

Matsushita Electric Works FP2-AD8
Analog Input Module



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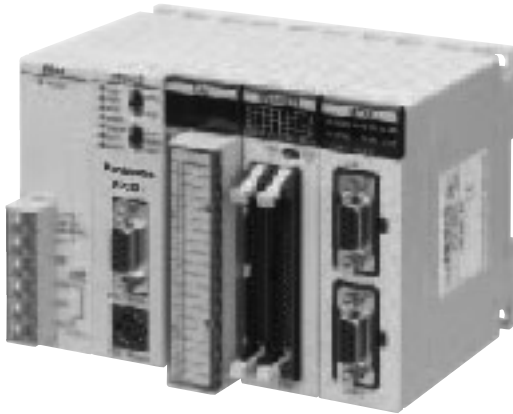
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FP2SH

Scanning time of 1 ms for 20k steps.

A high-performance model for high-speed operation.



■ Features

1. Scanning time of 1 ms for 20k steps.

With an operating speed at the top of its class, super high-speed processing is made possible. The result is a dramatically decreased tact time and high-speed device.

2. Large programming capacity of up to 120k steps.

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

3. Optional small PC card is also available.

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

4. Built-in comment and calendar timer functions.

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

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

■ 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 \pm 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: 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	0.03 μ s/step (Basic instruction)
Built-in memory	RAM (ROM/Small PC card is optional)
Memory capacity	Approx. 60 k steps/Approx. 120 k steps (varies with different models)
Operation Memory	Internal relay 14,192 points
	Timer/Counter(T/C) 3,072 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. 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 MEWNET-VE FL-NET
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

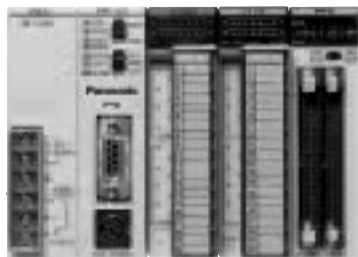
■ Other built-in functions

Item	Description
Program block-edit during RUN	Available
Constant scan	Available
Adjustable input time ltering	Not available
Clock/Calendar function	Built-in type

FP2/FP2SH system configurations and unit lineup

Unit combinations

- Each unit is counted in the number of modules occupied. Most of the units occupy one module each. Some units occupy two modules each.
- Each unit is mounted on a backplane chosen depending on the total number of modules occupied by the all units used.
The power supply unit and CPU unit must be mounted on the CPU backplane.
- Only one backplane other than the five-module type can be added by using an expansion cable. A power supply must be mounted on the expansion backplane.
- If the backplane is of the H type, up to three backplanes can be added.
- Most of the units can be used in any combination; however, some combinations are subject to constraints due to the unit type, current consumption, and other factors besides the above requirements.
Please contact us for details.



Power Supply Units



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



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



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



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

Backplanes

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



5-module type
FP2-BP05 (AFP25005)



7-module type
FP2-BP07 (AFP25007)



9-module type
FP2-BP09 (AFP25009)



12-module type
FP2-BP12 (AFP25012)



14-module type
FP2-BP14 (AFP25014)

H type Backplanes



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



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

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

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



Expansion cable
(60cm/23.62 in.)
FP2-EC (AFP2510)



Expansion cable
(2m/78.74 in.)
FP2-EC2 (AFP2512)



Dummy unit
FP2-DM
(AFP2300)

CPU Units

FP2



Standard type
FP2-C1
(AFP2211)



With 64-point input
FP2-C1D
(AFP2212)



With S-LINK
FP2-C1SL
(AFP2214)

FP2SH



Standard type
(60k steps)
FP2-C2
(AFP2231)



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



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

Input and Output Units



16-point DC input
FP2-X16D2 (AFP23023)
16-point NPN transistor output
FP2-Y16T (AFP23403)
16-point PNP transistor output
FP2-Y16P (AFP23503)
6-point Relay output (5A)
FP2-Y6R (AFP23101)
16-point Relay output (2A)
FP2-Y16R (AFP23103)



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



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

Optional Memories

For FP2



FP2-EM1
FP2-EM2



FP2-EM3
FP2-EM6
FP2-EM7

Type of memory unit

Product number	Part number	Comment input function	Clock/calendar function	With 16k expansion RAM	ROM socket
FP2-EM1	AFP2201	A	A	N/A	N/A
FP2-EM2	AFP2202	A	A	A	N/A
FP2-EM3	AFP2203	A	A	A	A
FP2-EM6	AFP2206	N/A	N/A	A	A
FP2-EM7	AFP2207	N/A	N/A	N/A	A

