Panasonic
ideas for life

OVERVIEW

PROGRAMMABLE LOGIC CONTROLLERS

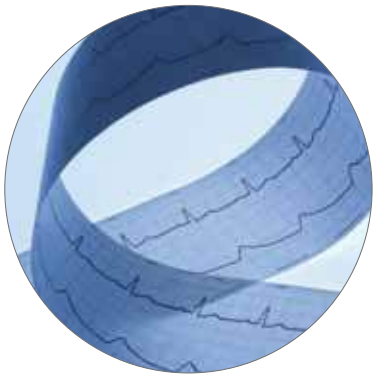
Advantages of PLC control

Powerful hardware solutions

Panasonic PLCs offer an outstanding price-performance ratio which incorporates numerous functions into a very compact body. Even in the smallest size they provide a powerful instruction set which allows the system to handle demanding tasks such as analog control, networking and positioning control.

Innovative programming software

Our PLC programming software Control FPWIN Pro was one of the first on the market conforming to the international standard IEC 61131-3.
Numerous libraries that incorporate a lot of our know-how ensure the reusability of ready-made functions and function blocks and save time for programming and debugging.



Long-life quality

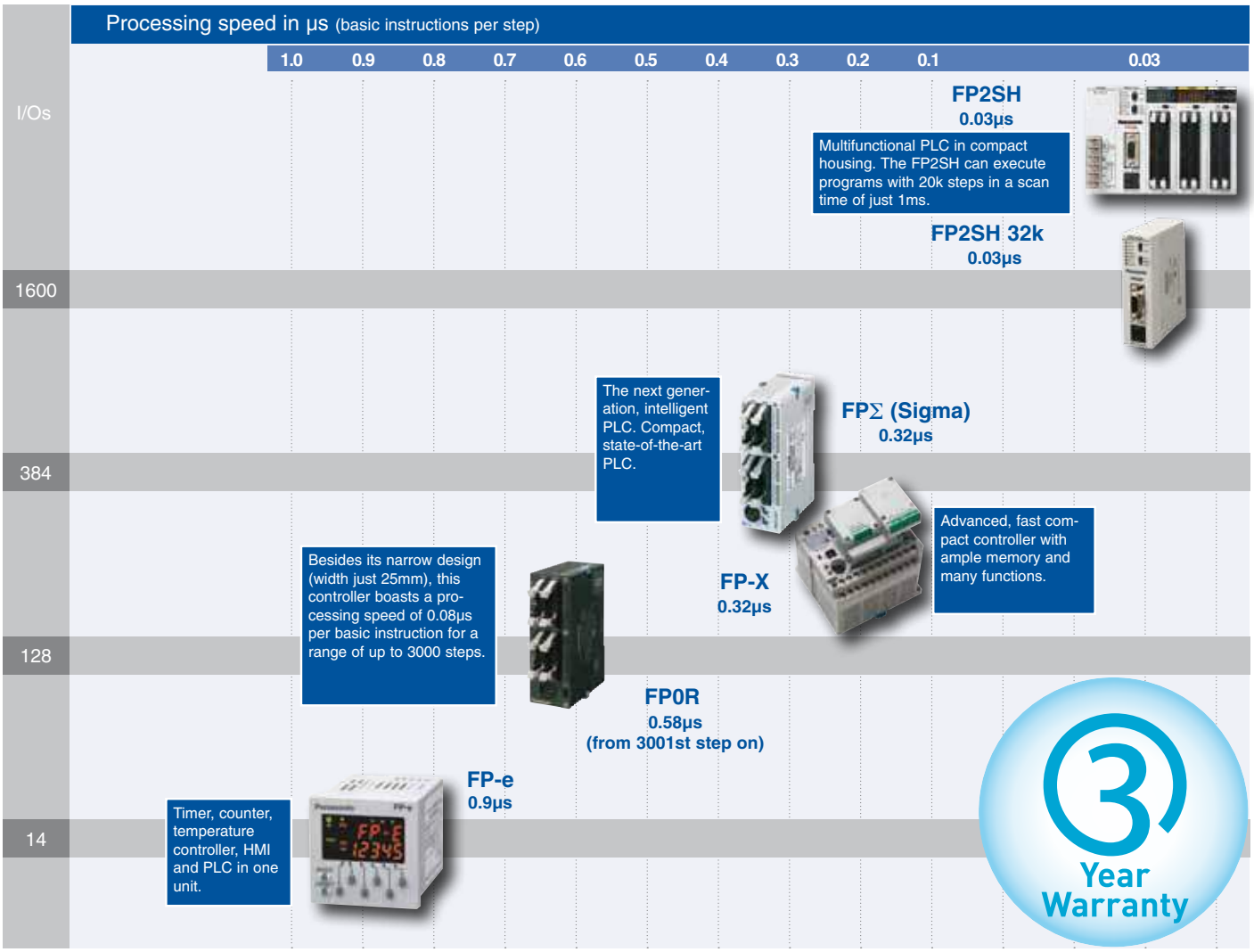
As with all Panasonic products, the PLCs undergo extremely rigorous testing during development that far exceeds the demands that will actually be placed on them. This is a guarantee for the long life of the product in the application.

Benefit from good service

In addition to a comprehensive PLC range, Panasonic also offers the high-quality care demanded from a service-oriented company certified according to ISO 9001.
Highly trained application engineers can provide custom designed systems. The sales staff regularly participates in hardware and software training courses.

Content

Overview

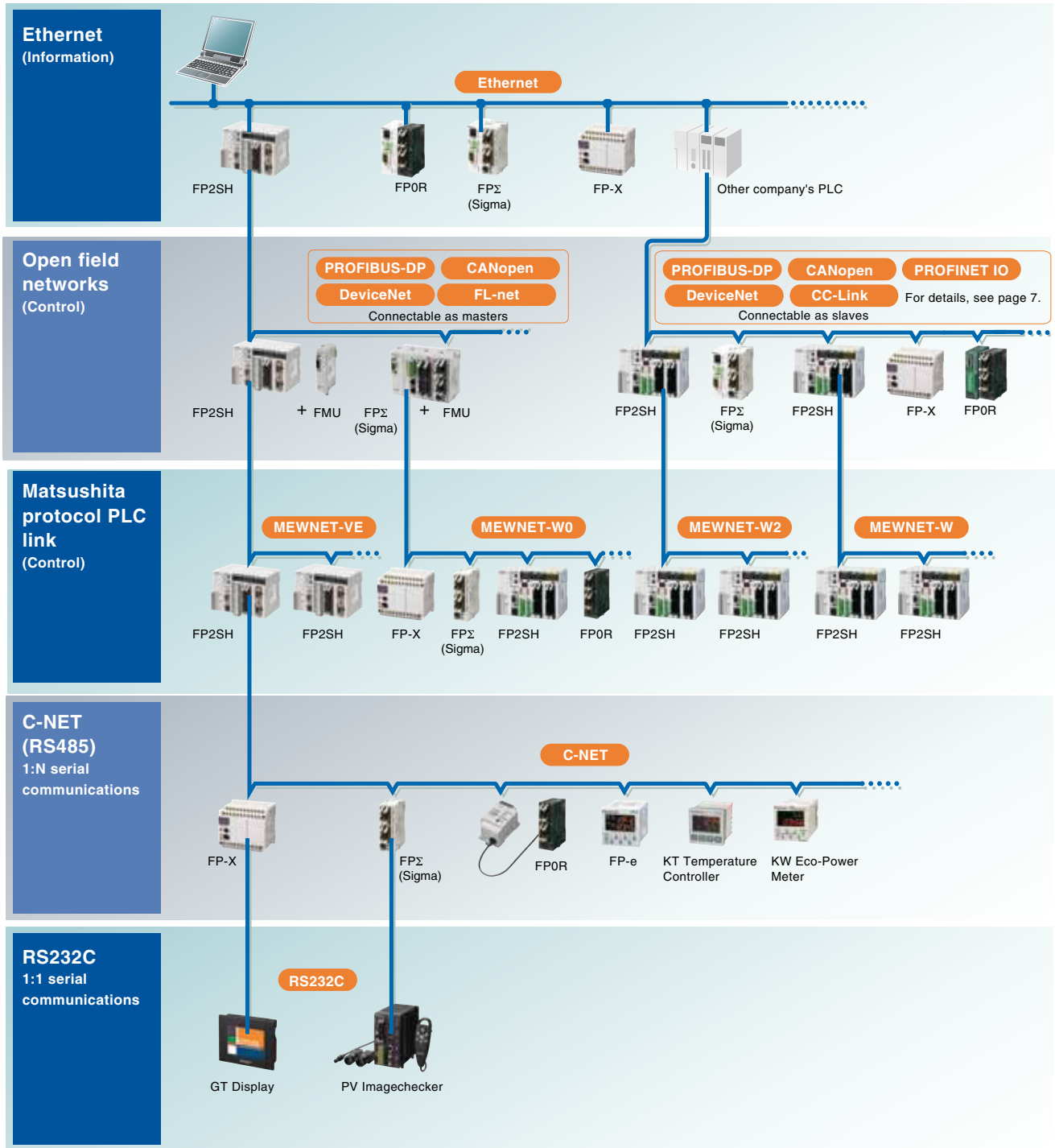


Selection of products

Model			FP-e		FP0R			FPΣ (Sigma)		
										
Features			PLC + Display + Switch • All-in-one controller with six functions • Mountable in a 48mm square cut in a panel • 14 I/O points (input: 8, output: 6) • Can serve as a temperature controller with a thermocouple input • Motor control by the built-in pulse output • Heater control by the PWM output • Serial communications by the RS232C/RS485 port		Pocket-size ultra-compact controller ideal for use in extremely narrow spaces • Ultra-high processing speed of 80 nsec/step within range of 0 to 3000 steps • Wide selection of program capacity from 16k to 32k steps • Wide selection of the number of I/O points from 10 to 128 • Up to 24 thermocouple inputs connectable for multipoint temperature control • Multi-axis control available without expansion units • Battery-less backup of all data			High performance ultra-compact controller reliably supports the control of higher speed equipment with more functions featured • Excellent basic performance, including program capacity of 32k steps, operation speed of 0.32μs/step and 384 I/O points • Built-in two-axis 100kHz pulse output capable of interpolation control • Positioning units capable of controlling network servomotors • Can be equipped with up to three ports for general-purpose serial communication without expansion unit • Compatible with PROFIBUS, DeviceNet, CANopen and other open field networks		
CPU (control unit) model			Basic type	Thermocouple input type	C10/C14/C16	C32	T32/F32	C24	C28	C32
Maximum controllable I/O points			14 points	12 points	106 to 112 points	128 points		376 points	380 points	384 points
Connectable expansion units			N/A		3 units			7 units (right: 3 left: 4)		
Program capacity			2.7k steps		16k steps	32k steps		32k steps		
Comment memory			N/A		A (built-in memory)			A (built-in memory)		
Operation speed			0.9μs/step (basic instructions)		0.08 - 0.58μs/step (basic instructions)			0.32μs/step (basic instructions)		
Data registers			1660 words		12k words	32k words		32,765 words		
Internal relays			1008 points (63 words)		4096 points (256 words)			4096 points (256 words)		
Network compatibility	Ethernet		A (with FP Web-Server 2)		A (with FP Web-Server 2)			A (with FP Web-Server 2)		
	PROFIBUS DP		N/A		Slave			A (master, slave)		
	DeviceNet		N/A		N/A			A (master, slave)		
	CANopen		N/A		N/A			A (master, slave)		
	PROFINET IO		N/A		N/A			A (slave)		
	Modbus-RTU		A (RS485 type)		A (RS232C)			A (communication cassette/unit)		
	CC-Link		N/A		A (slave, CC-Link unit)			A (slave, CC-Link unit)		
	Computer link (MEWTOCOL-COM)		A (Tool port, COM port)		A (Tool port, COM port)			A (Tool port, communication cassette)		
	Program controlled		A (COM port)		A (Tool port, COM port)			A (Tool port, communication cassette)		
	PLC Link	W	N/A		N/A			N/A		
		W0	N/A		A			A (RS485 communication cassette)		
		W2	N/A		N/A			N/A		
		VE	N/A		N/A			N/A		
	Remote I/O (MEWNET-F)		N/A		A (64-point slave stations, I/O link unit)			A (64-point slave stations, I/O link unit)		
	S-LINK		N/A		A (FP0-SL1 control unit)			A (S-LINK unit)		
Motor control	Built-in pulse output		2 axes/10kHz	2 axes/5kHz	4 axes/50kHz (C16,C32,T32, F32)			2 axes/100kHz (transistor output type)		
	Positioning unit		N/A		N/A			2-axis/4-axis type unit, up to 16 axes		
	PWM output		2 points/1kHz/1000 resolution		4 points/6Hz to 4.8kHz (C16, C32, T32, F32)			2 points/12kHz/1000 resolution (transistor output type)		
	High-speed counter		4 ch/10kHz	4 ch/5kHz	single phase: 6ch/50kHz; 2-phase: 3ch/15kHz			4 ch/50kHz		
Channels	Voltage/current input		N/A		8 ch/unit	2-ch input and 1-ch output mixed unit		8 ch/unit	2-ch input and 1-ch output mixed unit	
	Voltage/current output		N/A		4 ch/unit			4 ch/unit		
	Temperature input		N/A	2 ch (thermocouple)	8 ch thermocouple unit, 6 ch RTD unit			8 ch thermocouple unit, 6 ch RTD unit, 2 thermistor inputs on the CPU		
Calendar timer (clock function)			A (calendar timer type)		A (T32 only)			A		
Others			Front panel switch input: 8 points					Potentiometer input: 2 points		

Model			FP-X series										FP2SH			
			FP-X				FP-X0									
																
Features			High performance compact terminal-block type controller Wide selection of add-on cassettes allows space-saving use of the controller for a variety of purposes • Up to three add-on cassettes can be attached to the top of the control unit. The unit is of the terminal block type, but is space-saving and allows a variety of applications • Ethernet cassette available for data collection • Built-in four-axis pulse output. Two axes for linear interpolation • Comment memory for simple maintenance work • USB port for direct connection to a PC				Body equipped with combined relay and transistor output Super-high processing speed Number of I/O points expandable up to 216 max.						Scan time: 1ms/20k steps Advanced version of FP2 capable of ultra-high speed processing • Ultra-high speed model that shares units with FP2, ideal for high-speed control of electronic device manufacturing equipment • High program capacity of 120k steps • 32k, 60k step type also available • Compatible with Small PC Cards, which serve as a program backup or extended memory for processing a large volume of data • 8192 I/O points max. (remote I/O system)			
CPU (control unit) model			C14	C30	C38	C60	L14R	L30R	L40R	L40MR	L60R	L60MR	C2L	C2	C2P	C3P
Maximum controllable I/O points			328	352	360	382	14	30	40	40	60	60	2048 (8192 with remote I/O system)			
Connectable expansion units			8 units + add-on cassettes (up to 3)				N/A		3 units				32 units (when the H type backplane is used)			
Program capacity			16k steps	32k steps			2,5k		8k				32k / 60k / 120k steps			
Comment memory			A (built-in memory)				A (built-in memory)						A (built-in memory)			
Operation speed			0.32µs/step (basic instructions)				0.08µs/step (basic instructions)						0.03µs/step (basic instructions)			
Data registers			12,285 words	32,765 words			2500 words		8192 words				10,240 words (Exc. file register. See the end of this table.)			
Internal relays			4096 points (256 words)				1008 points		4096 points				14,192 points			
Network compatibility	Ethernet		A (Ethernet communication cassette, FP Web-Server 2)				A (FP Web-Server 2)						A (ET-LAN unit)			
	PROFIBUS DP		A (slave, FP0 DP-S unit)				A (slave, FP0 DP-S2 unit)						A (master, slave)			
	DeviceNet		N/A				N/A						A (master, slave)			
	CANopen		N/A				N/A						A (master, slave)			
	PROFINET IO		N/A				N/A						A (slave)			
	Modbus-RTU		A (communication cassette)				N/A			A	N/A	A	A (with library)			
	CC-Link		A (slave, FP0 CC-Link unit)				N/A						N/A			
	Computer link (MEWTOCOL-COM)		A (Tool port, communication cassette)				A						A (COM port, CCU, MCU)			
	Program controlled		A (Tool port, communication cassette)				A						A (COM port, SDU, MCU)			
	PLC Link	W	N/A				N/A						A (MW link unit)			
		W0	A (RS485 communication cassette)				N/A			A	N/A	A	A (MCU)			
		W2	N/A				N/A						N/A			
		VE	N/A				N/A						A (VE link unit)			
	Remote I/O (MEWNET-F)		A (64-point slave stations, FP0 I/O link unit)				A (FP0 I/O link unit)						A (Master: MW link unit) (Slave: RMS unit)			
	S-LINK		N/A				N/A						A (S-LINK unit)			
Motor control	Built-in pulse output		2 axes/100kHz + 2 axes/20kHz (transistor output type)				1 axis/ 20kHz	2 axes/ 20kHz	2 axis/50kHz				N/A			
	Positioning unit		1 axis/100kHz (pulse I/O add-on cassette)				N/A						RTEX, multifunction type, interpolation type			
	PWM output		4 points/12kHz/1000 resolution (transistor output type)				1-ch (1.6 kHz max.)	2-ch (1.6 kHz max.)	2-channel (3.0 kHz max.)				4 points/30kHz/100 resolution (Pulse I/O unit)			
	High-speed counter		8 ch/50kHz				4 ch/20kHz		4 ch/50kHz				4 points/200kHz (FP2-HSCT, FP2-PXYT)			
Channels	Voltage/current input		2 ch/cassette	2-ch input and 1-ch output mixed cassette			N/A		2-ch input/ voltage, poti a. thermistor)				8 ch (FP2-AD8VI, FP2-AD8X)			
	Voltage/current output		2 ch/cassette				N/A						4 ch (FP2-DA4)			
	Temperature input		2 ch thermocouple/input cassette				N/A		2-ch thermistor if voltage input not used				8 (FP2-AD8X, FP2-RTD)			
Clock/calendar function			A (MRTC cassette) / A (built-in type) for C38				N/A		A (built-in type)				A (built-in type)			
Others			With a USB port (C30/C60)										File register (32,765 words, 3 banks)			

