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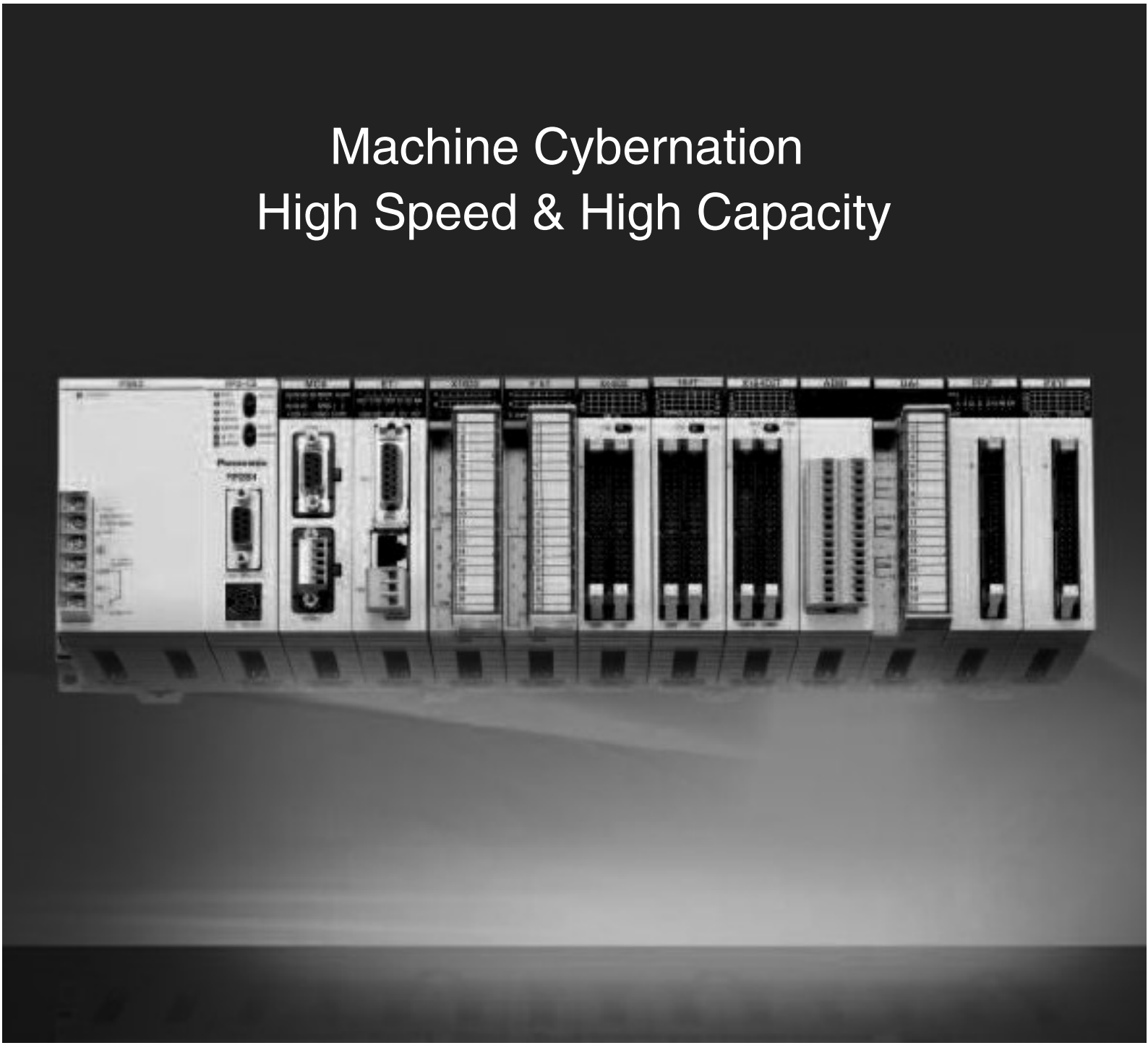
Panasonic

ideas for life

Programmable Controller

FP2/FP2SH

Machine Cybernation
High Speed & High Capacity



Programmable Controller FP2/FP2SH
ARCT1B283E '07.3

http://www.mew.co.jp/ac/e

Matsushita Electric Works, Ltd.