A: Available
N/A: Not available



F-ROM
FP2-EM4 (AFP2204)



EP-ROM
FP2-EM5 (AFP2205)

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)

Analog Input/Output Units



Voltage/current
input unit
FP2-AD8VI
(AFP2400L)



Multiple analog
input unit
FP2-AD8X
(AFP2401)



Resistance thermometer
device input unit
FP2-RTD
(AFP2402)



Analog output
unit
FP2-DA4
(AFP2410)

Positioning Units

NEW



(2-axis)

Positioning units
RTEX
FP2-PN2AN
(AFP243610)

NEW



(4-axis)

Positioning units
RTEX
FP2-PN4AN
(AFP243620)

NEW



(8-axis)

Positioning units
RTEX
FP2-PN8AN
(AFP243630)



(2-axis)

Positioning units
FP2-PP21 FP2-PP22
(AFP2432) (AFP2434)



(4-axis)

Positioning units
FP2-PP41 FP2-PP42
(AFP2433) (AFP2435)

Pulse Input/Output Units



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



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



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



Serial data unit
FP2-SDU
(AFP2460)



Computer
communication unit
FP2-CCU
(AFP2462)

Link-related Units

NEW



VE-LINK
FP2-VE (AFP27960)



ET-LAN
FP2-ET1 (AFP2790)

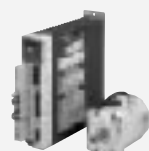


Multi-wire link unit
FP2-MW (AFP2720)



S-LINK
FP2-SL2 (AFP2780)

Panasonic Servo MINAS AII/S Series



Motor Driver I/F Terminal II



AFP8503



AFP8504

2-axis type

Specifications ①

■ CPU units

Item			FP2 CPU unit	FP2SH CPU unit		
			FP2-C1 (AFP2211) FP2-C1D (AFP2212) FP2-C1SL (AFP2214)	FP2-C2 (AFP2231)	FP2-C2P (AFP2235)	FP2-C3P (AFP2255)
Operation speed	Basic		0.35 μs or more	0.03 μs or more		
	High-level		0.93 μs or more	0.06 μs or more		
Program capacity	Built-in RAM		16 k steps	60 k steps		120 k steps
	w/expansion		32 k steps	Not available		Not available
Number of I/O points	No expansion	Conventional type	Max. 768 points	Max. 768 points		
		H type	Max. 512 points	Max. 512 points		
	w/expansion	Conventional type	Max. 1600 points	Max. 1600 points		
		H type	Max. 2048 points	Max. 2048 points		
	w/ remote I/O		Max. 2048 points	Max. 8192 points		
Operation memory	Internal relay		4048 points	14192 points		
	Data register		6000 words	10240 words		
	File register		0 to 143333 words (w/expansion 0 to 30717 words)	32765 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 (AFP2631)	FP2-PSA2 (AFP2632)	FP2-PSA (3AFP2633)	FP2-PSD2 (AFP2634)	
Input	Rated voltage	100 V - 120 V AC	200 V - 240 V	100 V - 240 V AC	24 V DC	
	Current Current	0,4 A or less (at 100 V AC)	0,2 A or less (at 200 V AC)	0,7 A or less (at 100 V AC) 0,4 A or less (at 200 V AC)	2,5 A or less	
	Surge current	40 A or less (55°C)		30 A or less (25°C)	10 A or less	
	Rated frequency	47 Hz ~ 63 Hz				—
	Operating	85 to 132 V AC	170 to 264 V AC	85 to 264 V AC	20,4 to 31,2 V DC (note)	
Output	Voltage range	2,5A max.		5 A max.		
Alarm contact capacity		30 V DC 1 A				
Alarm contact operation		When the ALARM LED of CPU unit is lit				
Alarm contact type		1c contact				
Leakage current		Between input and ground terminals, 0,75 mA or less				
Breakdown voltage		1500V AC for 1 minute (between input and ground terminals)				
Insulation resistance		100 MΩ 500V DC (between input and ground terminals)				
Guaranteed lifetime		20000 hours at 55°C				
Overcurrent protection function		Built-in overcurrent protection				
Fuse		Built-in type				
Terminal screw		M3				
Module size		1 module	1 module	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 100 ms or more.