Compatible network diagram



Compatible network table

Network		Applications and features	Trans-mission cable	Trans-mission speed	Trans-mission distance	Supported function				Compatible PLCs					
						PLC Link	Master/ Slave	Remote I/O systems	MEW-TOCOL-COM	FP2SH	FP-X	FP-X0	FPΣ (Sig-ma)	FP0R	FP-e
Ethernet		• Connection to PCs or workstations by a standard LAN, Ethernet • For data collection and operation control	UTP cable or transceiver cable	10Mbit/s / 100Mbit/s	Max. distance 100m	A	A	N/A	N/A	A	A (x1)	A (x1)	A	A	A
Open networks	CC-Link	• Capable of 10 Mbit/s high-speed or 1200m long distance communications	CC-Link dedicated cable (twisted pair cable)	10Mbit/s (100m) 5Mbit/s (160m) 2.5Mbit/s (400m) 625kbit/s (900m) 156kbit/s (1200m)		N/A	A	A	N/A	N/A	A	N/A	A	A	N/A
	PROFIBUS-DP	• One of the world's most popular open fieldbuses • 12Mbit/s high-speed communications • Transmission up to 12km is possible by using a repeater	Type A cable for PROFIBUS-DP (twisted pair cable)	12Mbit/s	12km when using a repeater	N/A	A	A	N/A	A (master/ slave)	A (x2)	A (x2)	A (master/ slave)	A (slave)	N/A
	DeviceNet	• Developed based on CAN, as popular as PROFIBUS. • Master-slave configuration as well as peer-to-peer configuration is possible	Dedicated 4-wire shielded cable (Thick/ Thin)	500kbit/s (100m) 250kbit/s (250m) 125kbit/s (500m)		N/A	A	N/A	N/A	A (master/slave)	N/A	N/A	A (master/ slave)	N/A	N/A
	CANopen	• As with DeviceNet, CAN-based industrial network • Widespread, particularly in Europe 128-station multi-master-slave communications	Twisted-pair shielded cable Also compatible with four-wire power bus cables	1Mbit/s (25m) to 10kbit/s (500m)		N/A	A	N/A	N/A	A (master/slave)	N/A		A (master/ slave)	N/A	N/A
	Profinet IO	• Real time, open industrial Ethernet communication • Three types are classified: IO controllers, IO devices and IO supervisors	Standard PROFINET Ethernet cable with standard RJ45 connector	Full duplex, 100Mbit/s		N/A	A (slave only)	N/A	N/A	A (device)	N/A		A (device)	N/A	N/A
PLC links	MEWNET-VE	• 10-Mbit/s high-speed large-capacity PLC link • 4 layers, 254 nodes, 8k-bit link relay, 8k-word link data	UTP-cable or transceiver cable	10Mbit/s	Max. distance 100m	A	N/A	N/A	N/A	A	N/A		N/A	N/A	N/A
	MEWNET-W0	• PLC link capable of mixed connection of FP2SH, FP2, FP-X, and FPΣ (Sigma) • Distributed control allows target PLCs to be selected	Twisted-pair cable	115 kbit/s	1200m	A	N/A	N/A	N/A	A	A	A (x3)	A	N/A	N/A
	MEWNET-W2	• 32 stations, 1200m max. • 4k bit link relay, 4k word link data	Twisted-pair cable	500kbit/s (800m) 250kbit/s (1200m)		A	N/A	N/A	N/A	A	N/A		N/A	N/A	N/A
	MEWNET-W	• 16 stations, 800m max. • 1k bit link relay, 128 word link data	Twisted-pair cable	500kbit/s	800m	A	N/A	N/A	N/A	A	N/A		N/A	N/A	N/A
Serial communications	C-NET (RS485)	• Capable of 1:N MEWTOCOL-COM connections) for small-size PLCs and other RS485 devices	VCTF or twisted-pair cable	19,200bit/s / 9600bit/s	1200m	N/A	A	N/A	A	A	A	A (x3)	A	A	A
	CCU (RS232C)	• 1:1 computer links (MEWTOCOL communications) by RS232C • For communications with GT Displays, PV Image-checker, etc.	RS232C	19,200bit/s / 9600bit/s	15m	N/A	A	N/A	A	A	A		A	A	A
	Modem (phone line)	• Capable of monitoring PLCs in remote locations or updating programs via the public telephone line	RS232C and phone line	56kbit/s	Up to 20km	A	A	N/A	A	A	A	N/A	A	A	A

Notes:
1) : FP Web-Server 2
2) : slave, FP0 DP-S unit
3) : for L40MR/L60MR

N/A: not available A: available

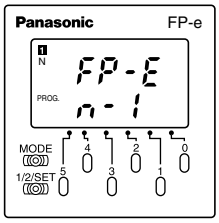
Timer, counter, hour meter, temperature controller & PLC in one unit

Features

- 5-character, 2-line, 3-color display
- Front operation switch
- Easy programming using wizard
- Smooth debug
- Panel mounted type

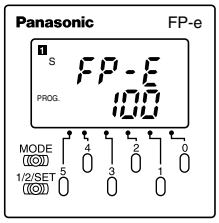
Display modes and functions

N mode
(Normal mode)



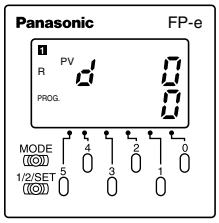
Displays any characters and numerical values, and numerical data can be changed.

S mode
(Switch mode)



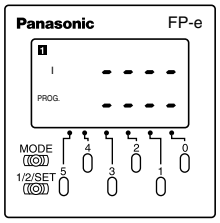
Can also display characters and numerical values. Operation switches can be used for input.

R mode
(Register mode)



Operation memory in the controller can be monitored and its data can be changed.

I mode
(I/O monitor mode)



I/O status (X, Y) in the controller can be displayed.

Specifications

Performance specifications

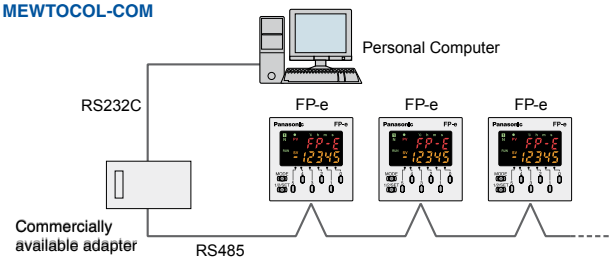
			AFPE224300 Basic type (RS232C)	AFPE224302 Basic type (RS485)	AFPE224305 RTC type (RS232C)	AFPE214325 Thermocouple input type (RS232C)	AFPE214322 Thermocouple input type (RS485)
Number of I/O points	Control unit		14 points [Input: 8, Output: 6 (Tr. NPN: 5/Ry: 1)]			12 points [Input: 6, Output: 6 (Tr. NPN: 5/Ry: 1)]	
	Front switch input		8 points				
Program memory	Built-in memory		Built-in EEPROM				
Program capacity			2720 steps				
Processing speed			0.9μs/step (for basic instruction)				
Clock/calendar function			–		Available (year, month, day, hour, minute, second and day of week). However, this can only be used when a battery has been installed.		–
Battery life			–		220 days or more (actual usage value: approx. 870 days (25°C) (Periodic replacement interval: 1 year) (Value applies when no power is supplied at all.)		–
Pulse catch input/ Interrupt input			6 points in total (X0 and X1: 50 μs, X2 to X5: 100 μs)				
COM port note			RS232C	RS485	RS232C	RS232C	RS485
Periodical interrupt			0.5ms to 30s				
Special functions	High speed counter * The combination of 1-phase x 2ch and 2-phase x 1ch is also possible for the high-speed counter		Counter mode: Addition/subtraction (1-phase) - input points: 4ch (max.)				
	Pulse output	Output points	2 independent points (Y0 and Y1) (No interpolation function)				
		Output frequency	40Hz to 10kHz (Y0/Y1: 1-point) 40Hz to 5kHz (Y0/Y1: 2-points)			40Hz to 5kHz (1-point) 40Hz to 2.5kHz (2-points)	
	PWM output	Output points	2 points (Y0 and Y1)				
		Output frequency	Frequency: 0.15Hz to 1kHz Duty: 0.1% to 99.9%				

Optimized for a wide range of applications

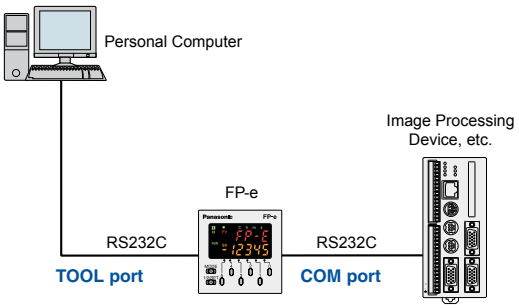
Equipped with RS485 and RS232C interfaces

Up to 99 MEWTOCOL-COM stations possible with RS485 (RS485 type)

Up to 32 computer link stations are possible using a C-NET adapter and up to 99 are possible using a commercially available adapter. You can easily monitor operation status or perform control.



With RS232C, communication possible with up to two ports (RS232C type)



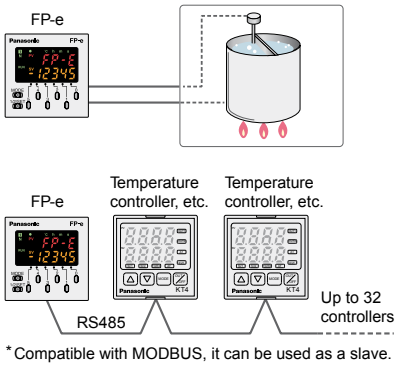
Can even handle temperature control

Two-point K-type thermocouple (-30 to 300°C) connection possible (equipped with thermocouple input)

Can be used in place of a temperature controller or used to control them.

As a temperature controller

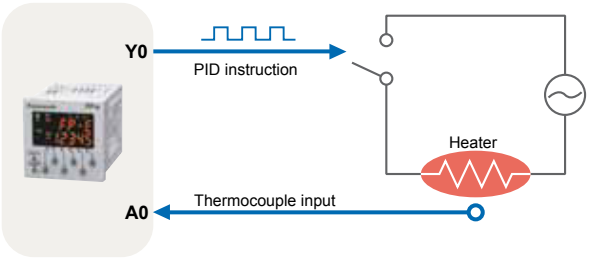
As a controller for temperature controllers



*Compatible with MODBUS, it can be used as a slave.

PID instruction function

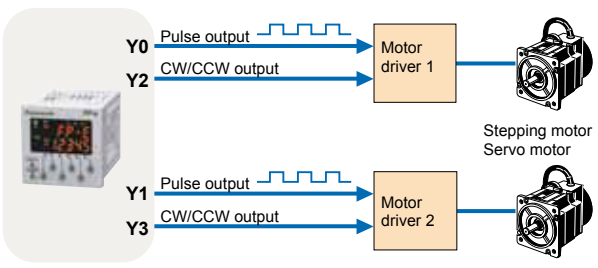
High-performance temperature control can be achieved with the PID instruction.



Equipped with high-speed counter for support of 2-axis independent positioning

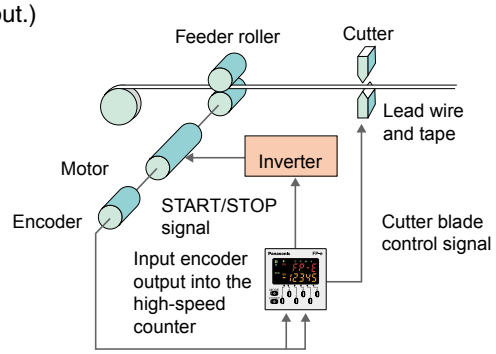
Pulse output function

The unit comes equipped with 2 channels for pulse output of up to 10kHz pulses. Since these two channels can be separately controlled, the FP-e is also suitable for 2-axis independent positioning.



High-speed counter function

In single phase, the 4-channel total is 10kHz, and in 2-phase the 2-channel total is 2kHz total speed, making the FP-e suitable for inverter control, etc. (One half for the type with thermocouple input.)




PROG.
Panasonic

FP0R series: The ultra-compact PLCs

Features

- Ultra high-speed processing enhances productivity
- An ultra high speed of 0.08µs/step for basic instructions for the first 3000 steps and 0.58µs/step thereafter. The FP0R is ideal for positioning and process automation applications, e.g. in labeling machines.
- Large programming capacity of 16k or 32k steps
- Generous data register of up to 12k or 32k words
- Independent comment memory for documenting purposes
- USB2.0 port provides high-speed program transfer
- The new F-type FP0R provides maintenance-free and complete backup of all data without requiring a battery. Industry's first!
- Highly advanced, built-in positioning functions for up to 4 axes (servo/stepping motor)
- Jog operation
- Individual settings for acceleration and deceleration for ramp functions
- Target speed can be changed by an external signal input during jog operation or trapezoidal control
- Can read encoder signals of up to 50kHz (pulse frequency measurement)
- 6-channel high-speed counters and 4-axis pulse outputs can be used simultaneously
- FP0R units provide various kinds of networking communication using a built-in interface or expansion units
- Ethernet (Modbus TCP/IEC60870)
- Profibus
- CC-Link
- MEWNET-W0
- C-NET
- RS232C + RS484 serial communication
- FP0R – same ultra compact size as FP0
- FP0R – fully compatible with FP0 units

Spezifications for the CPU types of the FP0R

CPU type	C10 series (relay output)	C14 series (relay output)	C16 series (transistor output)	C32 series (transistor output)	T32 series (transistor output)	F32 series (transistor output)
Number of inputs	6	8	8	16	16	16
Number of outputs	4 relay	6 relay	8 NPN/PNP	16 NPN/PNP	16 NPN/PNP	16 NPN/PNP
Output capacity	2A	2A	0.2A	0.2A	0.2A	0.2A
Digital I/O (max.)	106	110	112	128	128	128
Internal relays (R)	4096					
Processing speed	Up to 3000 steps: 0.08µs/step (basic instruction) After 3000 steps: 0.58µs/step (basic instruction)					
Program memory	EEPROM (no back-up battery required)					
Program capacity	16,000 steps			32,000 steps		
Data register (DT)	12,315 words			32,765 words		
Memory backup (Flash ROM)	Backup with F12, P13 instruction for all areas					
	Auto backup when power is off: Counters: 16 Internal relays: 128 Data register: 315 words					--
Memory backup (RAM)	--				Backup of the entire area by a built-in secondary battery	Backup of the entire area by FRAM (without the need for a battery)
High-speed counter	Single-phase: 6 channels (50kHz); 2-phase: 3 channels (15kHz)					
Pulse output	--		4 channels (50kHz), two channels can be controlled individually			
PWM output	--		4 channels (6Hz to 4.8kHz)			
RS232C interface	Up to two serial interfaces					
RS485 port	One RS485 port is mounted on each of C10MRS, C14MRS, C16MT, C16MP, C32MT, C32MP, T32MT, T32MP, F32MT, F32MP type (3P terminal block) Transmission speed (Baud rate): 19,200bits/s 115,200bits/s, Transmission distance: 1200m 9.843ft. Communication method: half duplex					
Clock/calendar function	--				Available	--
Other functions	Rewriting in RUN mode, download in RUN mode (incl. comments) 8-character password setting, and program upload protection					
Operating voltage	24V DC (± 10%)					

A wide variety of both single and combined units

Control units

Relay output type

10 points	
Input 6 points	Output 4 points
AFP0RC10RS AFP0RC10CRS with 2nd RS232C AFP0RC10MRS with RS485	

14 points	
Input 8 points	Output 6 points
AFP0RC14RS, AFP0RC14CRS with 2nd RS232C AFP0RC14MRS with RS485	

16 points	
Input 8 points	Output 8 points
AFP0RC16P (PNP), AFP0RC16T (NPN) AFP0RC16CP (PNP), AFP0RC16CT (NPN) with 2nd RS232C AFP0RC16MT, AFP0RC16MP with RS485	

Transistor output type

32 points	
Input 16 points	Output 16 points
AFP0RC32P (PNP), AFP0RC32TC (NPN) AFP0RC32CP (PNP), AFP0RC32CT (NPN) with 2nd RS232C AFP0RC32MT, AFP0RC32MP with RS485	

32 points (T-type)	
Input 16 points	Output 16 points
AFP0RT32CP (PNP), AFP0RT32CT (NPN) with 2nd RS232C AFP0RT32MT, AFP0RF32MT with RS485	

32 points (F-type)	
Input 16 points	Output 16 points
AFP0RF32CP (PNP), AFP0RF32CT (NPN) with 2nd RS232C AFP0RT32MP AFP0RF32MP with RS485	

FP Memory Loader

AFP8670

- Read or write programs(up to 60k steps) from or to a PLC
- Personal computer is not required
- Applicable with FP0R, FP-e, FPΣ (Sigma), FP-X and FP2SH

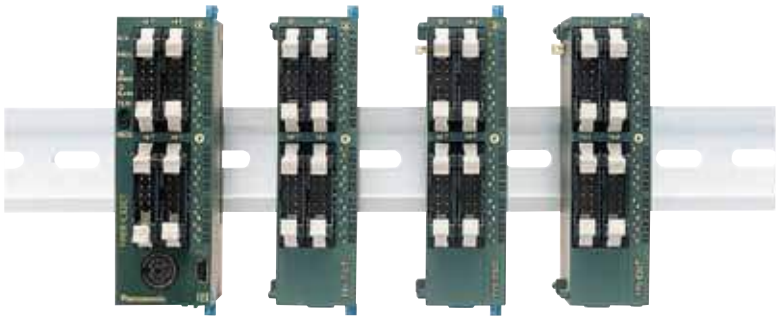
S-LINK MASTER CPU

FP0-SL1

- Control of 64 input and 64 output points is possible with one unit
- Simple connection of S-LINK I/O devices
- Sensors can be easily connected with plug-in connections

Up to three expansion units can be directly connected without connection cables

The expansion unit can be attached easily without any cables to the control unit. Special expansion cables, backplanes, and so forth, are unnecessary as the expansion unit employs a stacking system that uses expansion connectors and lock levers on the surface of the unit itself.



A maximum of 3 expansion units can be added to the control unit

Digital I/O units

Relay output type

8 points	
Input 4 points	Output 4 points
AFP0RE8RS	

16 points	
Input 8 points	Output 8 points
AFP0RE16RS	

32 points	
Input 16 points	Output 16 points
FP0-E32RS	

8 points
Output 8 points
AFP0RE8YRS

Input only type

8 points
Input 8 points
AFP0RE8X

16 points
Input 16 points
AFP0RE16X

Transistor output type

8 points
Output 8 points
AFP0RE8YP (PNP) AFP0RE8YT (NPN)

16 points	
Input 8 points	Output 8 points
AFP0RE16P (PNP) AFP0RE16T (NPN)	

16 points
Output 16 points
AFP0RE16YP (PNP) AFP0RE16YT (NPN)

32 points	
Input 16 points	Output 16 points
AFP0RE32P (PNP) AFP0RE32T (NPN)	

Analog I/O units

3 points	
Input 2 points	Output 1 point
FP0-A21	

- Input (12 bit): ± 10V, 0 – 5V, 0 – 20mA
- Output (12 bit): ± 10V, 0 – 20mA

4 points
Output 4 points
FP0-A04I

– / – / 4 – 20mA

4 points
Output 4 points
FP0-A04V

– / – / ± 10V

8 points
Input 8 points
FP0-A80

± 10V, ± 100mV
0 – 5V, 0 – 20mA
–

Temperature control units

4 points
Input 4 points
FP0-TC4

- K, J, T, R type thermocouples can be used
- Resolution: 0.1°C
- Accuracy: 0.8°C (R type: 3°C)
- Temperature range: -100 to 1500°C

8 points
Input 8 points
FP0-TC8

6 points
Input 6 points
FP0-RTD6

- Pt100, Pt1000, Ni1000
- Temperature range: -200 to 500°C

Networking units

Ethernet
FPWEB2
(Web-Server unit)
FPWEBEX
(Web-Expansion)

PROFIBUS
FP0-DPS2
(DP slave)

FP Modem-56k
(FP analog modem)

Add-on unit

Switch 2A loads within the network

Switch electrically insulated loads of AC 250VAC reliably using the FP0 Relay Terminal FP0-RT8Y-6A directly within the network.

The FP0-RT8Y-6A unit provides reliable insulation between peripheral equipment and the PLC system, even for large electrical loads.
Standardized MIL connectors establish a direct connection to the FP0 unit. Thereby the FP0 can act as decentralized intelligence on site and be placed directly next to the power element of the machine – be it the motor, a protective device, a magnetic valve, etc.

Many more connection products are available, please refer to "Panasonic connection technology for PLC" catalog

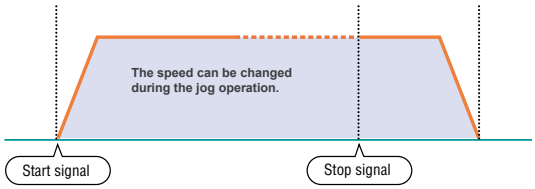
Specifications FP0-RT8Y-6A

Item		Description
Rated operating voltage		24V DC
Operating voltage range		21.6V DC to 26.4V DC
Power consumption		Max. 100mA (at 24V DC)
Over voltage protection		Surge absorber
Connection method		With spring cotter via flat cable to FP0-C16P/C16CP/C32P/C32CP/T32CP/E8YP/E16YP/E16P/E32P
Contacts		
Contact type		1 normally open contact
Contact class		II according to VDE 0435 Section 120
Connection method		MC connector (for conductor cross-sections up to 2.5mm²)
Rated resistive load		250V AC, 30V DC
Limiting continuous current		2A/output (at max. ambient temperature)
Startup	„0" → „1"	Typical 8ms
	„1" → „0"	Typical 4ms
Limiting continuous current	mechanical	Approx. 5 x 10^6 switching cycles
	electrical	Rated load 2A, 230V AC, 5 x 10^4 switching cycles
		Motor load 230V AC, surge current 1A, cos φ0.4
General		
Overvoltage category		III
Pollution degree		2
Ambient temperature		0 – 55°C

FP0R positioning

Jog positioning control (F171 instruction)

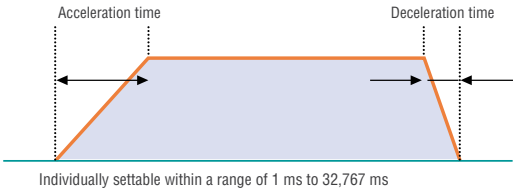
Motion can be started without a preset target value. When a stop signal is input, the target value is set, and the motion is slowed to a stop.