Compact body loaded with functions equivalent to a medium-scale PLC
Superior cost performance, and ideal for built-in use

FP2/FP2SH is a compact PLC series (W 140 x H 100 x D 110 mm W5.512 x H3.937 x D4.331 inch when using five modules) 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 six types, including intelligent types, according to the application

There are six 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. * See page 10 for details.

FP2 Intelligent type is also available
Superior cost performance



Standard type
FP2-C1
(AFP2211)



With 64 input points
FP2-C1D
(AFP2212)



With S-LINK
FP2-C1SL
(AFP2214)

FP2SH Industry's highest class processing speed
Adequate programming capacity



60-k step
standard type
FP2-C2
(AFP2231)



60-k step type
for small PC card
FP2-C2P
(AFP2235)

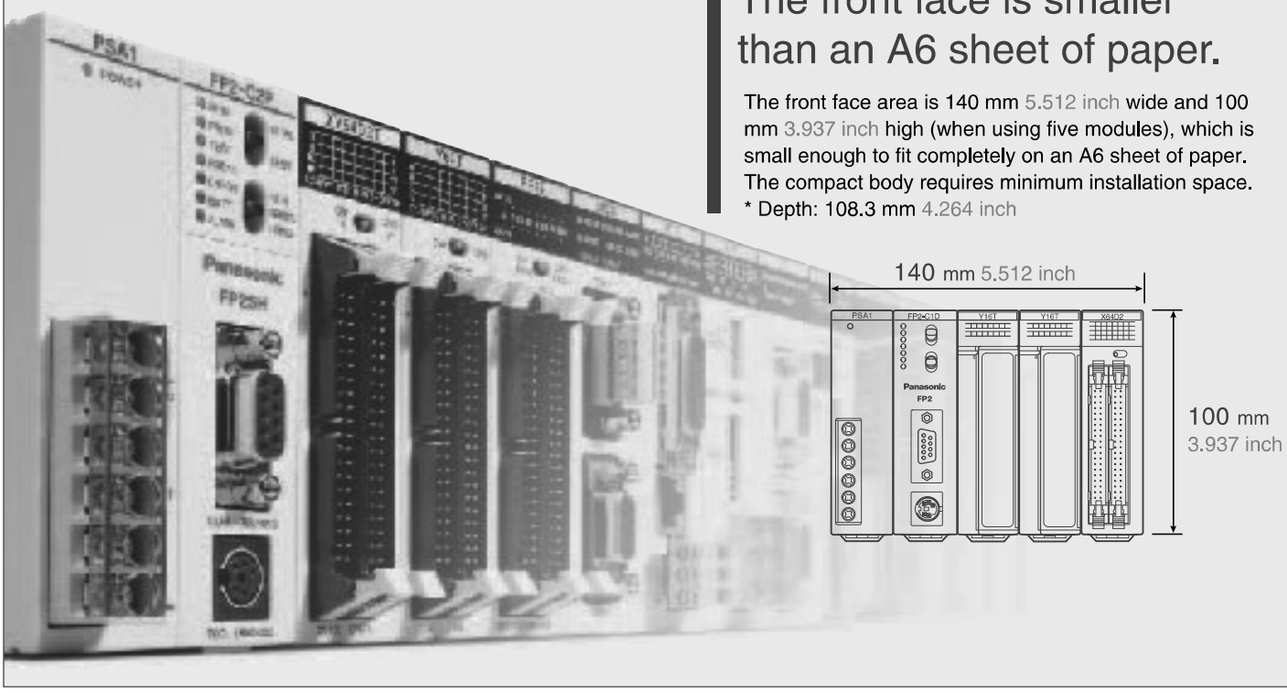


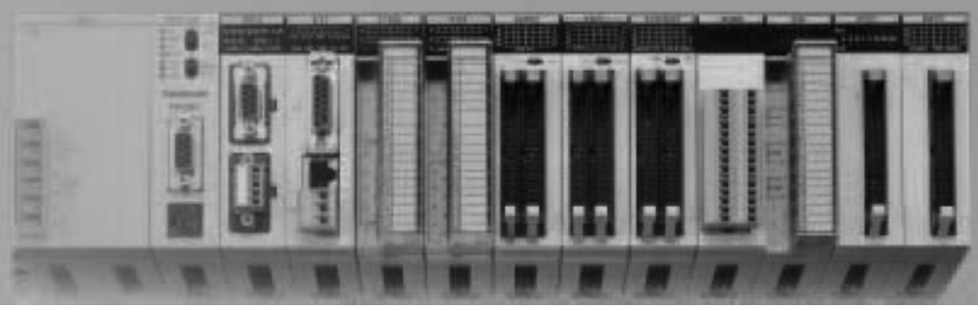
120-k step type
for small PC card
FP2-C3P
(AFP2255)

Body size