■ 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 ^{note 1)}	DC input type/Transistor output (NPN) type ^{note 2)}	DC input type/Transistor output (PNP) type ^{note 3)}
		FP2-X16D2 (AFP23023)	FP2-X32D2 (AFP23064)	FP2-X64D2 (AFP23067)	FP2-XY64D2T (AFP23467)	FP2-XY64D2P (AFP23567)
Rated input voltage		12 - 24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
Rated input current		Approx. 8 mA (at 24 V DC)	Approx. 4.3 mA (at 24 V DC)	Approx. 4.3 mA (at 24 V DC)	Approx. 4.3 mA (at 24 V DC)	Approx. 4.3 mA (at 24 V DC)
Input impedance		Approx. 3 kΩ	Approx. 5.6 kΩ	Approx. 5.6 kΩ	Approx. 5.6 kΩ	Approx. 5.6 kΩ
Min. ON voltage/Min. ON current		9.6 V/4 mA	19.2 V/4 mA	19.2 V/4 mA	19.2 V/4 mA	19.2 V/4 mA
Max. OFF voltage/Max. OFF current		2.5 V/1 mA	5.0 V/1.5 mA	5.0 V/1.5 mA	5.0 V/1.5 mA	5.0 V/1.5 mA
Response time	OFF→ON	0.2 ms or less	0.2 ms or less	0.2 ms or less	0.2 ms or less	0.2 ms or less
	ON→OFF	0.2 ms or less	0.3 ms or less	0.3 ms or less	0.3 ms or less	0.3 ms or less
Input points per common		8 points/common (Either the positive or negative of the input power supply can be connected to the common terminal.)	32 points/common	32 points/common	32 points/common	32 points/common
Connection method		Terminal block (M3 screw)	One 40-pin connector	Two 40-pin connectors	Two 40-pin connectors	Two 40-pin connectors

Note: 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" (AFP2212).

2) The specifications also apply to the DC-input, transistor-output (NPN) type I/O-mixed unit with ON pulse catch input "FP2-XY64D7T" (AFP23477).

However, the response time is as follows: OFF→ON: 0.2 ms or less (X0-X1F); ON→OFF: 0.3 ms or less (X0-X1B), 1.0 to 5.0 ms (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" (AFP23577).

However, the response time is as follows: OFF→ON: 0.2 ms or less (X0-X1F); ON→OFF: 0.3 ms or less (X0-X1B), 1.0 to 5.0 ms (X1C-X1F)

Output units

Item	Relay output unit				Transistor output unit				I/O mixed unit (output side) <small>note 3) and 4)</small>	
	<small>note 1)</small> 6-point type	16-point type	NPN open collector <small>note 2)</small> 16-point type	PNP open collector <small>note 2)</small> 16-point type	NPN open collector	PNP open collector	NPN open collector	PNP open collector	DC input type/ Transistor output (NPN) type	DC input type/ Transistor output (PNP) type
	FP2-Y6R (AFP23101)	FP2-Y16R (AFP23103)	FP2-Y16T (AFP23403)	FP2-Y16P (AFP23503)	FP2-Y32T (AFP23404)	FP2-Y32P (AFP23504)	FP2-Y64T (AFP23407)	FP2-Y64P (AFP23507)	FP2-XY64D2T (AFP23467)	FP2-XY64D2P (AFP23567)
Rated control capacity	5A 250V AC (10A/common) 5A 30V DC (10A/common) Min. load: 100mA 10V (resistor load)	2A 250V AC (5A/common) 2A 30V DC (5A/common) Min. load: 100mA 10V (resistor load)	—	—	—	—	—	—	—	—
Rated load voltage	—	—	5-24 V DC	5-24 V DC	5-24 V DC	5-24 V DC	5-24 V DC	5-24 V DC	5-24 V DC	5-24 V DC
Max. load current	—	—	0.5 A (at 12 to 24 V DC) 0.1 A (at 5 V DC)	0.5 A (at 12 to 24 V DC) 0.1 A (at 5 V DC)	0.1 A (at 12 to 24 V DC) 50 mA (at 5 V DC)	0.1 A (at 12 to 24 V DC) 50 mA (at 5 V DC)	0.1 A (at 12 to 24 V DC) 50 mA (at 5 V DC)	0.1 A (at 12 to 24 V DC) 50 mA (at 5 V DC)	0.1 A (at 12 to 24 V DC) 50 mA (at 5 V DC)	0.1 A (at 12 to 24 V DC) 50 mA (at 5 V DC)
Max. surge current	—	—	3A 10 ms or less	3A 10 ms or less	0.3 A	0.3 A	0.3 A	0.3 A	0.3 A	0.3 A
OFF state leakage current	—	—	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	—	—	0.5 V or less	0.5 V or less	1 V or less (at 6 to 26.4 V DC) 0.5 V or less (at 6 V DC or less)	1.5 V or less (at 6 to 26.4 V DC) 0.5 V or less (at 6 V DC or less)	1 V or less (at 6 to 26.4 V DC) 0.5 V or less (at 6 V DC or less)	1.5 V or less (at 6 to 26.4 V DC) 0.5 V or less (at 6 V DC or less)	1 V or less (at 6 to 26.4 V DC) 0.5 V or less (at 6 V DC or less)	1.5 V or less (at 6 to 26.4 V DC) 0.5 V or less (at 6 V DC or less)
Repose time	OFF→ON	10 ms or less	10 ms or less	0.1 ms or less	0.1 ms or less	0.1 ms or less	0.1 ms or less	0.1 ms or less	0.1 ms or less	0.1 ms or less
	ON→OFF	8 ms or less	8 ms or less	0.3 ms or less	0.3 ms or less	0.3 ms or less	0.3 ms or less	0.3 ms or less	0.3 ms or less	0.3 ms or less
Power supply for driving internal circuit	Voltage	24V DC±10% (21.6V to 26.4V DC)	24V DC±10% (21.6V to 26.4V DC)	4.75 to 26.4V DC	4.75 to 26.4V DC	4.75 to 26.4V DC	4.75 to 26.4V DC	4.75 to 26.4V DC	4.75 to 26.4V DC	4.75 to 26.4V DC
	Current	70mA or less	160 mA or less	120 mA or less (at 24 V DC)	70 mA or less (at 24 V DC)	140 mA or less (at 24 V DC)	150 mA or less (at 24 V DC)	250 mA or less (at 24 V DC)	270 mA or less (at 24 V DC)	120 mA or less (at 24 V DC)
Input points per common	2 points/common	8 points/common	8 points/common	8 points/common	32 points/common	32 points/common	32 points/common	32 points/common	32 points/common	32 points/common
Connection method	Terminal block (M3 screw)	Terminal block (M3 screw)	Terminal block (M3 screw)	Terminal block (M3 screw)	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 1: The number of ON points that can be actuated simultaneously is limited by the input voltage and the ambient temperature.
2: The maximum load current is limited by the external power supply voltage.
1) The current capacity of each common terminal is 5 A 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" (AFP23477).
4) The specifications also apply to the DC-input, transistor-output (PNP) type I/O-mixed unit with ON pulse catch input "FP2-XY64D7P" (AFP23577).