Useful for

- Labelers: Stopping the motion at a constant distance from the point where a label end detection signal is triggered
- Processing machines: Stopping the motion at a constant distance from the point where a processing object edge detection signal is triggered, and cut/drill the object

Individual settings for acceleration and deceleration (F171, F172, F174, and F175 instructions)



Useful for

- Labelers: Starting the operation at a relatively low acceleration to prevent tape from breaking
  Stopping the operation at high deceleration when detecting the label end to save the tape

Changing the speed (F171 and F172 instructions)

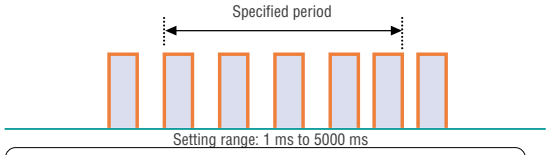
The target speed can be changed by an external signal input during the jog or trapezoidal control operation.

Useful for

- Speed synchronization of transfer/processing equipment

Measuring the pulse frequency (F178 instruction)

Pulses input in a specified period by a single instruction are counted, and the frequency is calculated.

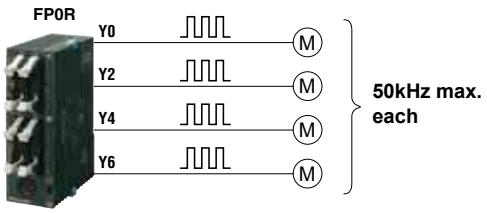


Useful for

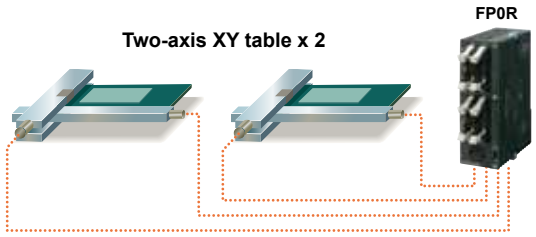
- Detection of motor rotation speed for encoder feedback control

Built-in 4-axis pulse outputs (Transistor output type)

Multi-axis (4-axis) control is available without expansion units.

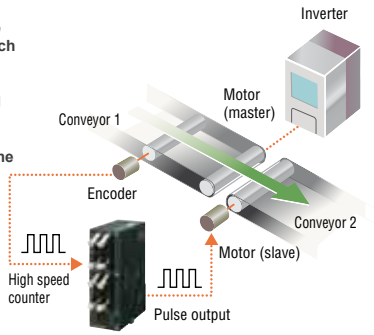


Two sets can simultaneously undergo two-axis linear interpolation (F175 instruction).



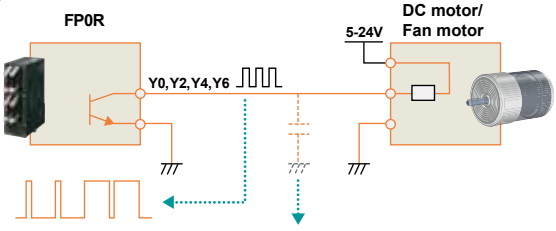
Simultaneously usable high speed counters (6 channels) and pulse outputs (4 channels)

The right-hand figure, the speed of conveyor 1, which is inverter-controlled, is measured based on the encoder pulse count, and pulses are output to the slave motor (for jog operation) according to the measured speed in order to synchronize the speed of conveyor 2.



Built-in multipoint PWM outputs (4 channels)

A single FP0R unit can control the speeds of up to six DC motors/fan motors. It also can serve as an analog voltage output unit.



The speed can be controlled by changing the ON width of the PWM output within a range of 0.1% to 99.9%.

The unit can also serve as an analog voltage output unit (resolution: 1/1000) when a smoothing capacitor is inserted in the circuit.


X0-7
X8-F
RUN
PROG.
ERROR
ALARM
RUN
PROG.
Y0-7
Y8-F
COM.1
S
R
COM.2
S
R
FPΣ
max.
V0
min.
V1
Panasonic
0 1 2 3 4 5 6 7
8 9 A B C D E F

FPΣ (Sigma): The next generation compact PLC

Features

- Abundant program capacity – 32k steps
- The 32k step program capacity can accommodate an in-crease in the number of programs accompanying functionality enhancements, expansions, or changes of equipment.
- Equipped with an independent comment memory
- All of 100,000 I/O comments, 5000 lines of line-space comments, and 5000 lines of remark comments are saved in FPΣ (Sigma) together with programs.
- Equipped with a high-speed RISC processor
  Equipped with an RISC processor, achieving high-speed processing with a scan time of less than 2ms for 5000 steps.
- High-speed positioning unit
  The 4Mbps maximum frequency and startup speed of 0.005ms allow use for linear servo control.
- Simple temperature control
  A temperature control program can be written in only one line by using the PID F356 (EZPID) instruction, facilitating temperature control by a PLC, which had previously been considered difficult.

Performance specifications

Part number	32k type	FPG-C32T2H FPG-C32T2HTM	FPG-C24R2H FPG-C24R2HTM	FPG-C28P2H FPG-C28P2HTM
Number of I/O points	Control unit	32 points (DC input: 16, NPN output: 16)	24 points (DC input: 16, relay output: 8)	28 points (DC input: 16, PNP output: 12)
	With FP0R expansion units	Max. 128 points (up to 3 units) when using transistor output type expansion units	Max. 120 points (up to 3 units) when using transistor output type expansion units	Max. 124 points (up to 3 units) when using transistor output type expansion units
	With FPΣ (Sigma) expansion units	Max. 288 points (up to 4 units) when using transistor output type expansion units	Max. 280 points (up to 4 units) when using transistor output type expansion units	Max. 284 points (up to 4 units) when using NPN output type expansion units
	With FP0R and FPΣ (Sigma) expansion units	Max. 384 points when using transistor output type expansion units	Max. 376 points when using transistor output type expansion units	Max. 380 points when using NPN output type expansion units
Programming method/ Control method		Relay symbol/cyclic operation		
Program memory		Built-in flash ROM (without backup battery)		
Program capacity		32k steps (32k type)		
Number of instructions	Basic	93		
	High-speed	218	216	218
Operation speed		Basic instruction: 0.32μs/step (32k type)		
Operation memory points (Relay)	Internal relays (R)	4096 points (32k type): R0 to R255F		
	Timers/counters (T/C)	1024 points [1) 2)] (factory settings: timers: 1008 points (T0 to T1007), counters: 16 points (C1008 to C1023) Timer: counts in units of up to 32767 times (units: 1ms, 10ms, 100ms, or 1s). Counter: Counts 1 to 32,767		
	Link relays (L)	2048 points (32k type)		
Operation memory points (Memory area)	Data registers (DT)	32,765 words (DT0 to DT32764) [1)]		
	Link data registers (LD)	256 words (32k type)		
	Index registers (IX,IY)	14 words (I0 to ID)		
Master Control Relay points (MCR)		256		
Labels (JMP + LOOP)		256		
Differential points		Unlimited		
Number of step ladder		1000 stages		
Number of subroutines		100		
Pulse catch input		8 points (X0 to X7)		
Interrupt program		9 programs (8 external input points (X0 to X7), 1 periodical interrupt point '0.5ms to 30s')		
Self-diagnostic function		E. g. watchdog timer, program syntax check		
Clock/Calendar function		Available (year, month, day, hour, minute, second and day of week); however, this function can only be used when a battery has been installed [3)].		
Potentiometer (Volume) input		2 points, resolution: 10 bits (K0 to K1000)		
Battery life		220 days or more (actual usage value: approx. 840 days (25°C). Suggested replacement interval: 1 year. Value applies when no power at all is supplied.		
Comment storage		All kinds of comments, including I/O comments, remarks and block comments, can be stored (without backup battery).		
Link function		Computer Link (1:1, 1:N) [4)] General-purpose communication (1:1, 1:N) [4) 5)] PLC Link [6)]		
Other functions		Online editing, constant scan, forced on/off, password, floating-point operation and PID processing		
Linear/Circular interpolation for positioning		Available	Not available	Available

Notes: 1) If no battery is used, only the fixed area is backed up (counters 16 points: C1008 to C1023, internal relays 128 points: R900 to R97F, data registers 55 words: DT32710 to DT32764). When the optional battery is used, hold-type data can be backed up. Areas to be held and not held can be specified using the system registers.
2) The number of points can be increased by using an auxiliary timer.
3) Precision of clock/calendar function:
- At 0°C 32°F, less than 119 seconds error per month.
- At 25°C, less than 51 seconds error per month.
- At 55°C, less than 148 seconds error per month.

4) An optional communication cassette (RS232C type) is required in order to use 1:1 communication.
5) An optional communication cassette (RS485 type) is required in order to use 1:N communication.
6) An optional communication cassette (RS485 type) is required. The number of points actually available for use is determined by the hardware configuration.

Control units: Outstanding performance in a compact design

FPΣ – Transistor output type

28 points	
Input 16 points	Output PNP 12 points
MIL connector type FPG-C28P2H	

32 points	
Input 16 points	Output NPN 16 points
MIL connector type FPG-C32T2H	

FPΣ – Relay output type

24 points	
Input 16 points	Output relay 8 points
Screw terminal type FPG-C24R2H	

FPΣ – Transistor output type with thermistor input

28 points	
Input 16 points	Output PNP 12 points
2 thermistor inputs FPG-C28P2HTM	

32 points	
Input 16 points	Output NPN 16 points
2 thermistor inputs FPG-C32T2HTM	

FPΣ – Relay output type with thermistor input

24 points	
Input 16 points	Output relay 8 points
2 thermistor inputs FPG-C24R2HTM	

High expansion capability

FPΣ can use the expansion units of the FP0R on the right-hand side. New FPΣ units can be added to the left hand side.

Max. 4 expansion units each 64 I/Os = 256 I/Os

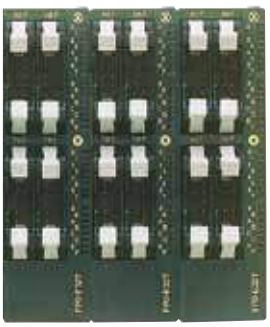
…up to 384 I/O!

Control unit max. 32 I/Os

Max. 3 expansion units each 32 I/Os = 96 I/Os

Parallel expansion BUS

Serial expansion BUS



Expansion units: Wide variety – left side

FPΣ
I/O expansion unit

64 points	
Input 32 points	Output (PNP) 32 points
MIL connector type FPG-XY64D2P	

FPΣ
I/O expansion unit

64 points	
Input 32 points	Output (NPN) 32 points
MIL connector type FPG-XY64D2T	

FPΣ
Memory expansion unit

FPG-EM1
Memory: 256k words FPG-EM1

FPΣ
Analog unit

8 points	
Input 4 points	Output 4 points
MIL connector type FPGAD44D50(with 50Ω) FPGAD44D250 (with 250Ω)	

- Input (16 bit): 0 – 10V, 0 – 20mA
- Output (12 bit): 0 – 10V, ± 10V, 4 – 20mA

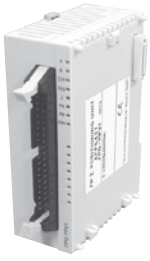
FPΣ positioning expansion units RTEX
Real-time Ethernet system for Minas A5N servo drives

2-axis
FPG-PN2AN

4-axis
FPG-PN4AN

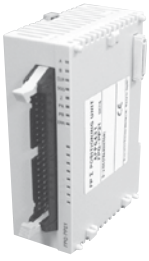
8-axis
FPG-PN8AN

FPΣ positioning expansion units

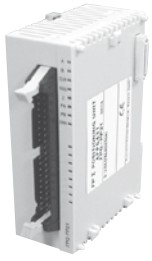


1-axis
Transistor output FPG-PP11

1-axis
Line driver output FPG-PP12



2-axis
Transistor output FPG-PP21



2-axis
Line driver output FPG-PP22

Expansion units left side: Network units

FPΣ Fieldbus master expansion units

PROFIBUS Master
FPG-DPV1-M

CANopen Master
FPG-CAN-M

DeviceNet Master
FPG-DEV-M

S-Link Master
FPG-SL

FPΣ Fieldbus slave expansion units

CC-Link Slave
FPG-CCLS

PROFIBUS Slave
FPG-DPV1-S

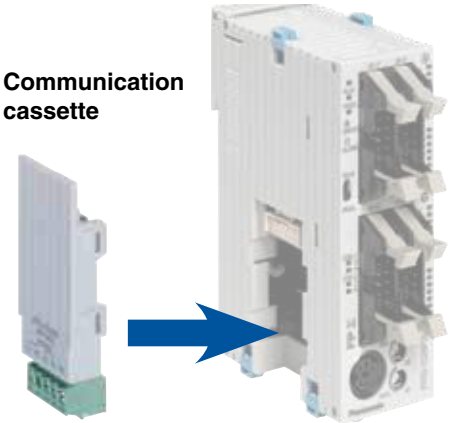
DeviceNet Slave
FPG-DEV-S

CANopen Slave
FPG-CAN-S

PROFINET I/O Slave
FPG-PRT-S

BACnet Slave
FPG-BACIP-S FPG-BACMSTP-S

Communication cassette



Communication Cassette	
FPG-COM1:	1 channel RS232C
FPG-COM2:	2 channels RS232C
FPG-COM3:	1 channel RS485
FPG-COM4:	1 channel RS232C & 1 channel RS485

Other network units

Ethernet
FPWEB2 FPWEBEXP

FP Modem 56k
FP Modem-56k

3channel RS485
AFPG951T34

Analog value processing:
Analog units FPGAD44D50 / FPGAD44D250

Features

- Multimode A/D or D/A conversion. Voltage or current can be set separately for each channel.
- 4 analog inputs (current input: 50Ω input impedance, FPGAD44D50) 4 analog inputs (current input: 250Ω input impedance, FPGAD44D250) – standard 0 to 10V or 0 to 20mA
- 4 analog outputs: -10V to +10V, 4 to 20mA
- High resolution: 16-bit input and 12-bit output
- Fast conversion speed: Inputs: 10ms / 4 channels: outputs: 10ms / 4 channels
- MC terminal type connector

General specifications

	Description
Rated voltage	24VDC
Operating voltage	21.6 to 26.4VDC
Current consumption	< 100mA
Ambient temperature	0°C to +55°C
Storage temperature	-20°C to +70°C
Size	90 x 30 x 60mm (W x L x H)
Weight	150g

Analog input specification

Article no.		FPGAD44D50	FPGAD44D250
No. of channels		4 channels/unit	
Input range	Voltage:	0 to 10V	
	Current:	0 to 20mA	
Digital value		0 to 10V, 0 to 20mA; K0 to K65535	
Resolution		16-bit (1/65536)	
Conversion speed	Voltage:	10ms / 4 channels	
	Current:		
Accuracy	Voltage:	0.1% at 25°C, 1% at 55°C	
Input impedance	Voltage:	100kΩ	–
	Current:	50Ω	250Ω
Max. input range	Voltage:	+15V	
	Current:	+30mA	
Insulation method		Between analog input terminals and FPΣ circuit: Optocoupler (no isolation between channels)	

Analog output specifications

Article no.		FPGAD44D50	FPGAD44D250
No. of channels		4 channels/unit	
Output range	Voltage:	0 to 10V, -10V to +10V	
	Current:	4 to 20mA	
Digital value		4 to 20mA, 0 to 10V; K0 to K4095	
		-10V to +10V; K-4095 to K4095	
Resolution		12-bit (1/4096) plus sign	
Conversion speed		10ms / 4 channels	
Accuracy	Voltage:	0.1% at 25°C	
	Current:	0.3% at 25°C, 3% at 55°C	
Input impedance	Voltage:	100kΩ	–
	Current:	50Ω	250Ω
Permissible load resistance		Current: < 300Ω	Voltage: > 1kΩ
Insulation method		Between analog input terminals and FPΣ circuit: Optocoupler (no isolation between channels)	

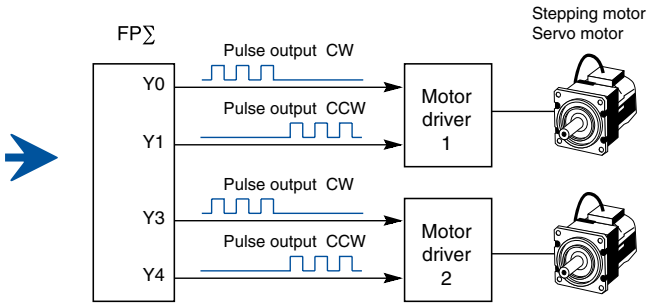
Specially designed for positioning application

Max. 100kHz pulse output performance is now standard.
Powerful device capable of linear interpolation and circular interpolation.

Pulse output max. 100kHz

Because command processing at speeds up to 100kHz is available, high-speed, high-precision positioning is enabled. Along with stepping motor control, the specs also ensure plenty of scope for controlling servo motors.

Possible to combine with pulse-train input drivers.
Single unit enables two-axis control.

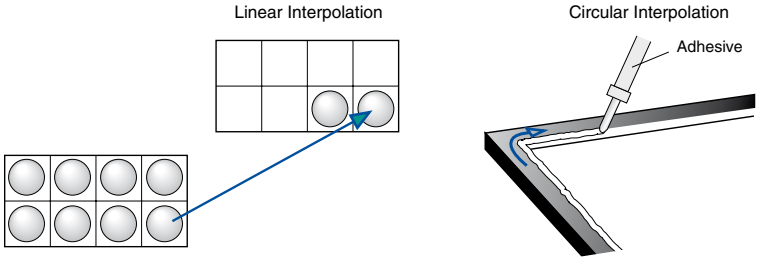


Rapid 0.02ms start (when JOG operation controls are executed)

The time taken to execute the JOG operation, from the instant the trigger (execution condition) goes on to the time of pulse output, is 0.02ms and 0.2ms even with trapezoidal control. Control time is reduced even for machines that quickly and repeatedly restart.

Linear interpolation and circular interpolation are built in (FPG-C32T2H-A and FPG-C28P2H-A)

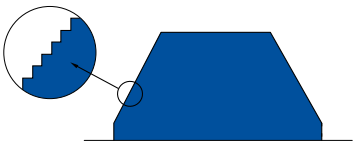
Interpolation functions enable simultaneous control of two axes. Applications that a compact PLC couldn't previously cope with are no longer a challenge.



And there's more:

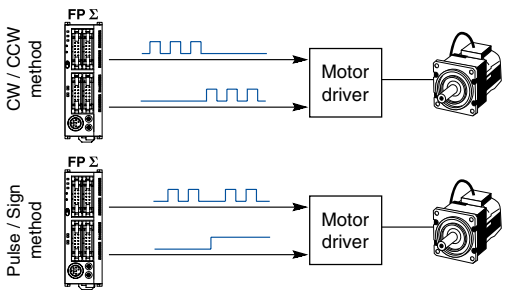
Smooth acceleration/deceleration

You can choose to set either 30 or 60 steps of acceleration/ deceleration. This feature means you can achieve smoother movement during long acceleration/ deceleration periods of stepping motors.
Settings allow a maximum 60 accelaration/deceleration steps.



Support for CW/CCW method

Reduce overall costs by designing systems that combine with servo motors and small stepping motors without support for Pulse and Sign method.