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

The front face area is 140 mm 5.512 inch wide and 100 mm 3.937 inch 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: 108.3 mm 4.264 inch





Memory and I/O control

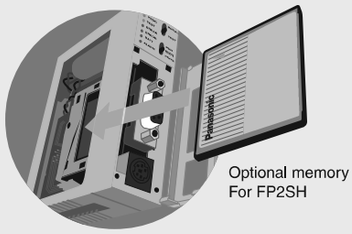
Equipped with an adequate program memory and operating memory capacity

The body is compact; however, the capacity of the standard program memory of FP2/FP2SH is as large as 16 k/60 k steps, and, when optional memory is added, 32 k/120 k 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 32 k 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.



Optional memory
For FP2SH

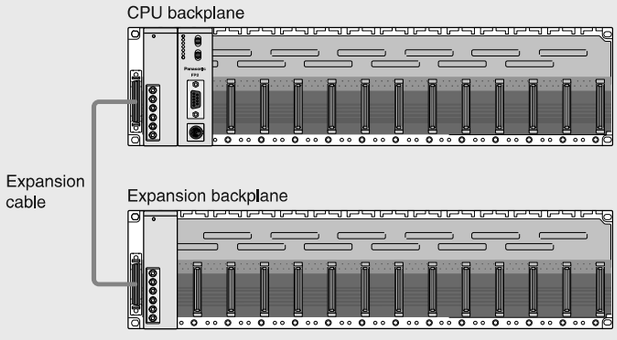
I/O point expansion by adding backplanes

* See page 12 for details.

NEW

● Conventional backplane

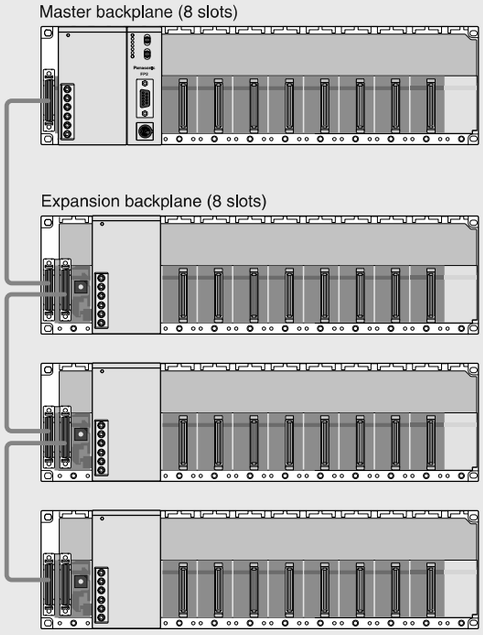
Only one backplane can be added to one master backplane. When both the master and expansion backplanes are of the 14-module type, up to 1,600 I/O points can be controlled.