Analog I/O units

1. Analog input

Item	FP2-AD8X (AFP2401)	FP2-RTD (AFP2402)	FP2-AD8V1 (AFP2400L)
Number of input points	8 channels	8 channels	8 channels
Input range (resolution)	Voltage	±10 V (1/65536)	±10 V (1/65536)
		1 V ± 5 V (1/13107)	1 V to 5 V (1/13107)
		±100 mV (1/65536)	—
	Current	— <small>note 1)</small>	±20 mA (1/32768)
		—	4 mA to 20 mA (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	500 μs/ch (insulated), 5 ms (insulated)	500 μs/ch
	Current	—	500 μs/ch
	Thermocouple	20 ms/ch	—
	R.T.D	20 ms/ch	—
Overall accuracy	Voltage: ±0.1% F.S. (25 °C) Voltage temperature coefficient: ±0.3% (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)		—
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 (AFP2410)
Number of output points	4 channels
Output range (digital input)	±10 V (K-2048 to K+2047)
	0 to 20 mA (K0 to K4095)
Resolution	1/4096
Conversion speed	500 μs/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 ②

■ ET-LAN units (AFP2790)

● Performance Specification

Item	Specifications
Communications function	- MEWTOCOL-COM: computer link function (Max. 2K B) - MEWTOCOL-DAT: data transfer (Max. 1020 words) - 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 ^{note 1)}	100BASE-T ^{note 1)}	100BASE5
Transmission speed	100M bit/s	10M bit/s	10M bit/s
Transmission method	Base band	Base band	Base band
Max. segment length	100 m ^{note 2)}	100 m ^{note 2)}	500 m
Max. distance between nodes	205 m (2 segments)	500 m (5 segments)	2500 m (5 segments)
Communication cable or connection	Category 5 UTP cable	Category 3, 4 and 5 UTP cable	Transceiver cable
Max. transceiver cable length	—	—	50 m ^{note 3)}
Max. number of nodes	—	—	100 nodes/segment
Node spacing	—	—	Integer multiples of 2.5 m

Notes: 1) Switching between 100BASE-TX and 10BASE-T is done automatically by auto negotiation function.
2) The standards cite 100 m 328.08 ft. as the maximum, but noise resistance measures such as attaching a ferrite core may be necessary in some cases, depending on the usage environment. Also, if the hub is positioned close to a control board, we recommend using it at a distance of 10 m 32.808 ft. or less.
3) The standards cite 50 m 164.04 ft. as the maximum, but noise resistance measures such as attaching a ferrite core may be necessary in some cases, depending on the usage environment. Also, if the transceiver is positioned close to a control board, we recommend using it at a distance of 5 m 16.404 ft. or less.