High-speed, high-precision positioning

Programming with convenient and easy-to-understand instructions

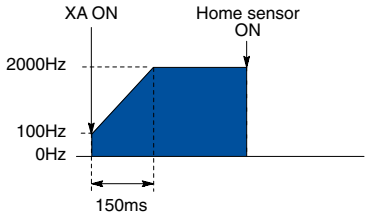
- Uses a preset value table for starting speed, target speed, acceleration/deceleration time, and other factors. Easy-to-understand programming is possible since numbers can be specified intuitively.
- Comes with dedicated instructions for each mode: trapezoidal control, home return, JOG operation, free table operation, linear interpolation and circular interpolation.

Selectable home return mode

- The home return method may be specified even in situations such as when only a single sensor is being used, depending on the design.
- When the home position return is completed, a deviation counter clear signal can also be output.

Home position return

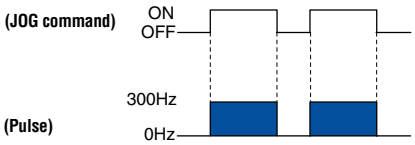
- Pulse output diagram (when the near home input is not used).



Home search automatically reverses the motor rotation when the positive or negative limit switch is reached and searches for the home position or near home position.

JOG operation

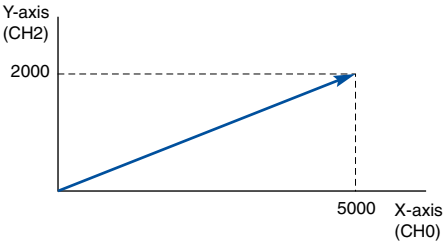
- Pulse output diagram.



This refers to an operation in which the motor is rotated only while operation commands are being input. This is used to forcibly rotate the motor using input from an external switch, for instance when making adjustments. Depending on the circumstances, unlimited feeding can be accomplished with the JOG operation.

Linear interpolation

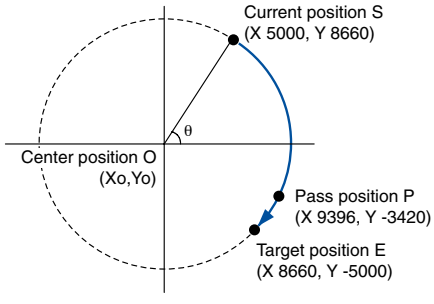
- Positioning locus.



A control function that automatically defines the continuum of points in a straight line based on only two coordinate positions.

Circular interpolation

- Positioning locus.
- Pass and center position methods are available.



Allows points to be smoothly traversed by arced paths for which the user specifies the orientation plane, the radius of curvature, motion path profile and direction of motion.

Precise positioning

Features

- Fast startup of 0.02 or 0.005ms makes cycle time reduction possible
- Feedback pulse count function makes output pulse counting from external encoders possible
- JOG positioning control supports a wide range of applications
- 4 types of S-curve acceleration/deceleration control makes smooth startup and stopping possible: Sine curve, quadratic curve, cycloid curve and cubic curve

FPG-PP11

FPG-PP12

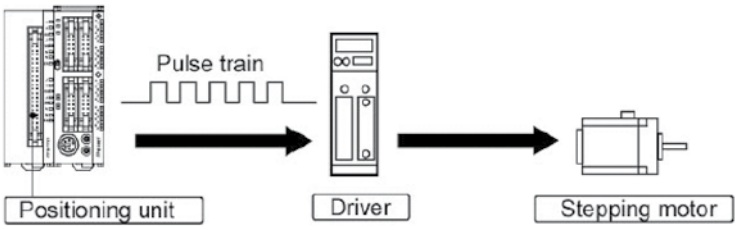
FPG-PP21

FPG-PP22

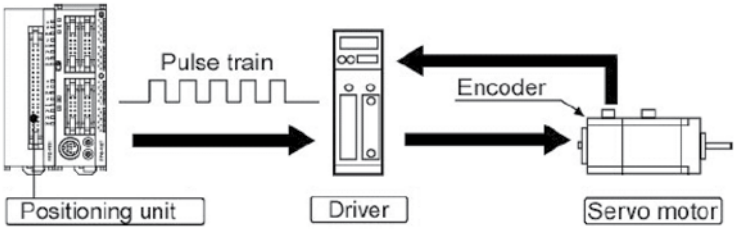
- The FPΣ (Sigma) positioning unit can handle simultaneous startup of multiple axes, enabling simultaneous control of linear interpolation and other elements through user programs
- Transistor output type (open collector) and line driver output type are available

Unit type and product number		
Type	**Output type**	**Part number**
1-axis type	Transistor output type	FPG-PP11
2-axis type	Transistor output type	FPG-PP21
1-axis type	Line driver output type	FPG-PP12
2-axis type	Line driver output type	FPG-PP22

Positioning control using a stepping motor



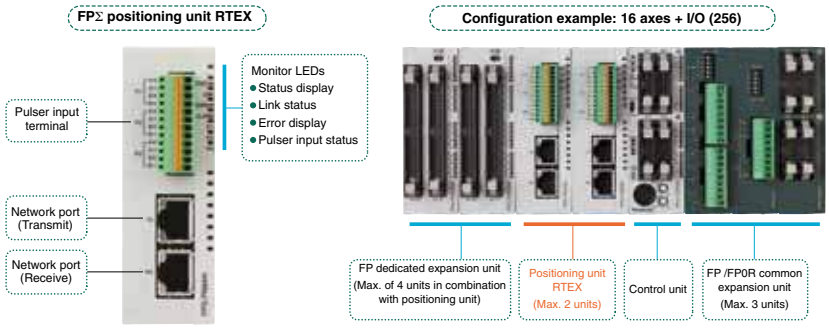
Positioning control using a servo motor



1-axis and 2-axis types are available.
Multiple axes (up to 2 axes) can be controlled with a single unit.

RTEX multi-axis network servo system

The RTEX positioning units support Minas A4N and Minas A5N network servo drives. A mutually optimized system consisting of PLC and servo drive greatly simplifies installation.



System configuration:

- Maximum number of control axes: 16. Realization of highly accurate 2-axis circular interpolation, 3-axis linear interpolation and 3-axis spiral interpolation with high-speed 100Mbps communication.
- With 3 types in the product range, for 2 axes, 4 axes and 8 axes provide flexible support even for control of small numbers of axes.
- Loop wiring RTEX* provides high reliability by creating smooth communication conditions in which data always flows in the same direction.

*Panasonic Realtime Express

Specifications:

			2-axis type	4-axis type	8-axis type
	Part number FPΣ (Sigma)		**FPG-PN2AN**	**FPG-PN4AN**	**FPG-PN8AN**
Unit specifications	Positioning control functions	Control method	PTP Control, Cursor Path (CP) Control		
		Interpolation control	2-axis/3-axis linear interpolation, 2-axis circular interpolation, 3-axis spiral interpolation		
		Control units	Pulse/μm/inch/degree		
		Position data	600 points for each axis		
		Backup	Parameters and data file can be saved to FROM		
		Acceleration/deceleration method	Linear acceleration/deceleration/S-curve acceleration/deceleration		
		Acceleration/deceleration time	0 to 10,000ms (1ms units) different settings for acceleration and deceleration are possible		
		Positioning area	(-1,073,741,823 to 1,073,741,823 pulse) increment and absolute specification		
	Speed control functions		Supported with JOG operation (free run operation)		
	Origin functions	Search method	Origin proximity (DOG) search		
		Creep speed	Free settings possible		
	Other functions		Pulser input operation support		
			Auxiliary output code, auxiliary output contact support		
			Dwell time support		
Communication specifications	Communication speed		100Mbps		
	Cable		Commercially available LAN straight cable (shielded category 5e)		
	Connection method		Ring method		
	Communication cycle/no. of terminals		0.5ms; max. 8 axes/system (command cycle: 1ms)		
	Transmission distance		Between terminals: 60m; total length: 200m		

FP-X series: An advanced compact model

Features

- Abundant program capacity – 32k steps
  The 32k-step program capacity can accommodate an increase in the number of programs accompanying functionality enhancements, expansions, or changes of equipment.
- Equipped with an independent comment memory
  The FP-X series offers sufficient comment memory to enable saving the PLC program created according to IEC 61131, including all comments.
- Equipped with a high-speed RISC processor
  Equipped with a RISC processor, achieving high-speed processing with a scan time of less than 2ms for 5000 steps.
- Add-on cassettes can expand the functionality, maintaining the space-saving size
  Up to three add-on cassettes can be attached to the control unit. Functionality can be enhanced without increasing the required footprint. The 16 types of add-on cassettes, including the communication and analog types, cover a wide variety of applications.
- Multi-axis control by the built-in pulse output
  The transistor output type controller has a built-in pulse output that allows multi-axis control of the servo and stepping motors.
  C14: 3 axes, C30/C60: 9 axes.

High security: program protection with an 8-digit password and a function prohibiting uploads

USB-port (C30/C60): easy direct connection with a PC via a commercial USB cable (AB type)

PLC type	AFPX-C14	AFPX-C30	AFPX-C38AT	AFPX-C60
Number of inputs	8	16	24 digital/4 analog	32
Number of outputs	6 relays or transistors	14 relays or transistors	14 digital /2 analog	28 relays or transistors
Max. number of digital I/Os	328	352	360	382
Max. number of analog I/Os	26	28		
Processing speed	0.32μs/step (basic instruction)			
Memory				
Memory type	Built-in Flash ROM			
Program capacity	16k steps	32k steps		
Data register	12,285 words	32,765 words		
Special functions				
High-speed counter	Input of main unit: Transistor output types: Single-phase 8ch (50kHz x 4ch + 10kHz x 4ch), Two-phase 4ch (35kHz x 1ch, 25kHz x 1ch, 5kHz x 2ch) Relay output types: Single-phase 8ch (10kHz x 8ch), Two-phase 4ch (5kHz x 4ch) Input of pulse I/O cassette AFPX-PLS (for relay output types): Single-phase: 2 channels 80kHz or 4 channels 50kHz Two-phase: 1 channel: 30kHz or 2 channels: 25kHz			
Pulse output	Built-in transistor outputs: 100kHz x 2ch + 20kHz x 2ch Pulse I/O cassette AFPX-PLS (for relay output types only): One unit (one axis) 100kHz, or two units (two axes) 80kHz			
Serial interfaces	Up to 3 serial interfaces, C30/C60 also USB port			
Clock/calendar function	Available when AFPX-MRTC installed			
Other functions	Password (4 digits, 8 digits), upload protection, comment storage (328kByte)			
Operating voltage range	85 to 264VAC (AC power), 20.4 to 28.8VDC (DC power)			

High adaptability

Add the cassettes you need to meet your individual needs

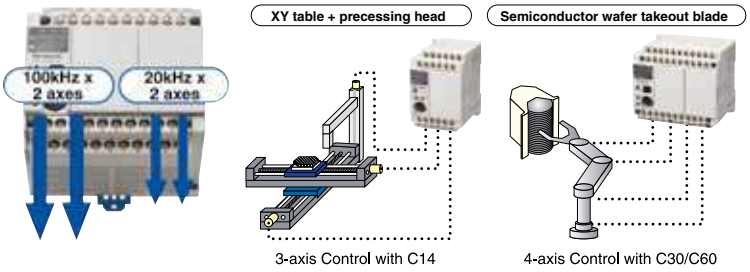
The add-on cassettes can easily be mounted onto the control unit, up to 2 cassettes on the C14 or 3 cassettes on the C30/C60. By using one communication cassette, which can be stacked on top of another expansion cassette, even the FP-X's communication can be expanded.

Easily removable
(two screws secure the unit)

Built-in 4-axis pulse output: 2-axis linear interpolation simultaneously in two sets

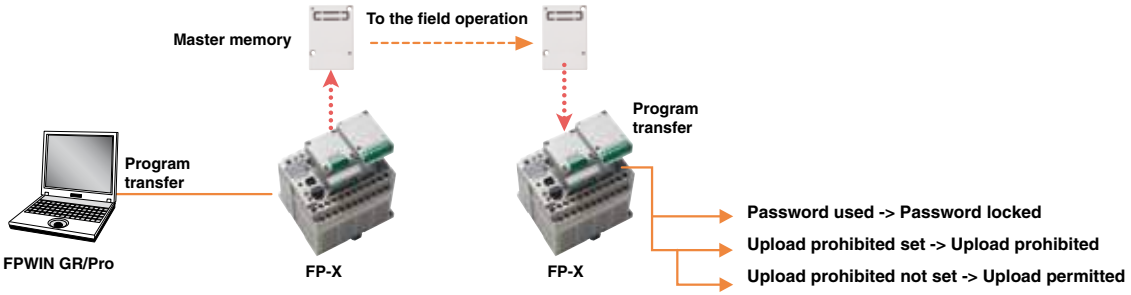
The transistor output type C14 comes with 3-axis while C30/60 comes with 4-axis pulse output inside the control unit. The multi-axis control, which previously required a higher-level PLC or additional positioning unit, or two or more PLC units, can now be achieved with only one FP-X transistor output type unit in a small space at a low cost.

FP-X transistor output type is capable of simultaneously controlling 2-axis linear interpolation, for the first time in the industry with a compact pulse-output PLC.



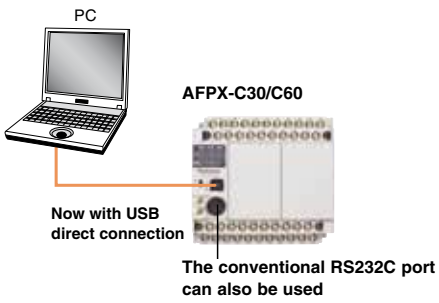
Easy program transfer with master memory cassette, real-time clock included

- The built-in 1MB Flash-ROM can store a 32k-step program as well as the comments of FPWIN Pro source file.
- The master memory cassette allows you to conveniently update a program on an FP-X in the field.
- Because the master memory cassette can store password information, you can easily enjoy all the security features the FP-X offers even when transferring programs in the field.
- The built-in real-time clock enables repeated periodical control and data logging.



Expensive USB conversion adapter/cable unnecessary

Now you can connect your PC directly to the FP-X C30's or C60's USB port.



Product lineup

The highly expandable lineup satisfies a wide range of demands

Control unit

	Relay output		Transistor output	
	DC power supply	AC power supply	DC power supply	AC power supply
	AFPX-C14RD	AFPX-C14R	AFPX-C14TD (NPN) AFPX-C14PD (PNP)	AFPX-C14T (NPN) AFPX-C14P (PNP)
Program capacity: 16k steps 2-point potentiometer	8-point input of 24VDC 6-point output of 2A relay	8-point input of 24VDC 6-point output of 2A relay	8-point input of 24VDC 0.5A/5 to 24VDC 6-point output of transistor	8-point input of 24VDC 0.5A/5 to 24VDC 6-point output of transistor
	AFPX-C30RD	AFPX-C30R	AFPX-C30TD (NPN) AFPX-C30PD (PNP)	AFPX-C30T (NPN) AFPX-C30P (PNP)
Program capacity: 32k steps 2-point potentiometer, equipped with a USB communication port	16-point input of 24VDC 14-point output of 2A relay	16-point input of 24VDC 14-point output of 2A relay	16-point input of 24VDC 0.5A/5 to 24VDC 14-point output of transistor	16-point input of 24VDC 0.5A/5 to 24VDC 14-point output of transistor
	AFPX-C60RD	AFPX-C60R	AFPX-C38AT	AFPX-C60T (NPN) AFPX-C60P (PNP)
Program capacity: 32k steps 4-point potentiometer, equipped with a USB communication port	32-point input of 24VDC 28-point output of 2A relay	32-point input of 24VDC 28-point output of 2A relay	32-point input of 24VDC 0.5A/5 to 24VDC 28-point output of transistor	32-point input of 24VDC 0.5A/5 to 24VDC 28-point output of transistor
	AFPX-C60RD	AFPX-C60R	AFPX-C60TD (NPN) AFPX-C60PD (PNP)	AFPX-C60T (NPN) AFPX-C60P (PNP)
Program capacity: 32k steps 4-point potentiometer, equipped with a USB communication port	32-point input of 24VDC 28-point output of 2A relay	32-point input of 24VDC 28-point output of 2A relay	32-point input of 24VDC 0.5A/5 to 24VDC 28-point output of transistor	32-point input of 24VDC 0.5A/5 to 24VDC 28-point output of transistor

Expansion unit

	Relay output		Transistor output
	AFPX-E16R	AFPX-E14YR	AFPX-E16T (NPN) AFPX-E16P (PNP)
Remarks: 2 or more E16s cannot be connected serially because they cannot supply the power to other units.	8-point input of 24VDC 8-point output of 2A relay	14-point output of 2A relay	8-point input of 24VDC 0.5A/5 to 24VDC 8-point output of transistor

	DC power supply	AC power supply	DC power supply	AC power supply
	AFPX-E30RD	AFPX-E30R	AFPX-E30TD (NPN) AFPX-E30PD (PNP)	AFPX-E30T (NPN) AFPX-E30P (PNP)
Remarks: Addition of up to 8 units is possible including E16 and EFP0.	16-point input of 24VDC 14-point output of 2A relay	16-point input of 24VDC 14-point output of 2A relay	16-point input of 24VDC 0.5A/5 to 24VDC 14-point output of transistor	16-point input of 24VDC 0.5A/5 to 24VDC 14-point output of transistor

	Input only AFPX-E16X	DC power supply
	16-point input of 24VDC.	AFPX-E16X (16-point input only)

Add-on cassette

	Application cassette	
	AFPX-IN4T3	Input/output cassette (4-point input of 24VDC, NPN 0.3A/3-point output of 24VDC)
	AFPX-IN8	Input cassette (8-point input of 24VDC)
	AFPX-TR8	Output cassette (NPN 0.3A/8-point output of 24VDC)
	AFPX-TR6P	Output cassette (PNP 0.5A/6-point output of 24VDC)
	AFPX-PLS	Pulse I/O cassette (High-speed counter input: single phase 80kHz 2ch, 2-phase 30kHz 1ch) (Pulse output: 1 axis 100kHz < CW/CCW, pulse + sign >) *Cannot be built into a transistor output type.
	AFPX-AD2	Analog input cassette (2 points, 0 to 10 V/0 to 20mA 12-bit non-insulated)
	AFPX-A21	Analog I/O cassette Input: 2ch (0 to 5V/0 to 10V or 0 to 20mA 12-bit insulated) Output: 1ch (0 to 10V or 0 to 20mA 12-bit insulated)
	AFPX-DA2	Analog output cassette 2ch (0 to 10V or 0 to 20mA 12-bit insulated 2ch)
	AFPX-TC2	Thermocouple input cassette (K/J type, resolution: 0.2°C, insulated 2ch)
	AFPX-RTD2	RTD input with 2 channels (insulated)
	AFPX-MRTC	Master memory cassette with a real-time clock* (32k-steps program memory + real-time clock in year/month/day/hour/minute) *Real-time clock requires an optional battery. (Real-time clock → Calendar timer)

	Communication cassette	
	AFPX-COM1	Communication cassette (RS232C 1ch)
	AFPX-COM2	Communication cassette (RS232C 2ch)
	AFPX-COM3	Communication cassette (RS485/422 selectable 1ch insulated)
	AFPX-COM4	Communication cassette (RS485 1ch insulated + RS232C 1ch)
	AFPX-COM5	Communication cassette (Ethernet 1ch + RS232C 1ch)
	AFPX-COM6	Communication cassette (RS485 2ch insulated)

Expansion FP0 adapter

	Part number	Description
	AFPX-EFP0	Up to 3 FP0/FP0R expansion units can be connected.

Add-on cassette for Ethernet

This easy-to-mount communication cassette for Ethernet is suitable for flexible solutions when it comes to collecting inspection and production data and ensuring traceability as well as providing remote access to PLCs, e.g. to update the PLC program.