(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	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, 2 m 6.562 ft	3 cables, 3.2m 10.499 ft

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

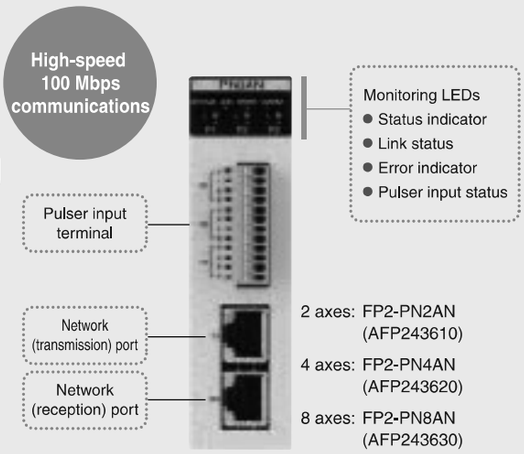
Motor control

NEW

■ "RTEX" positioning units

Compatible with Realtime Express MINAS A4N[*1] network servo systems Facilitate multi-axis high precision positioning

- High-accuracy multi-axis positioning control achieved by high-speed 100 Mbps communications
- 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



*1: Realtime Express and MINAS A4N are a trademark and a product name of Matsushita Electric Industrial Co., Ltd.

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 can be 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 (20-k steps/1 ms (measured by our company), program capacity of 120-k steps) adequately supports the control of large-scale equipment.

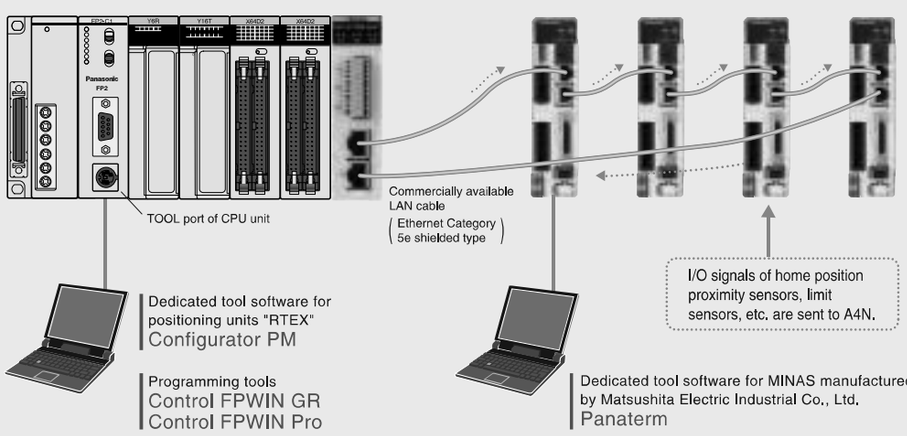
System configuration

Maximum number of connectable positioning 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.



Contact for inquiries about MINAS AC servomotor series:
Motor Company, Matsushita Electric Industrial Co., Ltd.
Telephone: +81-72-870-3057 Facsimile: +81-72-870-3120
http://panasonic.co.jp/motor/eng/



Programmable Controller
FP2/FP2SH

■ Positioning units

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)

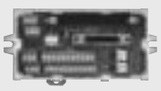


Positioning Unit (2 axes)
FP2-PP21 (AFP2432)
FP2-PP22 (AFP2434)



Positioning Unit (4 axes)
FP2-PP41 (AFP2433)
FP2-PP42 (AFP2435)

- 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:
  http://www.mew.co.jp/ac/e/fasys/plc
- Motor Driver I/F Terminal II is available for connection with MINAS AC servo series.



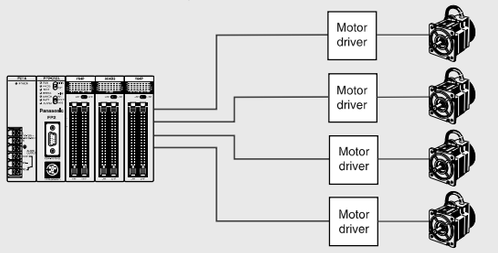
For 1 axis (AFP8503)



For 2 axes (AFP8504)

■ Configuration

● One unit can control up to 4 axes.



