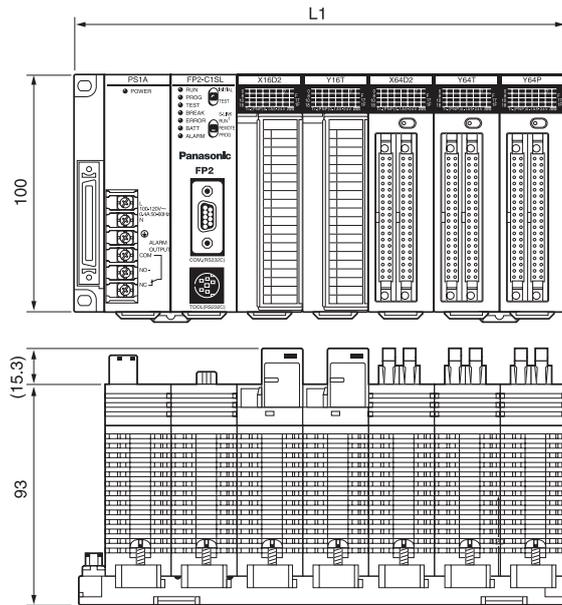
Mounting dimension (Tolerance: 1.0)
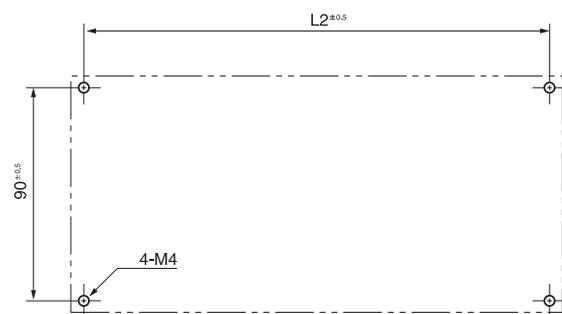


* The illustration shows a conventional 7-module type backplane.

| Conventional backplanes | | | | | |
|---|---|---|---|---|---|
| | 5-module | 7-module | 9-module | 12-module | 14-module |
| L1 (mm) | 140 | 209 | 265 | 349 | 405 |
| L2 (mm) | 130 | 199 | 255 | 339 | 395 |

| H type backplane | |
|---|---|
| | 11-module (master backplane) | 10-module (expansion backplane) |
| L1 (mm) | 349 | 349 |
| L2 (mm) | 339 | 339 |

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