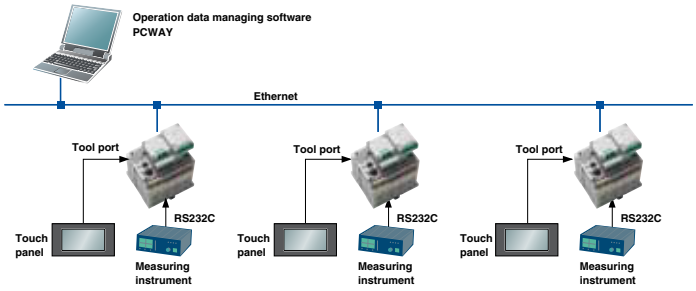
AFPX-COM5

Enables easy Ethernet connections with a compact PLC, which were previously not possible.
Also equipped with an RS232C port. Together with the tool port (programming port), a total of 3 communication ports are available, which is remarkable for a compact PLC.
For example, the following operations are simultaneously available with this cassette attached:

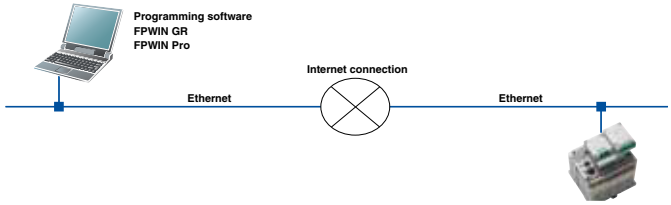
1. I/O control
2. Reading data from a tester (measuring instrument) of inspection equipment (RS232C)
3. Collecting read data from host computer (Ethernet)
4. Setting/monitoring via a touch panel (Tool port)

Application

- Data collection



- Remote maintenance
  Program / monitoring



Interface	Specifications and functions
Ethernet (COM1)	10BASE-T, 100BASE-TX, TCP/IP, baud rate: 9600bit/s/115,200bit/s • MEWTOCOL-COM master/slave (3 connections max.) • Program-controlled communication (1 connection max.) Server function, client function
RS232C (COM2)	• 3-wire (RD, SD, SG), asynchronous, baud rate: 300bps to 115,200bit/s • MEWTOCOL-COM master/slave • Program-controlled communication • Modbus-RTU master/slave

Ethernet port functions		Specifications
MEWTOCOL-COM master/slave		• Automatically sends responses without communication programs to commands of Panasonic's open protocol MEWTOCOL. • Contact/word data writing/reading, program editing • PCWAY, FPWIN GR and FPWIN Pro are supported
Program-controlled communication	Server function	• Waits for a connection from a client PC (personal computer), and after the connection has been established, receives data from the PC
	Client function	• After the power has been turned on, establishes a connection to a preset IP address and sends data

Use our free software "Configurator WD" for setting up the Ethernet port (e.g. IP address and operation mode).

Download the software free of charge from:
www.panasonic-electric-works.com

Positioning with the FP-X

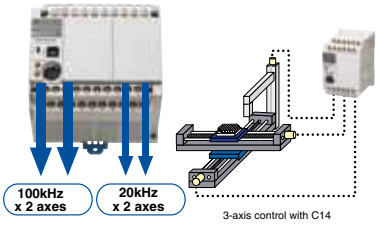
For low cost multi-axis positioning control

Built-in 4-axis pulse output (transistor output type)

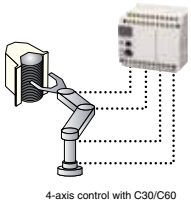
The transistor output type C14 comes with 3-axis while C30/C60 comes with 4-axis pulse output inside the control unit. Multi-axis control, which previously required a higher-level PLC or an additional positioning unit, or 2 or more PLC units, can now be achieved with only 1 FP-X transistor output type unit in a small space at a low cost. In addition, as this type does not require a pulse I/O cassette as needed for a relay output type, other function expansion cassettes such as communication or analog input can be attached for more diversified applications.

Item	Specification
Pulse output Max. frequency	C14: 100kHz(CH0,1), 20kHz(CH2) C30,C60: 100kHz(CH0,1), 20kHz(CH2,3)
Output type	CW/CCW, Pulse + Direction Output
Function	Trapezoidal control, table shaped control, jog operation, home return, 2-axis linear interpolation

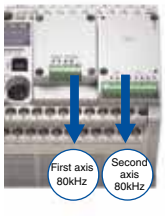
XY table + processing head



Semiconductor wafer takeout blade



The relay output type can control 2 axes by using the expansion cassettes



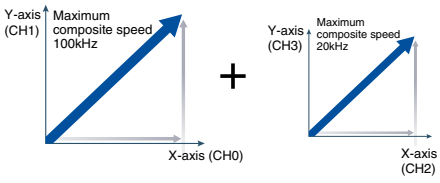
Pulse output up to 2-axis 80kHz is possible by loading 2 pulse I/O cassettes (AFPX-PLS). Also capable of performing 2-axis linear interpolation.

Remark:
Pulse I/O cassette does not work with control unit transistor output type.

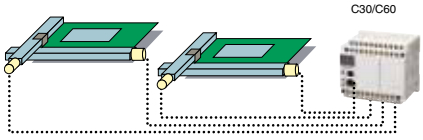
2-axis linear interpolation simultaneously in 2 sets (transistor output type)

2-axis linear interpolation refers to moving a robot arm or equipment head diagonally on a straight line by simultaneously controlling 2 motor shafts. It is used for palletizing, component pick and place, XY table control, contour cutting of a PC board, etc. The FP-X transistor output type is capable of simultaneously controlling 2-axis linear interpolation, for the first time in the industry with a compact pulse-output PLC. This unit dramatically expands the range of applications along with the added convenience of programming by using the linear interpolation command F175_PulseOutput_Linear.

Simultaneous control of 2 mechanisms



Controls 2 units of 2-axis XY table

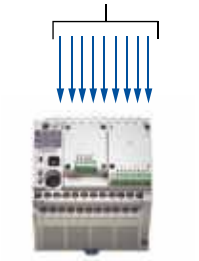


The relay output type is also capable of 2-axis linear interpolation.

By adding 2 pulse I/O cassettes (AFPX-PLS), linear interpolation is possible at the maximum composite speed of 80kHz. The command used for this unit is F175 (SPSH), the same as that for the transistor output types.

High-speed counters 8 built-in sets

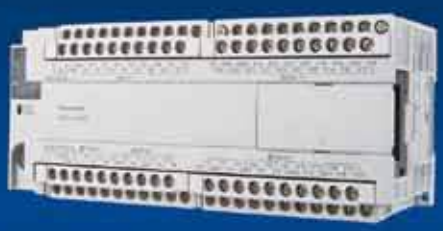
8 single-phase or 4 dual-phase sets (X0~X7)



Model type	Input mode	1 channel in use	All channels in use
Transistor output type	Single phase	100kHz	50kHz x 4ch + 10kHz x 4ch
	Dual Phase	35kHz	20kHz x 2ch + 5kHz x 2ch
Relay output type	Single phase	10kHz	10kHz x 8ch
	Dual phase	5kHz	5kHz x 4ch

When adding a pulse I/O cassette to the relay output type, 2 high-speed counter sets can be added to every cassette. Please refer to the user manual for counter specification.


L N COM X1 X3 X5 X7 X9 XB XD XF
COM X0 X2 X4 X6 X8 XA XC XE
POWER 100-240V ~
24V ⎓
RUN
PROG.
Panasonic
FP-X0 L30R
OUT:0.3A
0V
24V
Tr.NPN
Y1 Y3 Y4 Y6
Y0 Y2 COM0 Y5 Y7
RELAY
Y8 Y9 YA YC
COM1 COM2 YB YD



FP-X0 – The multi-functional, economical PLC

Features

- Built-in 2-axis Pulse Output Function
  L14 is 1-axis pulse output, while L30/L40/L60 are 2-axis, and the pulse output function is built in the body of the controller. Built-in 2-axis type can realize linear interpolation (Only for L40 and L60).

- Analog input function
  Multi-functional analog input (10 bit, 2-channel)
  Voltage input (0 to 10 V), thermistor input and adjustable potentiometer input.

- Line up
  M6 kinds of control units L14R, L30R, L40R and L60R: Ry+Tr, AC L40MR, L60MR: Ry+Tr, RS485, AC

- Performance
  Super-high processing Sspeed
  Super-high speed of 80 ns/step for 0 to 3000 steps (ST command). 580 ns/step processing speed for 3001 steps

PLC type	L14R	L30R	L40R	L40MR	L60R	L60MR
Maximum controllable I/O points	14	30	40	40	60	60
Program capacity	2.5k steps	8k steps				
Operation speed	0.08μs/step (basic instructions)					
Data registers	2500 words	8192 words				
Internal relays	1008 points	4096 points				
Analog input	No	2 channels, for inputting any of the following items in each channel				
		Potentiometer input Min. resistance value of potentiometer: 5kΩ 10-bit resolution (K0 to K1000) Accuracy ± 1.0% F.S.+ accuracy of external resitors				
		Thermistor input For inputting the resistance value of the thermistor (Min. resistance value of external thermistors + external resistance value 2kΩ) 10-bit resolution (K0 to K1023) Accuracy ± 1.0% F.S.+ accuracy of external thermistors 2 kΩ) 10-bit resolution (K0 to K1023) Accuracy ± 1.0% F.S.+				
		Voltage input Absolute max. input voltage: 10V 10-bit resolution (K0 to K1023) Accuracy ± 2.5% F.S.(F.S. = 10V)				
Real-time clock	No	Yes				


PSA1
POWER
FP2-C2P
RUN
PROG.
TEST
BREAK
ERROR
BATT.
ALARM
INITIAL
TEST
RUN
REMOTE
PROG.
Panasonic
FP2SH
COM. (RS232C)
TOOL (RS232C)
XY64D2T
Y64T
PP42
MCU
ET1

FP2SH series: Ultra-high performance

Features

- 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.
- Large programming capacity of up to 120k steps
  32k, 60k and 120k programming capacities are available depending on the model.
- 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.
- Built-in comment and calendar timer functions
  These functions are built right into the FP2SH.
- The I/O unit and intelligent unit are the same as for the FP2SH series.

Power supply/I/O specifications

Item	Description
Power supply	100V to 120VAC / 200V to 240VAC 100V to 240VAC, 24V DC (varies with different models)
Input	12V to 24V DC, 24V DC ±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	Stan-dard	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 instruction)
Built-in memory		RAM (ROM/Small PC card is optional)
Memory capacity		Approx. 32k/60k steps/approx. 120k steps (varies with different models)
Operation memory	Internal relays	14,192 points
	Timer/counters (T/C)	3072 points in total
	Data registers	10,240 words
	File registers	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 CCU, MCU and serial data unit
	RS422 RS485	Expandable by adding MCU
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/ Fieldbus network	MEWNET-W2 (Wire) MEWNET-W0 MEWNET-VE PROFIBUS DeviceNet CANopen PROFINET I/O
MEWTOCOL-COM	Linkable by using tool port or COM. port on CPU unit. Also available by adding MCU and CCU
Modem connection	Available

Other built-in functions

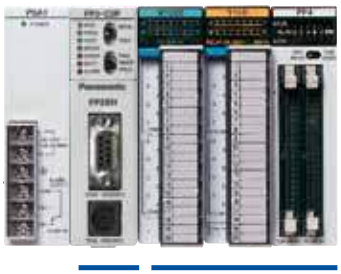
Item	Description
Program block-edit during RUN	Available
Constant scan	Available
Clock/Calendar function	Built-in type

Item	Part numbers
Standard type CPU (60k steps)	FP2-C2
CPU for IC card (32k steps)	FP2C2L
CPU for small PC card (60k steps)	FP2-C2P
CPU for small PC card (120k steps)	FP2-C3P

FP2SH system configurations and unit lineup

Unit combinations

- Most units occupy one slot, 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

100 V AC,
2.5 A type
FP2-PSA1

200 V AC,
2.5 A type
FP2-PSA2

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

24 V DC,
5 A type
FP2-PSD2

Backplanes

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

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 slots each

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)
FP2-EC

Expansion cable
(2m)
FP2-EC2

Dummy unit
FP2-DM

CPU units

FP2SH

Standard type
(32k steps)
FP2-C2L

Standard type
(60k steps)
FP2-C2

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

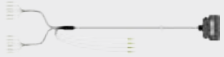
For small PC card
(120k steps)
FP2-C3P

Small PC card

2MB SRAM
(AIC52000)

Panasonic Servo MINAS A5 Series

DVOP0988W



- Except for the 5-module expansion backplane, all 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

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

(2-axis)
Positioning units
RTEX
FP2-PN2AN

(4-axis)
Positioning units
RTEX
FP2-PN4AN

(8-axis)
Positioning units
RTEX
FP2-PN8AN

(2-axis)
Positioning units
FP2-PP21 FP2-PP22
FP2-PP2T FP2-PP2L

(4-axis)
Positioning units
FP2-PP41 FP2-PP42
FP2-PP4T FP2PP4L

Link-related units

High-speed counter unit
FP2-HSCT FP2-HSCP

Pulse I/O unit
FP2-PXYT FP2-PXYP

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

Serial data unit
FP2-SDU

Computer communication unit
FP2-CCU

ET-LAN
FP2-ET2

Multi-wire link unit
FP2-MW

Fieldbus Master units
FP2-DPV1/DEV/CAN-M

Fieldbus Slave units
FP2-DVP1/DEV/CAN/PRT-S

S-LINK
FP2-SL2

Positioning units (interpolation type)

Features

- A pulse output of 4Mpps allows high-speed, high-precision positioning.
- 0.005ms high-speed drive reduces tact-time (start-up time is the time from reception of the CPU unit start-up command to release of the pulse output by the positioning unit).
- 4 axes per unit means versatility and saves space.
- The four types of S-curve acceleration/deceleration control allow for smooth startup and stoppage.
- Feedback pulse count function makes output pulse counting possible for encoders, etc.
- The pulse input function allows users to generate pulses manually to adjust machines, for example.

Functions

- E-point control
- P-point control
- Home return
- Jog operation
- Pulser input
- Interpolation
- Single speed acceleration/deceleration
- Multistage acceleration/deceleration
- Fast startup of 0.02 or 0.005ms makes cycle time reduction possible
- Smooth acceleration/deceleration: Linear or in the shape of 4 curves: sine, quadratic, cycloid, and cubic curve (for smooth startup and stopping)

Positioning units (without interpolation type)

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 servo motors. 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. (Start-up time: Time between reception of a command from a CPU unit and pulse output from a positioning unit.)

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

- 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 Control 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 servo series.

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

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

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

High-speed counter units and pulse I/O units

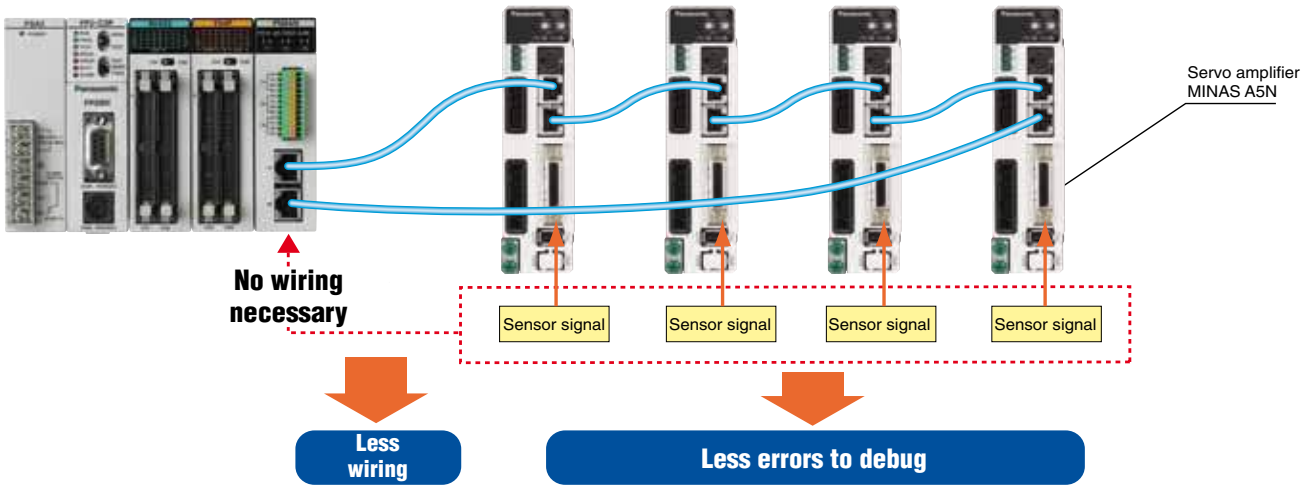
Interrupt, counting, pulse output, and PWM output functions are integrated in a single unit

- 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.

Real-time Ethernet servo system for Minas A5N servo drives

The RTEX positioning units for FP2SH support the MINAS A5N network servo drives. A mutually optimised system consisting of PLC and servo drive greatly simplifies installation.



The main advantages of the RTEX positioning units:

- Unique: Allows easy control of network servos with an ultra-compact PLC.
- Allows highly accurate control of multi-axis positioning using high-speed 100Mbit/s communication.
- Commercial LAN cables greatly reduce wiring costs. Position control of 2, 4, or 8 axes for servo drives with Ethernet (RTEX) interface.
- Dedicated tool software "Configurator PM" supports operations from setup through startup and monitoring.
- Includes manual pulse input allowing support for precision teaching.

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 2, 4, and 8-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.

No. of positioning units per RTEX unit

FP2SH: 32 units

Control of 2 to 8 axes in one positioning unit

Products

Product name	Number of axes	Output type	Part number
FP2 positioning units (Interpolation type)	2	Transistor	FP2-PP2T
		Line driver	FP2-PP2L
		RTEX Ethernet	FP2PN2AN
	4	Transistor	FP2-PP4T
		Line driver	FP2-PP4L
		RTEX Ethernet	FP2PN4AN
	8	RTEX Ethernet	FP2PN8AN
Control Configurator PM	for all RTEX units	RTEX Ethernet	AFPS66510

24VDC power supply units for FP-e, FP0R, FPΣ (Sigma), FP-X

Features

- High power density with minimal losses
- Up to 91.5% efficiency (FP-PS24-060E)
- Wide ambient temperature range from -10°C to +70°C, without performance loss
- Safety approvals (IEC60950, UL60950,CSA22.2-60950, EN60950)
- Protection class II, without grounding
- Easy mounting and wiring
- Extremely compact with optimal air cooling

FP-PS24-0120E (24VDC/5A) | FP-PS24-024E (24VDC/1A) | FP-PS24-060E (24VDC/2.5A)

Specifications

Item		FP-PS24-024E	FP-PS24-060E	FP-PS24-0120E
Ambient temperature		-10°C to +70°C, without needing cooling fans		
Storage temperature		-25 to +85°C		
Humidity		Max. 95%, no condensation		
Vibration		IEC 60068-2-27, 20g - 6ms, 10g – 11ms; 4 shocks/axis, 18 shocks total		
Shock		IEC 60068-2-6, 2-17.8Hz: ±1.6mm; 17.8 - 500Hz: 2g 2 hours/axis		
Primary side	Rated input voltage	100 – 240V AC/DC, 50 – 60Hz		
	Power supply voltage	85–264V AC, 47–63Hz (DC 100–375V), wide range power supply, switching ranges unnecessary		
	Input current	Fulfills the requirements of EN61000-3-2 (limits for harmonic current emissions)		
	Fuse	Internal in power supply T4AH/250V, not accessible		
Secondary side	Output voltage	24V DC nominal		
	Accuracy, output voltage	±1% over the complete load and input voltage range		
	Adjustable range with potentiometer	23V – 29V		
	Output capacity (max.)	1A continuous at 24V 1.25A (25% above nominal load) Dynamic for 7s, max. 1.5A (50 % above nominal load) dynamic for 2.5s, max.	2.5A continuous at 24V 3.15A (25% above nominal load) Dynamic for 7s, max. 3.75A (50 % above nominal load) dynamic for 2.5s, max.	5.0A continuous at 24V 6.25A (25 % above nominal load) dynamic for 7s, max.sec. 7.5A (50 % above nominal load) dynamic for 3s, max.x. 3 sec
	Output capacity (min.)	0A		
	Current limiting (typ.)	2A continuous, 2A dynamic	2.7A continuous, 5A dynamic	5.3A continuous, 9.5A dynamic
	Ripple voltage (< 20MHz)	= 40mVSS measured at 20MHz, 50 Ohms terminated		
Efficiency	VAC = 230V	88.0%	91.5%	90.0%
	VAC = 115V	87.0%	90.0%	89.0%
	VAC = 100V	86.0%	88.0%	89.0%
Lifetime of the capacitors		All capacitors used are special 105°C long-life-types with a minimum lifetime of 50,000 hours @ Tu = 50°C (power supply-air flow temperature)		
Safety and function tests		100% testing		
Startup duration		Depends on the load, typically 5 –10ms		
Safety	Output	Safety extra low voltage (SELV) EN 60950		
	Class of protection	Class II (with additional constructive measures)		
	Degree of protection	IP20		
	Leakage current	< 0,25mA (47-63Hz and max. 264V AC)		
Dimensions (D x W x H)		105.5 x 30 x 75 mm	104.5 x 44.8 x 75 mm	105.5 x 70 x 85 mm
Weight		Approx. 170g	Approx. 250g	Approx. 500g

Safe, easy and cost-effective M2M communication

Wordwide communication

The FP Web-Server unit connects all FP series controllers to the 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. Configuration of the unit is easily done with the FP Web Configurator Tool, which has to be ordered once separately.