■ High-speed counter units and Pulse I/O units

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



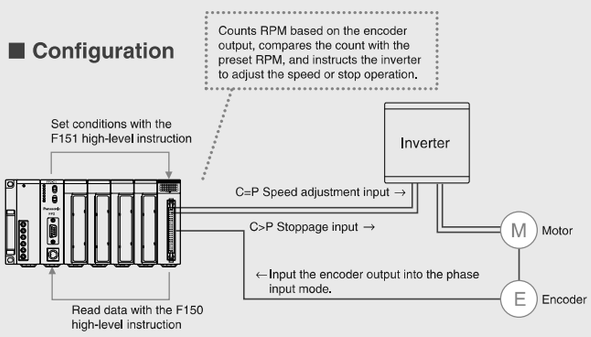
High-speed counter units
FP2-HSCT(NPN) (AFP2441)
FP2-HSCP(PNP) (AFP2451)



Pulse I/O units
FP2-PXYT(NPN) (AFP2442)
FP2-PXYP(PNP) (AFP2452)

- Equipped with four channels of a maximum of 200 kHz 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.
- Have an interrupt function that allows the interrupt program to be started when the elapsed time reaches a set time or by timing it with an external input signal.
- Control up to 100 kpps pulse output and up to 30 kpps PWM output.
- A single module has high-speed counter, interrupt, general I/O, pulse output*, PWM output* functions, allowing for high-efficient system configuration. * Only available with the pulse I/O units.

■ Configuration

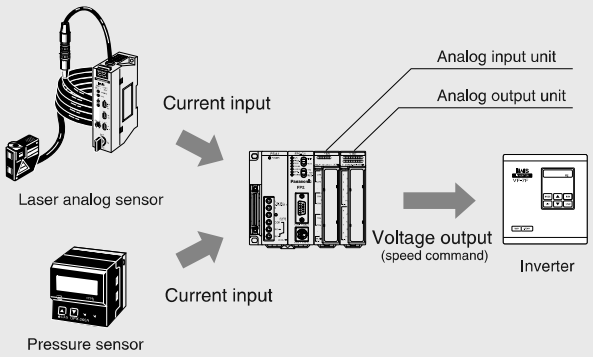


Analog control units

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 500 μs by each channel**
  The speed of voltage and current input/output conversion can reach as high as 500 μs.
- **I/O refresh system**
  Since input/output data is allocated to the I/O memory, complicated programming is not necessary.

■ Configuration



■ 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 isolated channels

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

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

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


FP2-AD8X
(AFP2401)

- 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.

Input unit solely for RTDs (Pt100/Pt1000)

High speed, high accuracy
Conversion speed: 20 ms/ch
Conversion accuracy: ±0.3%
(0 to 55°C)

- For users who input RTD data only and require more affordable type


FP2-RTD
(AFP2402)

Low cost input unit solely for voltage/current data

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


FP2-AD8VI
(AFP2400L)

■ Analog output unit

Supports multiple channels.
(Four channels per unit)

High speed, high accuracy
Conversion speed: 500 μs/ch
Overall accuracy: ±1.0% FS or less
(0 to 55°C)


FP2-DA4
(AFP2410)

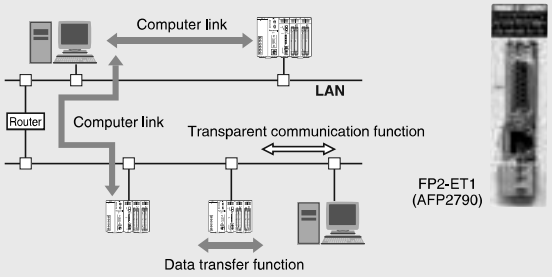
Networking units

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

■ Open networks

Ethernet

(1) Supports three communications interfaces: 100BASE-TX, 10BASE-T, and 10BASE5
(2) Supports TCP/IP and UDP/IP.
(3) Communications among a maximum of eight connections are available.
(4) Compatible with user-friendly MEWTOCOL.
(5) Supports remote programming.



FP2-ET1
(AFP2790)

FL-net NEW

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) 254 nodes max.