■ Multi-communication units (AFP2465)

Item	General-purpose serial communications		Computer link ^(note 1) (Matsushita open protocol "MEWTOCOL" should be used.)		PLC link function
	1:1 communications	1:N communications	1:1 communications	1:N communications	
Communication block used	AFP2803 AFP2804	AFP2805	AFP2803 AFP2804	AFP2805	AFP2803 AFP2805
Interface	RS232C RS422	RS485	RS232C RS422	RS485	RS232C RS485
Communication method	Full duplex	Two-wire half duplex	Full duplex	Two-wire half duplex	Token passing (Floating master)
Synchronization	Start-stop synchronization				
Transmission line	Three-core or five-core shielded wire	Twisted-pair cable or VCTF	Three-core or five-core shielded wire	Twisted-pair cable or VCTF	Twisted-pair cable or VCTF
Transmission distance	15 m Length: 1,200 m max.	Length: 1,200 m max.	15 m Length: 1,200 m max.	Length: 1,200 m max.	1200m (RS485) 15m (RS232C)
Transmission speed (To be set in the system register)	300 to 230400bps	300 to 230400bps (19,200 bps when our C-NET adapter is connected)	300 to 230400bps	300 to 230400bps (19,200 bps when our C-NET adapter is connected)	115200bps
Transmission code	ASCII, JIS7, JIS8, and binary		ASCII, JIS7, JIS8		
Transmission format (To be set in the system register)	Data length: 7 bits/8 bits				
	Parity: 0/Invalid/Valid (Odd/Even)				
	Stop bit: 1 bit/2 bits				
	Start code: With STX / Without STX		—		
	End code: CR/CR+LF/Time setting/ETX		—		—
Number of stations	— (99 stations max. (32 stations max. when our C-NET adapter is connected))	— (99 stations max. (32 stations max. when our C-NET adapter is connected))	— (99 stations max. (32 stations max. when our C-NET adapter is connected))	— (99 stations max. (32 stations max. when our C-NET adapter is connected))	16 stations max.
PLC link capacity	—	—	—	—	Link relay: 1,024 points 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, FPMWIN-GR: Ver. 2.4 or later, EPWIN-PRO: Ver. 5.1 or later				

Note: 1) The protocol can be downloaded from: <http://www.mew.co.jp/ac/fasys/plc>

A: Available
N/A: Not available

■ Multi-wire link units

Item	FP2-MW (AFP2720)		
	W mode	W2 mode	F mode
Communication method	Token bus		
Transmission method	Base band		
Transmission speed	500k bit/s	500k bit/s, 250k bit/s	500k bit/s
Transmission distance	Extendable to 800 m	Extendable to 800 m 250 kbit/s: 1,200 m max. 500 kbit/s: 800 m max.	Extendable to 700 m
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.

■ S-LINK units

Item	S-LINK units FP2-SL2 (AFP2780)	CPU unit with S-LINK ports FP2-C1SL (AFP2214)
	1	2
Number of channels	128 points max.	128 points max. × 2
Number of I/O points	The number of input and output points for each channel can be selected by the switch in the unit body. Input: 0/32/64/96/128 points Output: 0/32/64/96/128 points	
Rated power supply voltage	+24 V DC ±10% Maximum allowable ripples (P-P): ±10% (S-LINK terminal block IN-24 V DC 1.6 A or less)	
Power consumption ^{note 1)}	[Current consumption of the S-LINK controller (incl. D-G line current consumption)] +24 V DC 1.6 A or less [Maximum allowable current supply (Supply to the S-LINK and I/O devices through the 24 V - 0 V line)] +24 V DC 5 A (Fuse: 5A or less)	
Transmission method	Bi-directional time division multiplex transmission	
Synchronization	Bit/Frame synchronization	
Transmission protocol	S-LINK protocol	
Transmission speed	28.5k bit/s	
Transmission distance ^{note 2)}	Main signal line: Extendable to 200 m (max. 400 m when a booster is used)	
FAN-OUT ^{note 2)}	320	
Connection method	T-branch multi-drop wiring or standard multi-drop wiring [+24, 0 V, D-G (with a function of D-G short-circuit protection)]	

Notes: 1) Refer to the "Power Capacity Determination" section of 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.