FP Web-Server main features:

Web-Server:
- PLC data presented as HTML pages
- Access via standard Internet browser
- HTML entry field for PLC data change
- Optional password protection
- Java applet functions library

Data logger:
- Logging of PLC data and saving it on an SD memory card or transmitting it via FTP (only possible when FP-WEBEXP is attached)

Email:
- PLC can send e-mails, also with PLC data attachments
- E-mail server access via LAN or Internet dial-up
- PLC defined or pre-stored mail text

RS232C device server:
- Ethernet ↔ RS232C conversion (MEWTOCOL)
- Transparent RS232C data tunnelling via Ethernet
- Programming and visualization access via Ethernet

Modem / Ethernet gateway:
- FP Web-Server can be dialed up via modem for local or network access
- One remote gateway for multiple FP Web-Servers in a local Ethernet network
- Remote password handling

Modbus-TCP communication:
- Modbus-TCP server or client for a PLC
- Modbus-TCP server for multiple PLCs
- Modbus-TCP server gateway for Modbus-RTU slave unit(s)
- Modbus-TCP client gateway for any Modbus-RTU master
- Modbus-TCP master or slave interface for a PLC

Other functions:
- XML file delivery for PLC data exchange
- Network time server functions

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
- Interface / protocol converter

IEC60870 Communicator

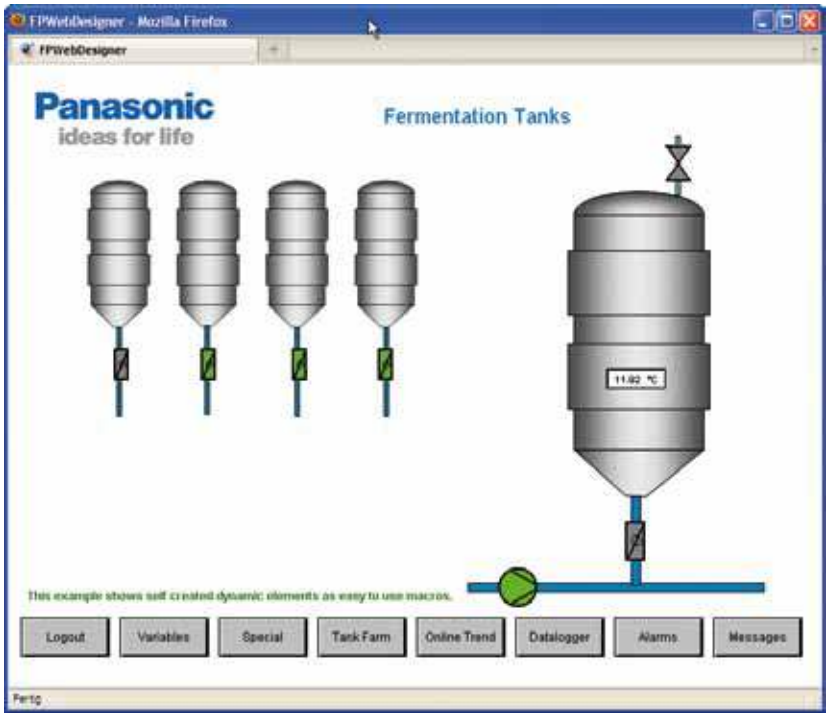
With the IEC60870 Communicator add-on license remote process stations can easily be linked to supervisory control systems or telecontrol main stations. Both modem connection (IEC 60870-5-101) and Ethernet or TCP/IP (IEC 60870-5-104) are supported in one module.

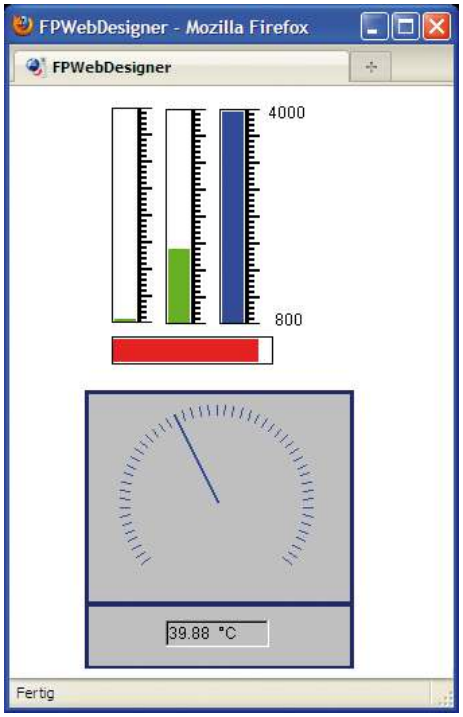
The IEC 60870-5 is an international standard for telecontrol protocols. It provides high transmission reliability and allows to link devices of various manufacturers. Highly precise timestamps compliant to IEC standard can also be transmitted.

Item	FP Web-Server		FP Web Expansion
Current consumption	65mA		Additional 20mA on FP Web-Server
Operating voltage	24V DC (10.8 – 26V DC)		Internally powered by FP-WEB2
Communication port	RS232C to connect to the PLC, RS232C to connect to a modem, 100Base-TX/10Base-T Ethernet		USB host port (supports GT series and FP-X PLCs), RS485
Storage space	Built-in Flash ROM		SD/SDHC card slot
Data logging	Via FP Web Expansion		Logging on SD/SDHC Card
Digital output	Via FP Web Expansion		High speed photo coupler
Communication protocols	MEWTOCOL, DNS, HTTP, HTTPS, SMTP, FTP, TELNET, TCP/IP, UDP/IP, PPP, SNTP, Modbus RTU, Modbus-TCP, SNMPv1, IEC 60870-5-101, IEC 60870-5-104		
Security	Password protection, IP lock		
Ambient temperature	0°C to +55°C		
Storage temperature	-20°C to +70°C		
Dimensions (W x H x D)	25 x 90 x 60 (mm)		
Weight	0.11kg		0.07kg
Part number	FPWEB2		FPWEBEXP
Software	FP Web Configurator	IEC60870LIS license for FPWEB2	FP Web Designer
Part number	FPWEBTOOL2D	IEC60870LIS	AFPS36510-E

Website editor for FPWEB2

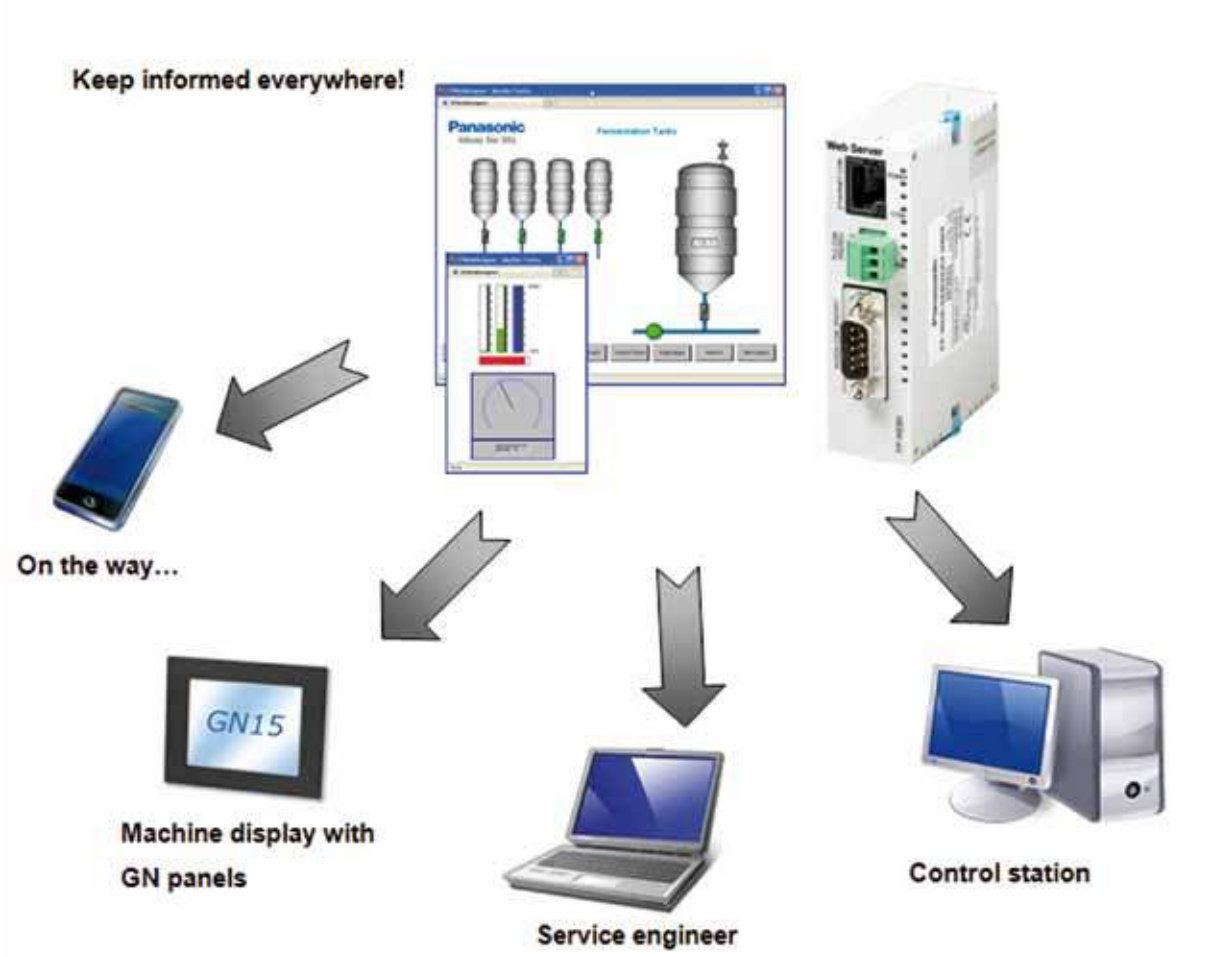
FP Web Designer is an easy-to-use editing tool for creating Websites for visualizing all process graphics and displaying process data collected by FP Web-Server. No programming knowledge for HTML, PHP, JavaScript or Java is required! Extensive graphic libraries help users with their design work.





Features of FP Web Designer

- WYSIWYG (What you see is what you get) editor for graphic design of applications
- The designed pages can be called up by a web browser on any PC connected to LAN or WAN
- All process values are shown automatically an the screen. Each diagram can display up to 5 trend curves for measured values stored in PLCs. A simple mouse click updates the page
- The measured values together with trend curves can be stored as CSV files
- Alarm information can be visualized in web browser and saved. Updating alarm information runs in the background so that the web pages always display the current status in the browser.
- The Web pages in the browser can be password-protected to prevent unauthorized access and changes
- Process values can be imported in CSV format from PLC programs written with Control FPWIN Pro
- Extensive and expandable macro libraries available
- Online help in English and German



With the help of integrated macro functions in FP Web Designer, alarm reports and diagrams of measured values can be easily embedded into the designed graphic application.

Part number	Description	Comments
AFPS36510-E	FP Web Designer, economy edition	Limited to 250 process points, 15 views, 1 offline trend + 1 alarm
AFPS36510-B	FP Web Designer, basic edition	FP Web Designer, limited to 500 process points, 30 views, 3 offline trends + 1 alarm
AFPS36510-X	FP Web Designer, extended edition	No limitation
AFPS36510-E2B	FP Web Designer, upgrade from economy to basic edition	–
AFPS36510-B2X	FP Web Designer, upgrade from basic to extended edition	–
AFPS36510-E2X	FP Web Designer, upgrade from economy to extended edition	–
AFPS36510-E2E-UPG	FP Web Designer, upgrade from economy to economy version 6.10	-
AFPS36510-B2B-UPG	FP Web Designer, upgrade from basic to basic edition version 6.10	-
AFPS36510-X2X-UPG	FP Web Designer, upgrade from extended to extended version 6.10	-

The expansion Fieldbus Master Units (FMU) for FPk (Sigma) and FP2 PLCs are available for three bus systems: PROFIBUS, DeviceNet and CANopen. Others are planned for the future.

Advantages of the hardware:

- Up to 2 FMUs can be connected to FPΣ (Sigma) CPU. The number of FP2 FMUs is restricted by the size of the FP backplane and the power supply capacity
- One PLC hardware platform for several bus systems
- Gateway function between fieldbus types simply by connecting the corresponding expansion units to the same CPU

For each network type, free ready-made function libraries are available for the programming software Control FPWIN Pro.

They also include a comprehensive online help and programming examples.

FPΣ FMU PROFIBUS:
FPG-DPV1-M

FP2 FMU PROFIBUS:
FP2-DPV1-M

FPΣ FMU DeviceNet:
FPG-DEV-M

FP2 FMU DeviceNet:
FP2-DEV-M

FPk FMU CANopen:
FPG-CAN-M

FP2 FMU CANopen:
FP2-CAN-M

Control Configurator FM is an add-on software for Control FPWIN Pro and is used to configure and diagnose the FMUs.

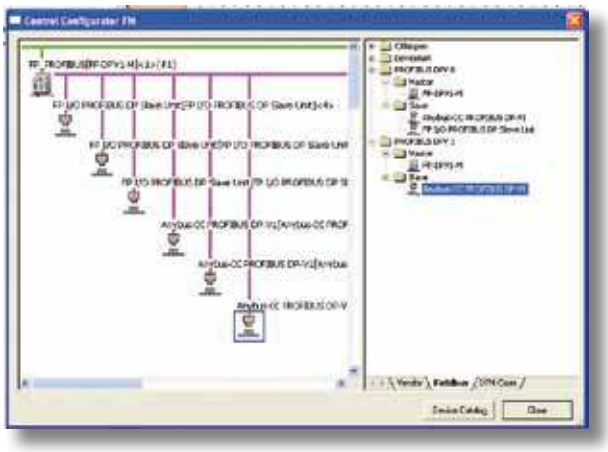
Advantages of the software:

One configuration software for various fieldbus systems

- One-time cost, several network types
- Only one installation necessary

Integrated in the PLC programming software Control FPWIN Pro

- No additional software required on the PC
- Bus-relevant global variables are automatically generated for the PLC program, preventing errors
- Fully integrated in the FPWIN Pro project file, no separate files on PC



Part number: **AFPS35510**

FMU (Fieldbus Master Unit) features

Technical data	PROFIBUS	DeviceNet	CANopen
Bus type	RS485	CAN / ISO 11898	
Number of slaves	125	63	126
Number of process data	3584 bytes for inputs and 3584 bytes for outputs		
Bus length	100m (12Mbit/s), 200m (1.5Mbit/s), 400m (500kbit/s), 1km (187.5kbit/s)	100m (500kbit/s), 250m (250kbit/s). 500m (100kbit/s)	40m (1Mbit/s), 500m (100kbit/s)
Connection types	DP-V0: process data is accessed from the PROFIBUS network as cyclical 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 (Change of State) • Timer-driven connections
Internal current consumption	FPG-DPV1-M: 135mA, FP2-DPV1-M: 450mA	FPG-DEV-M: 45mA, FP2-DEV-M: 150mA	FPG-CAN-M: 135mA, FP2-CAN-M: 450mA
Connector type	DB9F (9-pin Sub-D female)	5-pin terminal block	DB9F (9-pin Sub-D male)
Weight	FPG-DPV1-M: 95g, FP2-DPV1-M: 118g	FPG-DEV-M: 95g, FP2-DEV-M: 118g	FPG-CAN-M: 95g, FP2-CAN-M: 118g

Powerful, compact, modular, high performance fieldbus slave units (FSU) are used together with the programmable controllers FP (Sigma), FP2/FP2SH and FP0/FP0R.

Slave units for PROFIBUS DP
FP2-DPV1-S
FPG-DPV1-S

Slave unit for PROFIBUS DP (FP0/FP0R expansion unit also compatible with FP-X)
FP0-DPS2

Slave units for DeviceNet
FP2-DEV-S
FPG-DEV-S

Slave units for CANopen
FP2-CAN-S
FPG-CAN-S

Slave units for PROFINET IO
FP2-PRT-S
FPG-PRT-S

3 simple steps to set up the network

1. Select network

2. Download free slave data

PROFIBUS DP	GSD file
DeviceNet	EDS file
CANopen	EDS file
PROFINET IO	GSDML file

3. Download free, ready-made library PEW_FNS.sul

All the slave data files and ready-made function libraries can be downloaded free of charge from www.panasonic-electric-works.com.

The function libraries are used for the programming software Control FPWIN Pro. They also include a complete online help file and programming examples.

FSU (Fieldbus Slave Units) specifications:

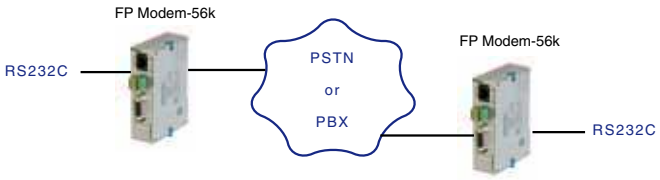
Item	PROFIBUS DP	DeviceNet	CANopen	PROFINET IO
Part no.	FP2-DPV1-S, FPG-DPV1-S FP0-DPS2	FP2-DEV-S, FPG-DEV-S	FP2-CAN-S, FPG-CAN-S	FP2-PRT-S, FPG-PRT-S
Baud rate	• Automatic baud rate detection • 9.6kbaud to 12Mbaud	• Automatic baud rate detection • 125kbit/s to 500kbit/s	• Automatic baud rate detection • 10kbit/s to 1Mbit/s	• 100Mbit/s, full duplex (fixed)
Isolation	Galvanically isolated bus electronics	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 cyclical 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 (Change of state) • Timer-driven connections	PROFINET IO conformance class B Cyclic Data Exchange via PROFINET IO Real Time (RT) communication, 2ms cycle time
Maximum inputs / outputs	• 76 words altogether for inputs and outputs (in units of 1, 2 or 4 words) • FP0-DPS2: 6 words / 6 words	E. g. for cyclic connections: 128 words in each direction	Data 128 words (for TPDOs and RPDOs)	128 words of real time IO data, in each direction
Additional features	Diagnostic support	• UCMM capable • CIP parameter object • Diagnostic support	Diagnostic support	Diagnostic support
Interface	DB9F (9-pin Sub-D female)	5-pin terminal block	DB9F (9-pin Sub-D male)	Integrated 2-port switch: 2 x RJ45 socket
Weight	FP2-DPV1-S: 119g FPG-DPV1-S: 92g FP0-DPS2: 80g	FP2-DEV-S: 120g FPG-DEV-S: 93g	FP2-CAN-S: 120g FPG-CAN-S: 93g	FP2-PRT-S: 119g FPG-PRT-S: 92g
Volume WxHxD	FP2-DPV1-S: 27.7x100x93mm FPG-DPV1-S: 30x90x60mm FP0-DP25: 25x90x60mm	FP2-DEV-S: 27.7x100x93mm FPG-DEV-S: 30x90x60mm	FP2-CAN-S: 27.7x100x93mm FPG-CAN-S: 30x90x60mm	FP2-PRT-S: 27.7x100x93mm FPG-PRT-S: 30x90x60mm

Special features of the FP Modem-56k unit for industrial telecontrol:

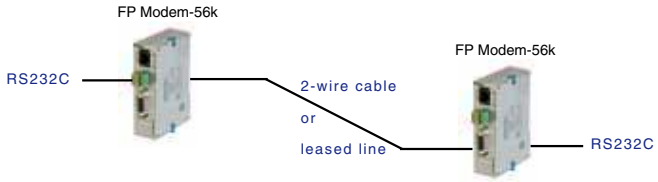
- Very small size
- Operating voltage 24VDC
- Attachable to a 35mm DIN rail
- Maximum line speed up to 56kbit/s
- Leased line mode (peer-to-peer) up to 20km with 33.6kbit/s
- Multidrop leased line mode according to V.23 at 1200bit/s
- DCD output for connection to the digital input of a PLC
- PSTN text message send + receive (if supported by the PSTN)
- CLIP decoder for calling line identification and callback
- Serial communication interfaces RS232C and RS485 are built-in

Combining the FP Modem-56k with the FP Web-Server expands the horizon of telecontrol even more, e.g. internet access, send e-mails, dial up a FP Web-Server for local or network access, etc. User libraries, e.g. Panasonic CONTROL LIBRARY “MODEM” (NCL-CM-LIB), make the integration of communication functions into PLC programs easy.