FP2-VE
(AFP27960,
only for FP2SH)

■ PLC link

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

VE mode NEW

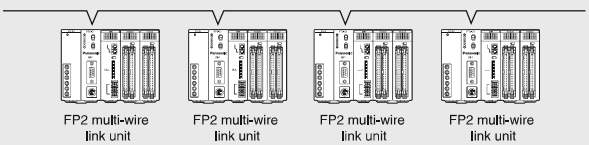
High-speed, large-capacity PLC link using the VE link unit based on Ethernet

(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

MEWNET-W2 mode

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

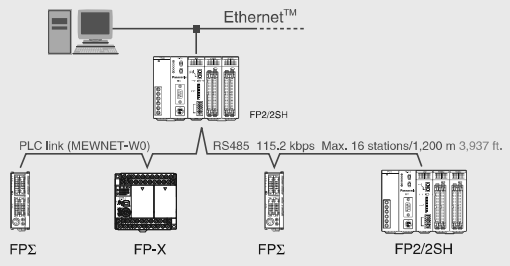
(1) 500-kbps transmission speed
(2) Transfer of data of 4,096 points/4,096 words is possible.
(3) Up to 32 units can be connected.
(4) Extendable to 1,200 m 3,937 ft.



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 FP2/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.



* Each FPΣ unit also requires that an RS485 cassette (AFPG803 or AFPG806) be attached.
* Each FP-X unit requires that an AFPX-COM3 or AFPX-COM4 communication cassette be attached.

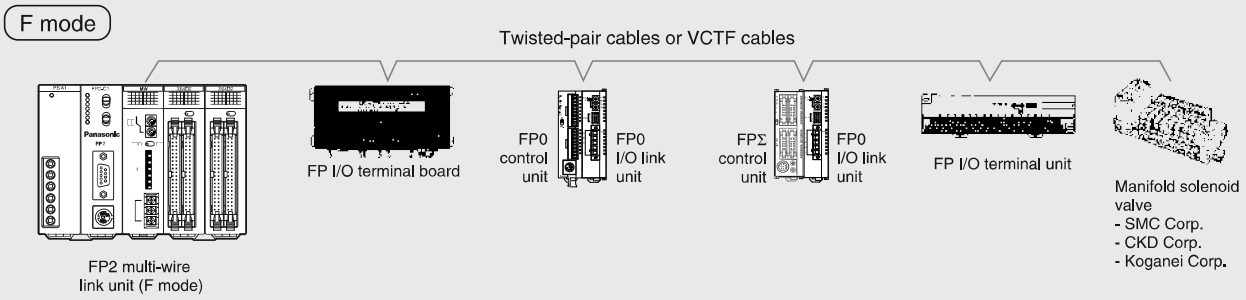
■ Remote I/O systems

MEWNET-F mode

The number of I/O points can be increased up to 8,192, and the transmission distance can be extended up to 700 m 2,297 ft. 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 complicated 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



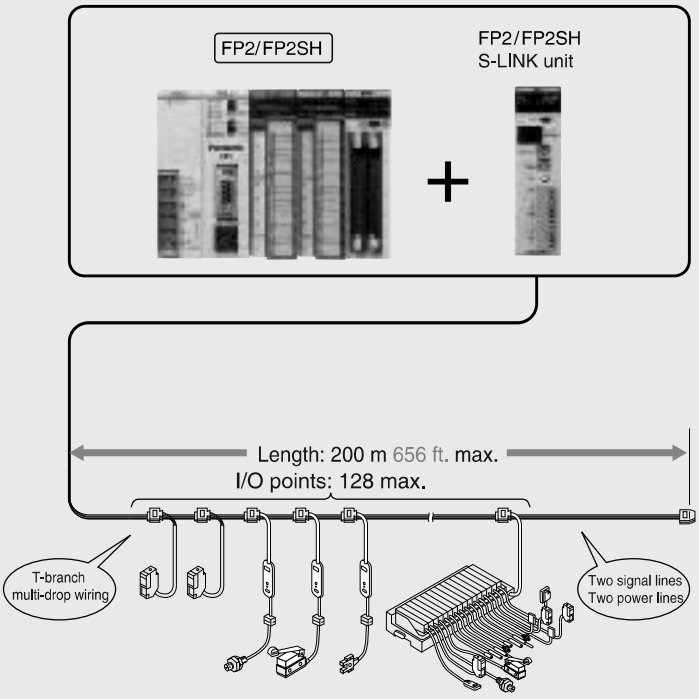
S-LINK

- 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 2,048 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.