Specifications ③

■ Positioning units: RTEX (Network type) **NEW**

Item		2-axis type	4-axis type	8-axis type
Part No.		AFP243610	AFP243620	AFP243630
Model No.		FP2-PN2AN	FP2-PN4AN	FP2-PN8AN
Unit specifications	Position control function	Control method	PTP control, continuous path (CP) control	
		Interpolation control	Two/Three-axis linear interpolation, two-axis circular interpolation, three-axis helical interpolation	
		Unit of control	pulse/μm/inch/degree	
		Positioning data	600 points per axis	
		Backup	Parameters and data tables can be saved in FROM.	
		Acceleration/ deceleration method	Linear/S-curve acceleration and deceleration	
		Acceleration/ deceleration time	0 to 10,000 ms (in increments of 1 ms)	
	Positioning range	(-1073741823 to +1073741823 pulses) Increment/Absolute specification		
	Speed control function		Supported by a JOG operation (free-run operation)	
	Torque control function		Supported by a real-time torque control function	
Home return	Search method	Home proximity (DOG) search		
	Creep rate	Can be set freely		
Others		Pulser input operation supported		
		Auxiliary output code and auxiliary output contact		
		Dwell time		
		In-position contact		
Communication speed		100Mbps		
Cables		Commercially available LAN straight cable (Category 5e shielded cable)		
Connection system		Ring		
Communication cycle/ Number of connectable stations		0.5 ms, 8 axes max./system (Command cycle: 1 ms)		
Transmission distance		Between terminals: 60 m Total: 200 m		

■ Positioning units: Multifunction type (Pulse output type)

Item		AFP2432	AFP2433	AFP2434	AFP2435
		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	1 pps to 500 kpps (can set in 1 pps,)		1 pps to 4 Mpps (can set in 1 pps,)	
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 32767 ms (can set in 1 ms)			
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		0.02 ms or 0.005 ms 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	21.6 V DC to 26.4 V DC			
	Current consumption	50 mA	90 mA	50 mA	90 mA

Note: Previous FP2 positioning units AFP2430 (FP2-PP2) and AFP2431 (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
Part No.		AFP2441 (NPN) AFP2451 (PNP)	AFP2442 (NPN) AFP2452 (PNP)
Unit specifications	Insulation method	Photocoupler insulation	
	Rated voltage	24 V DC	
	Rated current	Approx. 7.5 mA (when using 24 V DC)	
	Input impedance	Approx. 3.2 kΩ	
	Usage voltage range	20.4 V DC to 26.4 V DC	
	Min. ON voltage/Min. ON current	19.2 V / 6 mA	
	Min. OFF voltage/Min. OFF current	5.0 V / 1.5 mA	
	Response time ^{note 1)}	OFF→ON	1 μs or less
		ON→OFF	2 μs or less
	Input time constant setting	None, 4μs, 8μs, 16μs, 32μs (set in 2-input units)	
Counter	Common method	16 points/common (+ common)	
	Number of counter channels	4 channels	
	Calculation range	32-bit with sign (−2,147,483,648 to +2,147,483,647)	
	Max. calculation speed ^{note 1)}	200 kHz	
	Input modes	3 modes (direction control, individual input, phase input)	
	Max. calculation speed ^{note 1)}	2.5 μs	
	Other	8 comparison outputs, multiplier function (1, 2, 4)	
	Number of interrupt points ^{note 2)}	None, 1/unit, 8/unit (set with mode setting switches)	
	Interrupt processing delays	160 μs max. (when using FP2 CPU unit) 50 μs max. (when using FP2SH CPU unit)	
	Insulation method	Photocoupler insulation	
Output specifications	Rated load voltage	5 - 24 V DC	
	Rated load voltage range	4.75 V DC to 26.4 V DC	
	Max. load current	0.1 A (A11 to A18, B11 to B14 pins), 0.8 A (B15 to B18 pins)	
	Leakage current when off	1 μA max.	
	Max. voltage drop when on	0.5 V max.	
	Response time	OFF→ON	1 μs max.
		ON→OFF	1 μs or less (NPN) 5 μs or less (PNP)
	Surge absorber	Zener diode	
	Common method	16 points/common	
	External power supply	Voltage	20.4 V DC to 26.4 V DC
Counter		Current ^(when using 24 V DC)	90 mA or less (NPN) 200 mA or less (PNP)
	Surge absorber	8 points (A11 to A18 pins)	
	Channels	4CH (B11 to B18 pins)	
	Max. output frequency	100 kHz	
	Output modes	2 modes (direction control, individual output)	
	Number of output points	4CH (B15 to B18 pins)	
	Max. load current	0.8 A	
	Cycle ^{note 3)}	1 Hz to 30 kHz	
	Duty ^{note 3)}	0 to 100% (unit: 1%)	

Notes:

- 1) This value is effective when the input time constant (filter) setting was set to "No setting".
- 2) If interrupts are used at the 1/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.