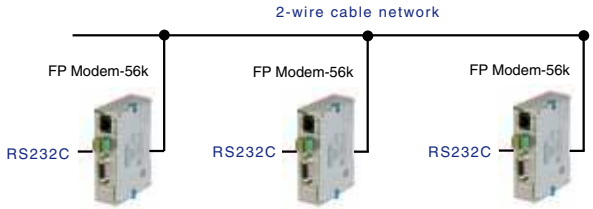
Typical applications for FP Modem-56k:



1. Dial-up mode



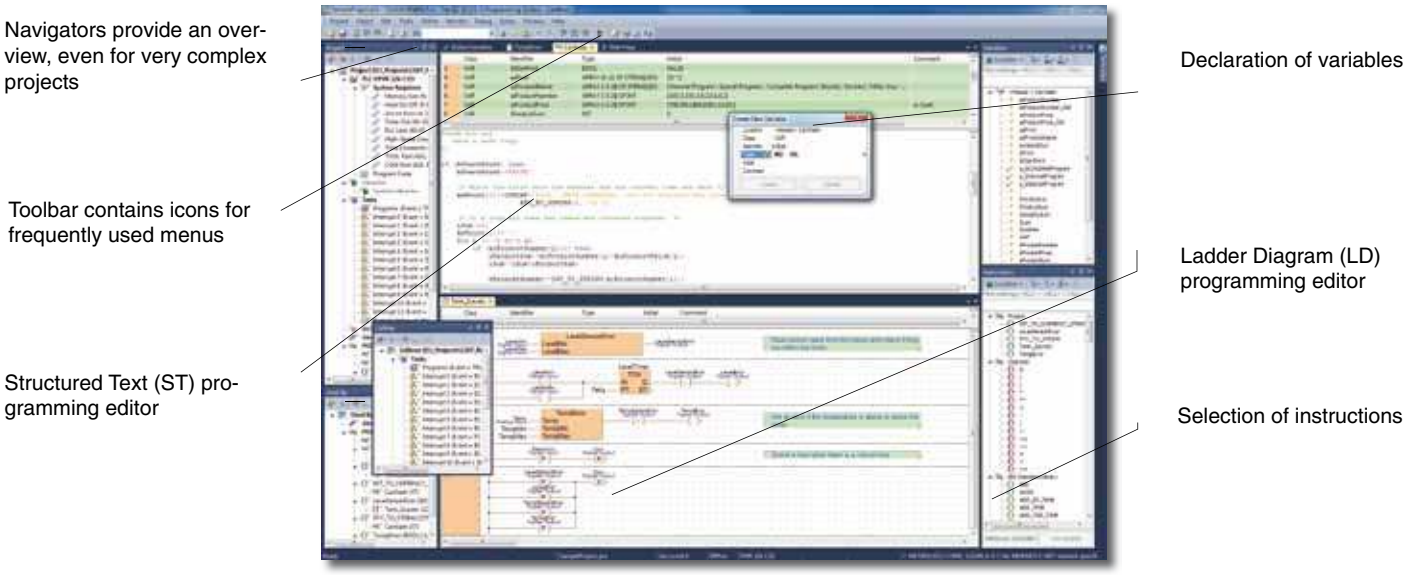
2. Leased-line mode



3. Multipoint mode

Specifications	
Part number	FP-MODEM-56k
Operating voltage	24VDC (10.8 to 26.6VDC)
Current consumption	Approx. 50mA
LEDs	Power, DCD (Carrier detect), RI (Ring), RTS (request to send), RxD, TxD (Data)
Ambient temperature	0 to +55°C
Connection to PLC, PC or FP Web-Server	RS232C (Sub-D 9-pin female), RS485 (Phoenix screw terminal)
Connection to the telephone network	RJ12 jack and RJ12 - RJ12 cable, national adapter is not enclosed
Carrier detect connection	Phoenix screw terminal
Error correction	V.42, LAPM, MNP
Data compression	V.42bis, V.44
Dialing method	Pulse dialing, tone dialing (DTMF)
Control / Operation	Extended AT command set, Hayes compatible (V.250)
Operation modes	Automatic selection, V.21, V.22, V.23, V.22bis, V.32, V.32bis, V.34, V.90, V.92
DTE speed (RS232C baud rate)	300, 600, 1200, 2400, 4800, 9600, 19200, 38,400, 57,600, 115,200bit/s
Line transmission speed	Up to 56kbit/s with V.90
Compliance with standards	CE marking (ES-203021 approval), US approval (US: C04MM05B077FP)
Dimensions (WxHxD)	25 x 90 x 64mm

Control FPWIN Pro is the Panasonic programming software developed according to the international standard IEC 61131-3 (for Windows® 2000/XP/Vista/7).



Control FPWIN Pro highlights

- One software for all FP series PLCs
- 5 programming languages: IL (Instruction List), LD (Ladder Diagram), FBD (Function Block Diagram), SFC (Sequential Function Chart), ST (Structured Text)
- 6 languages are fully supported: English, German, French, Italian, Spanish and Japanese
- Well-structured through program organization units, task and project management
- Remote programming, service and diagnostics via modem or Ethernet
- Extensive comments and online documentation created hand in hand with the program
- Minimum program size through optimized compiler
- Powerful debugging and monitoring tools provide information on the current status of the PLC
- Comprehensive printed documentation and support for function blocks and libraries help to get your hardware running in record time while maintaining rigorous quality standards
- Reuse of functions and function blocks saves time

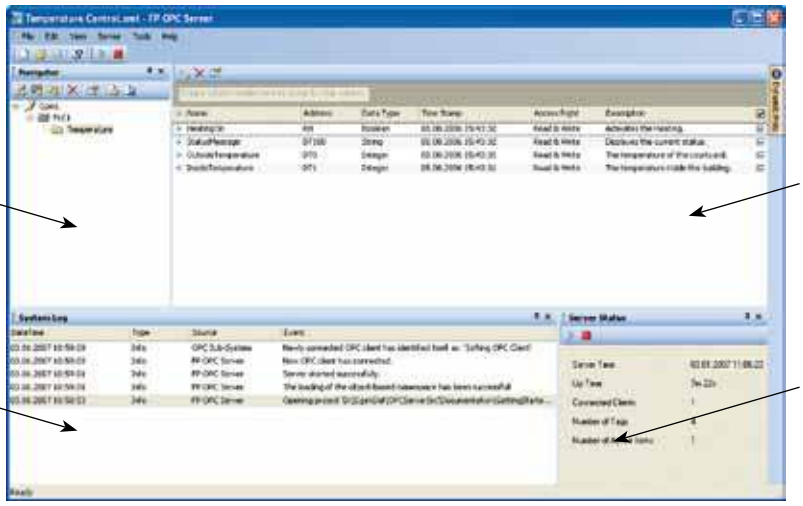
Product	Part number
Control FPWIN Pro 6 full version (supports all FP series PLCs)	FPWINPRO6-FULL
Control FPWIN Pro 6 small version (supports FP-e, FP0, FP0R, FPΣ (Sigma), FP-X)	FPWINPRO6-SMALL
Control FPWIN Pro 6 Version-up full (upgrades the full version from Ver. 3 or higher to Ver. 6)	FPWINPROF6-UPGRADE
Control FPWIN Pro 6 Version-up small (upgrades the small version from Ver. 3 or higher to Ver. 6)	FPWINPROS6-UPGRADE

Ready-made Libraries	Part number:
Ethernet Library	NCL-ET1-LIB
Process and Temperature Control Library	NCL-PTC-LIB
Inverter Serial Communication Library	NCL-ISC-LIB
GSM Communication Library	NCL-CG-LIB
Modem Communication Library	NCL-CMEU-LIB
Motion Control Library	NCL-MC-LIB
Modbus Library, master and slave functionality	NCL-MODBUS-LIB
Control configurator MS open version	NCLCCMSLIB
Many other ready-made libraries including Master/Slave of PROFIBUS/ DeviceNet/CANopen function blocks can be downloaded from **www.panasonic-electric-works.com (download area)**	

Standardized connection to SCADA/HMI software

The Panasonic OPC server allows high-performance data transfer between applications supporting the universally accepted OPC DA Standard (v1-v3) and Panasonic FP series PLCs.

Navigator pane shows the hierarchical structure of channel, device and tag group elements.



Tag pane shows the tag elements in a list structure. Multiple rows can be selected and changes applied to all selected elements.

System log pane displays information, warnings and error event messages.

Server staus pane shows actual status information about the server application, e.g. server time, up time, connected clients and number of tags.

Features of the FP OPC server

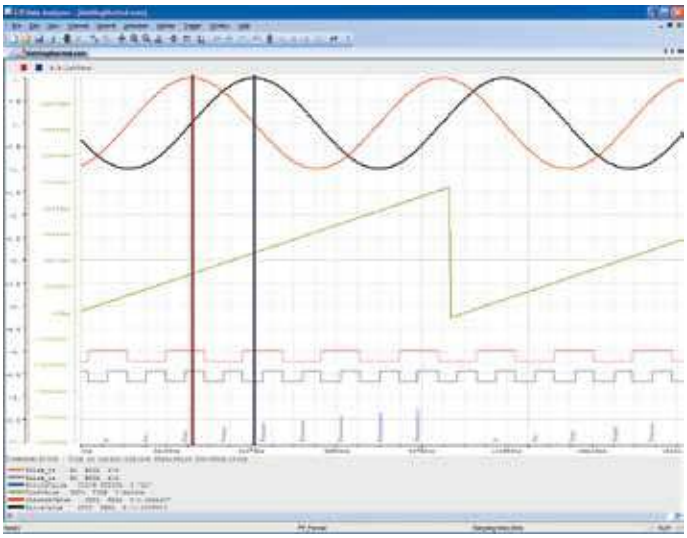
- Modern and intuitive user interface allows you to configure the server. While you are creating the application, sophisticated user assistance and help is omnipresent.
- The server complies to the following OPC DA client/server technologies:
  OPC DA 1.0a
  OPC DA 2.05a
  OPC DA 3.0
- The PLCs can be 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 with other Panasonic software products, e. g. FPWIN Pro, 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: if a connected device stops responding, e. g. because the line is interrupted, the communication is carried on for the other connected devices.

Part number	
FP OPC Server software with one license	AFPS03510D

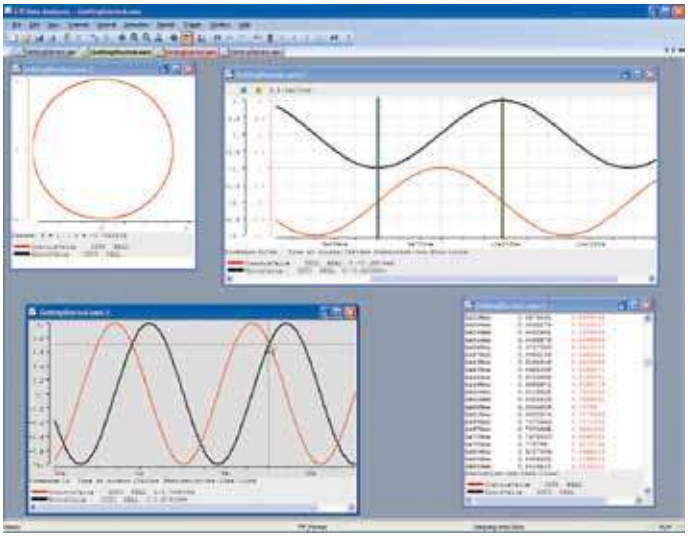
Read and display PLC data

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 any Panasonic PLC by utilizing the integrated MEWNET Manager, for instance via any COM port. Recording and analyzing remote PLCs, sensors, actuators, etc. via LAN or modem is just a matter of seconds.
In addition, not only PLCs can be analyzed with the FP Data Analyzer! Via the integrated OLE interface, the P500 image processing software can also send samples to the analyzer.



Features of the FP Data Analyzer



- LAN and modem connection for remote control via LAN, Internet or telephone line
- Concurrent data acquisition from several independent PLCs
- Acquisition of all internal and external PLC registers, relays, counters, timers, arrays and even DUTs
- Connection to P500 image processing software
- Data types can be recorded and displayed as: BOOL, INT, DINT, WORD, DWORD, REAL, STRING, ARRAY of type
- Adding new channels while recording
- Variable list compatible to Control FPWIN Pro GVL export
- Trigger functions with pre-trigger, post-trigger
- User-defined sampling rate from a few milliseconds to hours or even days
- Each channel can be displayed in any color and trace width
- Display signals graphically as single channels, in XY-mode or in tables
- Time measuring function with up to 4 markers plus 2 trigger markers
- Jump to time
- Jump to an analog value
- Virtually unlimited number of samples

Part number	
FP Data Analyzer software	AFPS04510D

The connection in ActiveX® technology

Connecting your application to Panasonic PLCs

Main advantages:

- FP Connect provides One ActiveX® control for Microsoft Foundation Classes (MFC), Microsoft.NET (Visual Basic and C#), Office applications and COM applications.
- No knowledge of Panasonic PLC communication protocol (MEWTOCOL) is needed for developing applications which communicate with Panasonic FP series PLCs, no matter which programming language is used: VB, C#, C, HTML, JavaScript, Delphi, etc.
- FP Connect provides many ready-to-use function sets for easy application development.

Control:

- AboutBox
- ShowParameter
- PortOpen
- PortClose
- AttachHostHandle
- ChangeTimeOut

PLC read:

- AreaRead
- ReadBits
- ReadINT
- ReadDINT
- ReadWORD
- ReadDWORD
- ReadREAL
- ReadICCard
- MonitorRead

PLC write:

- AreaWrite
- WriteBits
- WriteINT
- WriteDINT
- WriteWORD
- WriteDWORD
- WriteREAL
- WriteICCard
- WriteSharedMemory

Special commands:

- TransparentMode
- ReadPLCInformation
- ChangePLCMode
- PLC Password
- UploadPLCCode
- DownloadPLCCode

Specifications

- FP Connect available for all Windows operation systems
- Support multiple connections to Panasonic PLCs and HMIs with integrated MEWNET Manager
- Communicate with FP series PLCs using interfaces such as RS232C, RS485, modem, Ethernet
- Read/Write PLC contacts, registers and shares memory
- Up and downloads of PLC programs and system registers
- Provides many high-level commands like ReadPLCInformation for easy data acquisition
- Display or change status of the PLC (RUN/PROG)
- Provide PLC password function

Part number	
Control FP Connect	AFPS37510

One tool for GTs and PLCs to transfer project data without having an engineering system

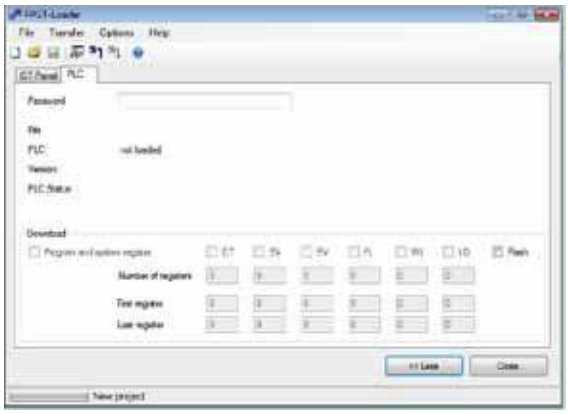
The system information, program and data from Panasonic GT series and FP series can be uploaded with this software tool. The uploaded data can either be downloaded immediately to another GT or PLC of the same type or saved on disk for later usage.

GT features

- Read panel system information
- Upload project file
- Download project file
- Save panel project as single file
- Download firmware

PLC features

- Upload program and data
- Download program and data
- Register types and ranges of variables for up/download freely definable by user
- Include Flash & EEPROM data
- Save PLC project as single file



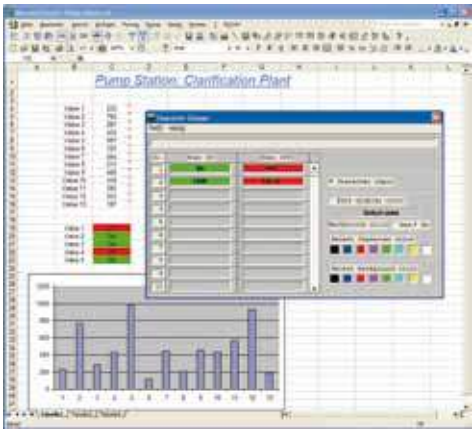
Part number	
FPGT Loader	AFPS77510

PCWAY data monitoring, logging and setting software based on Excel®

PCWAY is a unique add-in software for Microsoft Excel. With PCWAY, it is possible to display PLC data on an Excel sheet. Thereby animated visual displays are possible. It is also possible to display internal matters, such as accumulating data on a file, or a sound. A trigger, which can be a relay or an event, can be used to start such internal tasks. When the trigger changes from OFF to ON, the internal processing tasks start.