S-LINK unit

S-LINK CPU unit

- Sensors to be connected by S-LINK must be chosen from 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 control

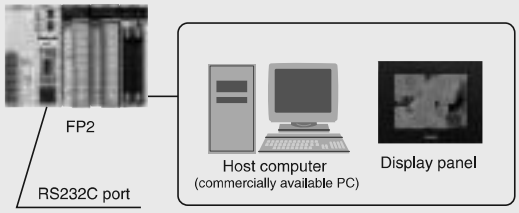
The CPU units have an RS232C port as standard equipment. The communication unit enables connections with RS232C/RS485/ RS422-compatible devices.

CPU units

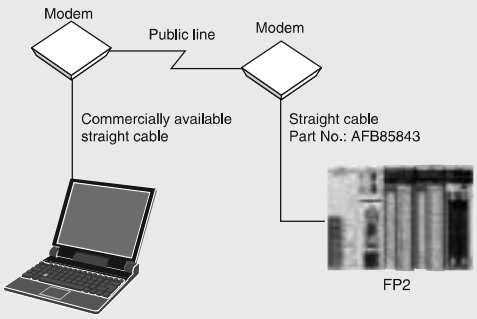


All CPU units have an RS232C port as standard equipment.
They can be directly connected to a host computer or a display panel, and can also be connected to a modem to collect data from and change programs in devices in a remote location.

● Direct connection to a control panel or a computer



● Remote monitoring via a modem



● "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)



FP2-MCU
(AFP2465)

The communication blocks are detachable.

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

Industry's fastest level

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

[Selectable from three communication blocks]
The use of only one channel is also possible.

RS232C	RS422	RS485
		
FP2-CB232 (AFP2803)	FP2-CB422 (AFP2804)	FP2-CB485 (AFP2805)

The combination is selectable.



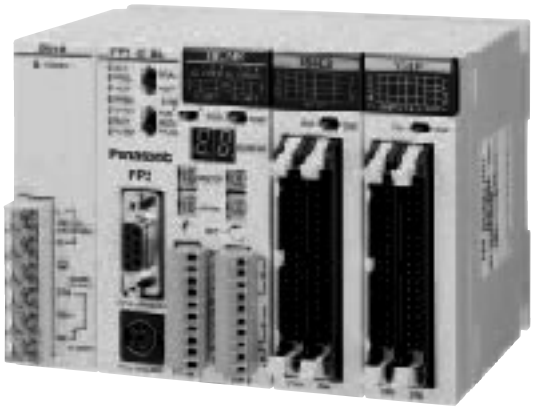
COM2 (the lower channel) is sealed before shipping so that it can be protected from damage even when only COM1 is used.

Multi-communication unit
FP2-MCU (AFP2465)

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

FP2

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



■ Features

1. **Compact body W140 x H100 mm* W 5.512 x H 3.937 inch.**
   The functions for a medium-scale PLC are squeezed into a compact body which requires minimal installation area for an overall reduction in the device size.
   * The five-module type. (H: 100, W: 140, D: 108.3 mm) High design frexibility for number of modules.
2. **Module specifications that allow you to design as you desire.**
   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. **Standard equipped with RS232C port.**
   RS232C port allows connection with operation display panels and host computers, as well as remote surveillance using modems.
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 supported too. So you can simplify programs for data processing more.

■ Power supply / I/O specifications

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

■ Performance specifications

Item			Description
Number of I/O points			Up to 768 points
Expansion		Standard	Up to 1 backplane Units: 25max. 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			0.35 µs/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. 200 kHz)
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
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
Adjustable input time Itering	Not available
Clock/Calendar function	Can be used with the addition of the calendar function option.

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Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

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