Product types

■ CPU units (Built-in RAM)

Product name		Operation speed	Built-in RAM	Optional memory		Other		Product number	Part number
FP2	Standard type CPU unit	From	Expansion RAM	ROM	IC memory card	Clock/calendar	Comment memory	FP2-C1	AFP2211
	CPU unit 64-point input	0.35 μs	16 k steps <small>(note 1)</small>	Available <small>(See below.)</small>	Available <small>(See below.)</small>	Not available	Available <small>(note 2)</small>	FP2-C1D	AFP2212
	CPU unit with S-LINK						Available <small>(note 3)</small>	FP2-C1SL	AFP2214
FPSH	Standard type CPU unit	From	60 k steps	Not available	Available <small>(See below.)</small>	Not available	Available <small>(Built-in)</small>	FP2-C2	AFP2231
	CPU unit with IC memory card interface	0.03 μs	60 k steps	Not available	Available <small>(Built-in)</small>	Available <small>(See below.)</small>	Available <small>(Built-in)</small>	FP2-C2P	AFP2235
CPU unit with IC memory card interface			120 k steps	Not available	Available <small>(Built-in)</small>	Available <small>(See below.)</small>	Available <small>(Built-in)</small>	FP2-C3P	AFP2235

Notes: 1) For FP2 CPU unit, the capacity can be expanded up to 32 k 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	Part number
Expansion memory unit	Comment input	Available	Available	Available	Not available	FP2-EM1	AFP2201
For FP2	Expansion memory unit	Available	Available	Available	Not available	FP2-EM2	AFP2202
F-ROM	Not available	Not available	Not available	Available	Available	FP2-EM3	AFP2203
EP-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. EP-ROM for program storage and ROM operation. Equivalent to M27C1001-12F1 A commercially available ROM writer is required.	Not available	Not available	Not available	Available	FP2-EM4	AFP2204
EP-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. EP-ROM for program storage and ROM operation. Equivalent to M27C2001-150F1. A commercially available ROM writer is required. Backup unnecessary. Perfect for program memory. Used for readout when using data memory. Perfect for data memory. Can also be used for program backup. Battery backups.	Not available	Not available	Not available	Available	FP2-EM5	AFP2205

■ Optional memories for FP2SH

Product name		Specification				Product number	Part number
Expansion memory unit	Comment input	Available	Available	Available	Not available	FP2-EM1	AFP2207
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.	Not available	Not available	Not available	Available	FP2-EM2	AFP2208
EP-ROM	EP-ROM for program storage and ROM operation. Equivalent to M27C2001-150F1. A commercially available ROM writer is required. Backup unnecessary. Perfect for program memory. Used for readout when using data memory.	Not available	Not available	Not available	Available	FP2-EM3	AFP2209
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.	Not available	Not available	Not available	Available	FP2-EM4	AFP2204
SRAM	SRAM for program storage and ROM operation. Equivalent to M27C1001-12F1 A commercially available ROM writer is required.	Not available	Not available	Not available	Available	FP2-EM5	AFP2205

Note: Please refer to "FP2 Product Types" for FP Memory Loader.

■ Backplane

Product name		Specification				Product number	Part number
Conventional type	Comment input	Available	Available	Available	Not available	FP2-BP05	AFP25005
H type	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.	Not available	Not available	Not available	Available	FP2-BP07	AFP25007
FP2 Expansion cable	EP-ROM for program storage and ROM operation. Equivalent to M27C2001-150F1. A commercially available ROM writer is required. Backup unnecessary. Perfect for program memory. Used for readout when using data memory.	Not available	Not available	Not available	Available	FP2-BP09	AFP25009
8 slots (for basic)	8 slots (for expansion)	Not available	Not available	Not available	Available	FP2-BP12	AFP25012
0.6 m	0.6 m	Not available	Not available	Not available	Available	FP2-BP14	AFP25014
2 m	2 m	Not available	Not available	Not available	Available	FP2-BP14M	AFP25014M
FP2-EC	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.	Not available	Not available	Not available	Available	FP2-EC	AFP25010EH
FP2-EC2	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.	Not available	Not available	Not available	Available	FP2-EC2	AFP2512

■ Power supply unit

Product name		Specification				Product number	Part number
DC input	Comment input	Available	Available	Available	Not available	FP2-PSA1	AFP2631
Input: 100 to 120 V AC, Output: 2.5 A	Input: 200 to 240 V AC, Output: 2.5 A	Not available	Not available	Not available	Available	FP2-PSA2	AFP2632
Input: 200 to 240 V AC, Output: 2.5 A	Input: 100 to 240 V AC, Output: 5 A	Not available	Not available	Not available	Available	FP2-PSA3	AFP2633
Input: 100 to 240 V AC, Output: 5 A	Input: 24 V AC, Output: 5 A	Not available	Not available	Not available	Available	FP2-PSD2	AFP2634

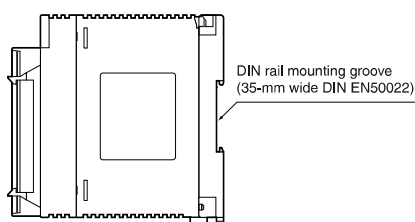
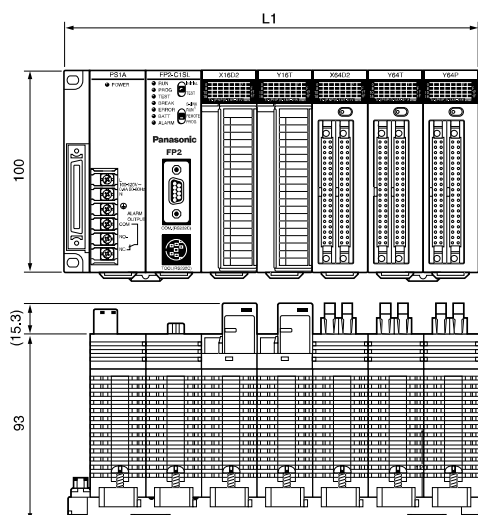
■ I/O units

Product name	Type	Number of point	Connection method	Specification	Product number	Part number
FP2 Input unit	DC input	16 points	Terminal	12-24V DC	FP2-X16D2	AFP23023
		32 points	Connector	24V DC	FP2-X32D2	AFP23064
	Relayoutput	64 points	Connector	24V DC	FP2-X64D2	AFP23067
		6 points	Terminal	5 A, 2 points per one common 2 A, 8 points per one common	FP2-Y6R	AFP23101
FP2 Output unit	Transistor output NPN	16 points	Terminal	0.5A (12-24V DC), 0.1A (5V DC)	FP2-Y16R	AFP23103
		32 points	Terminal	0.1A (12-24V DC), 50mA (5V DC)	FP2-Y16T	AFP23403
	Transistor output PNP	64 points	Connector	0.1A (12-24V DC), 50mA (5V DC)	FP2-Y32T	AFP23404
		16 points	Connector	0.1A (12-24V DC), 50mA (5V DC)	FP2-Y64T	AFP23407
	Transistor output PNP	32 points	Terminal	0.5A (12-24V DC), 0.1A (5V DC)	FP2-Y16P	AFP23503
		64 points	Connector	0.1A (12-24V DC), 50mA (5V DC)	FP2-Y32P	AFP23504
FP2 I/O mixed unit	DC input, Transistor output NPN	16 points	Connector	0.1A (12-24V DC), 50mA (5V DC)	FP2-Y64P	AFP23507
		32 points	Connector	Input 24 V DC, Output 0.1 A (12 to 24 V DC), 50 mA (5 V DC)	FP2-X164D2T	AFP23467
	DC input, Transistor output PNP	32 points	Connector	Input 24 V DC, Output 0.1 A (12 to 24 V DC), 50 mA (5 V DC) with on pulse catch input	FP2-XY64D2T	AFP23477
		64 points	Connector	Input 24 V DC, Output 0.1 A (12 to 24 V DC), 50 mA (5 V DC)	FP2-XY64D2P	AFP23567

FP2/FP2SH Dimensions

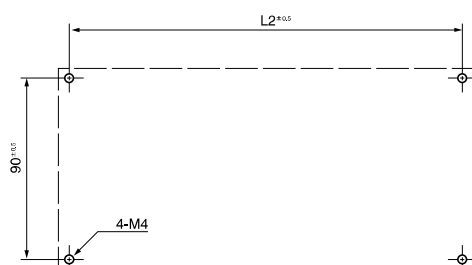
FP2/FP2SH

ARCT1B283E



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

Mounting dimension (Tolerance: ± 1.0)



● 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

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

● H type backplane

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

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