Features

- Real-time display of the PLC memory area in the Excel cell
- Changing the PLC memory area directly from the Excel cell
- Saving PLC data to a file and displaying the data saved
- Booting Excel macros automatically
  By combining the macro with PCWAY, it is possible to automatically generate reports or to change the colors of the charts based on the PLC information
- E-mail function
  PCWAY monitors internal relays of the PLC and sends the equipment status information to a PC or a cellular phone via e-mail when the internal relay changes from OFF to ON

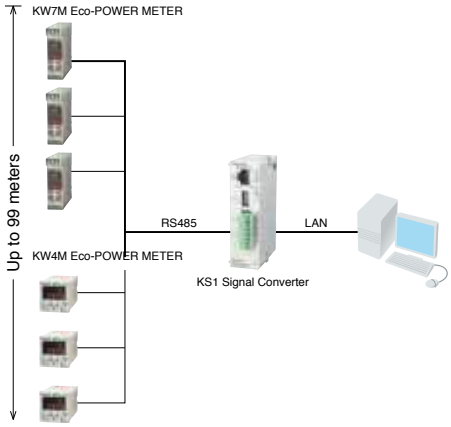


Part number	
PCWAY software with USB port dongle	AFW10031
USB port dongle for PCWAY and CommX	AFW1033

Signal converter for RS232C/RS485 <-> Ethernet

- Easy to connect
  The connectors are located on the front panel
- Easy to configure
  The IP adress can easily be set by using the "Configurator WD" software
- Easy-to-install DIN-rail mountable type

System configurations example



General specifications		
Part number	AKS1202	
Rated voltage	24VDC	
Operating voltage range	90 to 110%V of rated voltage (21.6 to 26.4VDC)	
Rush current	12A or less	
Current consumption	200mA or less	
Allowed momentary power off time	10ms	
Fuse	Built-in type	
Terminal screw	M2	
Ambient temperature	0 to 55°C	
Storage temperature	-20 to +75°C	
Ambient humidity	30 to 85% RH (at 20°C, non-condensing)	
Breakdown voltage	500V AC 1 minute	RS485 terminals as well as combined power and ground terminals
Insulation resistance	100MW or higher (500VDC using an insulation resistance meter)	
Vibration resistance	10 to 55Hz, 1 cycle/min.: double amplitude of 0.75mm, 1 hour on 3 axes	
Shock resistance	294m/s^2 or more, 5 times on 3 axes	
Dimensions (W x D x H)	25 x 60 x 90 mm	
Weight	Approx. 80g	

Communication specifications interface: RS232C and RS485			
Interface		RS232C (non insulated)	RS485 (insulated)
Conversion COM port		COM1	COM2
Communication style		1:1 communication	1:N communication
Number of connectable stations		1 station	99 stations max.
Communication method		Full duplex	Half duplex
Transmission distance		15m	Max. 1200m
Communication speed		2400, 4800, 9600, 19,200, 38,400, 57,600 and 115,200bit/s	
Number of connectable connections		3	3
COM receive time out		Setting range: 10ms to 60s	Setting range: 10ms to 60s
Non-communication time before disconnection		Setting range: 0 to 1800s	
Conversion and transmission format	Data length	8 bits fixed	–
	Parity	Odd/Even/None	
	Stop bit	1 bit/2 bits	
	End code	CR, CR+LF, None	
Ethernet to serial conversion		Command/response system	

Communication specifications interface: ethernet		
Interface		IEEE802.3u, 10BASE-T/100BASE-TX
Connector shape		RJ45
Trans-mission specifica-tions	Transmission speed	10Mbit/s/100 Mbit/s
	Transmission method	Base band
	Max. segment length	100m
Communication cable		Category 5 UTP cable
Protocol		TCP/IP
Functions		Auto negotiation function, MDI/MDI-X, Auto crossover function

FP-e control units

Description	Part number
FP-e control unit, 8 IN/6 OUT (5 NPN, 0.5A ; 1 relay, 2 A), RS232C, 24VDC	AFPE224300
FP-e control unit, 8 IN/6 OUT (5 NPN, 0.5A; 1 relay, 2 A), RS485, 24VDC	AFPE224302
FP-e control unit, 8 IN/6 OUT (5 NPN, 0.5A; 1 relay, 2 A), RS232C, RTC, 24VDC	AFPE224305
FP-e control unit, 6 IN/6 OUT (5 NPN, 0.5A; 1 relay, 2 A;), plus 2 thermocouple input, RS232C, RTC, 24VDC	AFPE214325
FP-e control unit, 6 IN/6 OUT (5 NPN, 0.5A; 1 relay, 2 A;), plus 2 thermocouple input, RS485, 24VDC	AFPE214322
FP-e control unit, 6 IN/6 OUT (5 NPN, 0.5A; 1 relay, 2 A;), plus 2 analog input (0-20mA), RS232C, RTC	AFPE214325T06

FP-e option

Description	Part number
Backup battery	AFPG804
Rubber gasket	ATC18002
Panel cover (black) 20 pcs	AFPE803
Protective cover	AQM4803
Terminal socket set (4 terminal blocks)	AFPE804

FP0R control units

Description	Part number
FP0R C10 control unit, 16k steps, 6 IN/4 OUT relay (2A), screw terminal block, 24VDC	AFP0RC10RS
FP0R C10 control unit with RS232C, 16k steps, 6 IN/4 OUT relay (2A), screw terminal block, 24VDC	AFP0RC10CRS
FP0R-C10 control unit with COM port: RS485(19,2/115,2kbps), Tool port: RS232 & Mini USB, 16k steps, 6 IN (PNP + NPN), 4 OUT relay, screw terminal block, 24VDC	AFP0RC10MRS
FP0R C14 control unit, 16k steps, 8 IN/6 OUT relay (2A), screw terminal block, 24VDC	AFP0RC14RS
FP0R C14 control unit with RS232C, 16k steps, 8 IN/6 OUT relay (2A), screw terminal block, 24VDC	AFP0RC14CRS
FP0R-C14 control unit with COM port: RS485 (19,2/115,2kbps), Tool port: RS232 & Mini USB, 16k steps, 8 IN (PNP + NPN), 6 OUT relay, screw terminal block, 24 VDC	AFP0RC14MRS
FP0R C16 control unit, 16k steps, 8 IN/8 OUT (0.2A), MIL connector, 24VDC	AFP0RC16P (PNP) AFP0RC16T (NPN)
FP0R C16 control unit with RS232C, 16k steps, 8 IN/8 OUT (0.2A), MIL connector, 24VDC	AFP0RC16CP (PNP) AFP0RC16CT (NPN)
FP0R-C16 control unit with COM port: RS485 (19,2/115,2kbps), Tool port: RS232 & Mini USB, 16k steps, 8 IN (PNP + NPN), 8 OUT trans., MIL connector, 24 VDC	AFP0RC16MP (PNP) AFP0RC16MT (NPN)
FP0R C32 control unit, 32k steps, 16 IN/16 OUT (0.2A), MIL connector, 24VDC	AFP0RC32P (PNP) AFP0RC32T (NPN)
FP0R C32 control unit with RS232C, 32k steps, 16 IN/16 OUT (0.2A), MIL connector, 24VDC	AFP0RC32CP (PNP) AFP0RC32CT (NPN)
FP0R-C32 control unit with COM port: RS485 (19,2/115,2kbps), Tool port: RS232 & Mini USB, 32k steps, 16 IN (PNP + NPN), 16 OUT trans., MIL connector, 24VDC	AFP0RC32MP (PNP) AFP0RC32MT (NPN)
FP0R T32 control unit with RS232C, 32k steps, 16 IN/16 OUT (0.2A), RTC, MIL connector, 24VDC	AFP0RT32CP (PNP) AFP0RT32CT (NPN)
FP0R-T32 control unit with COM port: RS485 (19,2/115,2kbps), Tool port: RS232 & Mini USB, 32k steps, 16 IN (PNP + NPN), 16 OUT trans., MIL connector, RTC, buffered RAM, 24VDC	AFP0RT32MP (PNP), AFP0RT32MT (NPN)
FP0R F32 control unit with RS232C, 32k steps, 16 IN/16 OUT (0.2A), battery-less data backup 24VDC	AFP0RF32CP (PNP) AFP0RF32CT (NPN)
FP0R-F32 control unit with COM port: RS485 (19,2/115,2kbps), Tool port: RS232 & Mini USB, 32k steps, 16 IN (PNP + NPN), 16 OUT trans., MIL connector, RTC, flash RAM, 24VDC	AFP0RF32MP (PNP) , AFP0RF32MT (NPN)

FPΣ (Sigma) control units

Description	Part number
FPG-C24R2 control unit, 32k steps, 16 IN/8 relay OUT, terminal block, 24VDC	FPG-C24R2H
FPG-C28P2 control unit, 32k steps, 16 IN/12 OUT transistor (PNP), MIL connector, 24VDC	FPG-C28P2H
FPG-C32T2 control unit, 32k steps, 16 IN/16 OUT transistor (NPN), MIL connector, 24VDC	FPG-C32T2H
FPG-C24R2TM control unit, 32k steps, 16 IN/8 relay OUT, plus 2 thermistor input, terminal block, 24VDC	FPGC24R2HTM
FPG-C28P2TM control unit, 32k steps, 16 IN/12 OUT transistor (PNP), plus 2 thermistor input, MIL connector, 24VDC	FPGC28P2HTM
FPG-C32T2TM control unit, 32k steps, 16 IN/16OUT transistor (NPN), plus 2 thermistor input, MIL connector, 24VDC	FPGC32T2HTM

FPΣ (Sigma) serial communication cassettes/modules

Description	Part number
FPG-COM1 cassette, 1x RS232C (5 pin)	FPG-COM1
FPG-COM2 cassette, 2x RS232C (2x 3pin)	FPG-COM2
FPG-COM3 cassette, 1x RS485 (3 pin)	FPG-COM3
FPG-COM4 cassette, 1x RS232C (3 pin) and 1x RS485 (2 pin, 19.2 and 115.2kBaud)	FPG-COM4
FPG-COM4 cassette, 1x RS232C (3 pin) and 1xRS485 (2 pin, 2.4 and 9.6kBaud)	AFPG806T17
FPG-SDU module, 3x RS485 (5 pin), terminal block, 300bit/s to 115,2kbit/s	AFPG951T34

FPΣ (Sigma) option

Description	Part number
FPG-EM1 data memory expansion unit, 256k Words (512k Byte)	FPGEM1
Battery for FPΣ (Sigma)/FP-e and AX30/AX40 (CR2025/S5P)	AFPG804

FPΣ (Sigma) digital expansion units (left side)

Description	Part number
FPG-XY64D2P expansion, 32 IN/ 32 OUT transistor (PNP), MIL connector, 24VDC	FPG-XY64D2P
FPG-XY642DT expansion, 32 IN/ 32 OUT transistor (NPN), MIL connector, 24VDC	FPG-XY64D2T

FPΣ (Sigma) analog expansion units (left side)

Description	Part number
FPΣ (Sigma) analog expansion, 4*16bit IN (0-10V; 0-20mA with 50 ohm resistance) and 4x12bit OUTPUT (0-10V, -10 to +10V; 4 to 20mA), MIL connector, 24VDC	FPGAD44D50
FPΣ (Sigma) expansion, 4*16bit IN (0-10V; 0-20mA with 250 ohm resistance) and 4x12bit OUTPUT (0-10V, -10 to +10V; 4 to 20mA), MIL connector, 24VDC	FPGAD44D250

FPΣ (Sigma) motion control

Description	Part number
FPG-PP11, 1-axis motion control unit with transistor outputs	FPGPP11
FPG-PP12, 1-axis motion control unit with line driver outputs	FPGPP12
FPG-PP21, 2-axis motion control unit with transistor outputs	FPGPP21
FPG-PP22, 2-axis motion control unit with line driver outputs	FPGPP22
FPG-PN2AN, 2-axis RTEX motion control unit	FPGPN2AN
FPG-PN4AN, 4-axis RTEX motion control unit	FPGPN4AN
FPG-PN8AN, 8-axis RTEX motion control unit	FPGPN8AN
RTEX configuration software	AFPS66510

FP0R/FPΣ (Sigma)/FP-X digital expansion units (right side)

Description	Part number
FP0R-E8 expansion unit, 8 input, MIL connector, 24VDC	FP0RE8X
FP0R-E8 expansion unit, 4 input / 4 relay output, terminal block, 24VDC	FP0RE8RS
FP0R-E8 expansion unit, 8 relay output, terminal block, 24VDC	FP0RE8YRS
FP0R-E8 expansion unit, 8 transistor output, MIL connector, 24VDC	FP0RE8YP (PNP), FP0RE8YT (NPN)
FP0R-E16 expansion unit, 16 input, MIL connector, 24VDC	FP0RE16X
FP0R-E16 expansion unit, 8 input / 8 relay output, terminal block, 24VDC	FP0RE16RS
FP0R-E16 expansion unit, 8 input / 8 transistor output, MIL connector, 24VDC	FP0RE16P (PNP), FP0RE16T (NPN)
FP0R-E16 expansion unit, 16 transistor output, MIL connector, 24VDC	FP0RE16YP (PNP), FP0RE16YT (NPN)
FP0R-E32 expansion unit, 16 input / 16 transistor output, MIL connector, 24VDC	FP0RE32P (PNP), FP0RE32 (NPN)

FP0R/FPΣ(Sigma)/FP-X analog expansion units (right side)

Description	Part number
FP0 analog I/O unit, input 2 points (0 to 5V, -10 to +10V, 0 to 20mA); output 1 point (-10 to +10V, 0 to 20mA); resolution 12 bits, 24VDC	FP0-A21
FP0 A/D converter unit, analog input 8 points (0-5V, -10 to +10V, -100 to +100V, 0 to 20mA), resolution 12 bits, 24VDC	FP0-A80
FP0 D/A converter unit, analog output 4 points: FP0-A04V: -10 to +10V (12bits) FP0-A04I: 4 to 20mA (12bits)	FP0-A04V FP0-A04I

FP0R/FPΣ(Sigma)/FP-X temperature units (right side)

Description	Part number
FP0 thermocouple unit, resolution: 0.1°C, 4 input channels, -100°C to +1500°C	FP0TC4
FP0 thermocouple unit, resolution: 0.1°C, 8 input channels, -100°C to +1500°C	FP0TC8
FP0 RTD unit, Pt100, Pt1000, Ni1000, 6 input channels (3-wire), -200°C to +500°C, resolution 0.1°C	FP0RTD6

FP0R/FPΣ(Sigma) cables and accessories

Description	Part number
I/O cable with 10pin MIL connector and 10 wires, set of two cables (1x blue, 1x white), 1m	AFP0521D
I/O cable with 10pin MIL connector and 10 wires, set of two cables (1x blue, 1x white), 3m	AFP0523D
I/O cable with 10pin MIL connector and 10 wires, set of two cables (blue), 1m	AFP0521BLUED
I/O cable with 10pin MIL connector and 10 wires, set of two cables (blue), 3m	AFP0523BLUED
I/O cable with 10pin MIL connector and 10 wires, set of two cables (orange),1m	AFP0521ORANGED
I/O cable with 10pin MIL connector and 10 colored wires, set of two cables, 1m	AFP0521COLD
I/O cable with 10pin MIL connector and 10 colored wires, set of two cables, 2m	AFP0522COLD
I/O cable with 40pin MIL connector and 40 blue wires, 1m	AYT58403BLUED
I/O cable with 40pin MIL connector and 40 blue wires, 3m	AYT58406BLUED
I/O cable with 40pin MIL connector and 40 colored wires based on DIN 47100, 1m	AYT58403COLD
I/O cable with 40pin MIL connector and 40 colored wires based on DIN 47100, 3m	AYT58406COLD
Power supply cable for FPWEB2, FP0R and FPΣ (Sigma), 1m	AFPG805J
Power supply cable for FP0/FP0R, FP Modem-56k, 1m	AFP0581J
Plastic plate to mount FPΣ (Sigma) units and expansion units on a panel, 10 pcs per set	AFP0811
Plastic plate to mount FP0 expansion units on a wall (including 10 pieces)	AFP0803
FPΣ (Sigma) high capacity battery holder. Battery CR123A is not included.	AFPG807
Backup battery for FPΣ (Sigma)	AFPG804
FP Memory Loader, data clear type	AFP8670
FP Memory Loader, data hold type	AFP8671
Wire-press socket, attaches to transistor output type. Maintenance part. (2 sockets per pack)	AFP0807
Multi-wire connector pressure contact tool for MIL connection	AXY52000FP

FP-X control units

Description	Part number
FP-X C14R control unit, 8 IN (24VDC)/6 OUT (2A relay), terminal block, 230VAC	AFPXC14R
FP-X C14RD control unit, 8 IN (24VDC)/6 OUT (2A relay), terminal block, 24VDC	AFPXC14RD
FP-X C14 control unit, 8 IN (24VDC)/6 OUT (transistor, 0.5A), terminal block, 230VAC	AFPXC14P (PNP), AFPXC14T (NPN)
FP-X C14 control unit, 8 IN (24VDC)/6 OUT (transistor, 0.5A), terminal block, 24VDC	AFPXC14PD (PNP), AFPXC14TD (NPN)
FP-X C30R control unit, 16 IN (24VDC)/14 OUT (2A relay), terminal block, 230VAC	AFPXC30R
FP-X C30R control unit, 16 IN (24VDC)/14 OUT (2A relay), terminal block, 24VDC	AFPXC30RD
FP-X C30 control unit, 16 IN (24VDC)/14 OUT (transistor, 0.5A), terminal block, 230VAC	AFPXC30P (PNP), AFPXC30T(NPN)
FP-X C30 control unit, 16 IN (24VDC)/14 OUT (transistor, 0.5A), terminal block, 24VDC	AFPXC30PDJ(PNP), AFPXC30TDJ(NPN)
FP-X C38 control unit, 32k steps, 24 IN (24VDC) /14 OUT (transistor NPN, 0.5A), 4AI (0..10V or 0..20mA, 12bBit) a. 2AO (0..10V or 0..20mA, 12Bit), screw and spring terminal, 230VAC	AFPX-C38AT

FP-X control units

Description	Part number
FP-X C60R control unit, 32 IN (24VDC)/28 OUT (2A relay), terminal block, 230V AC	AFPXC60R
FP-X C60R control unit, 32 IN (24VDC)/28 OUT (2A relay), terminal block, 24VDC	AFPXC60RD
FP-X C60 control unit, 32 IN (24VDC)/28 OUT (transistor, 0.5A), terminal block, 230V AC	AFPXC60P (PNP), AFPXC60T (NPN)
FP-X C60 control unit, 32 IN (24VDC)/28 OUT (transistor, 0.5A), terminal block, 24VDC	AFPXC60PD (PNP), AFPXC60TD (NPN)

FP-X expansion units

Description	Part number
FP-X E16R expansion unit, 8 IN (24VDC)/8 OUT (2A relay), terminal block	AFPXE16R
FP-X E16 expansion unit, 8 IN (24VDC)/8 OUT (transistor, 0.5A), terminal block	AFPXE16P (PNP), AFPXE16T (NPN)
FP-X E16X expansion unit, 16 IN (24VDC), terminal block	AFPX-E16X
FP-X E14YR expansion unit, 14 OUT (2A relay), terminal block	AFPX-E14YR
FP-X E30R expansion unit, 16 IN (24VDC)/14 OUT(2A relay), terminal block, 230VAC	AFPXE30R
FP-X E30RD expansion unit, 16 IN (24VDC)/14 OUT(2A relay), terminal block, 24VDC	AFPXE30RD
FP-X E30 expansion unit, 16 IN (24VDC)/14 OUT (transistor, 0.5A), terminal block, 230VAC	AFPXE30P (PNP), AFPXE30T (NPN)
FP-X E30 expansion unit, 16 IN (24VDC /14 OUT (transistor, 0.5A), terminal block, 24VDC	AFPXE30PD (PNP), AFPXE30TD (NPN)
Adapter for connecting FP0 expansion units, 24VDC	AFPXEFP0

FP-X add-on cassettes

Description	Part number
FP-X I/O cassette, 4 IN (24 VDC)/4 OUT (NPN, 0.3A), terminal block	AFPX-IN4T3
FP-X input cassette, 8 IN (24VDC), terminal block	AFPXIN8
FP-X output cassette, 6 OUT (PNP, 0.5A), terminal block	AFPXTR6P (PNP)
FP-X output cassette, 8 OUT (NPN, 0.3A), terminal block	AFPXTR8 (NPN)
FP-X pulse I/O cassette, HSC input (single-phase 2 ch., each 80kHz or two-phase 1ch., 30 kHz, pulse output: one axis 100kHz/ch. Cannot be used with a transistor output control unit.	AFPXPLS
FP-X analog input cassette, 2 inputs (0 to10V or 0 to 20mA, 12-bit, 2ms/2ch.)	AFPXAD2
FP-X analog output cassette, 2 outputs (0 to10V or 0 to 20mA, 12-bit, 2ms/2ch.)	AFPX-DA2
FP-X analog I/O cassette, 2 ch. inputs (0 to 10V or 0 to 20mA, 12-bit, 2ms/2ch.), 1 ch. output (0-10V or 0-20mA, 12bit, 1ms/ch) (insulated)	AFPX-A21
FP-X thermocouple input cassette, 2-point thermocouple input, K/J type, -50°C to +500°C, resolution 0.2°C, 200 ms/2 ch. (insulated)	AFPX-TC2
FP-X RTD cassette, 2-point RTD input, PT100, -200°C to +850°C, resolution 0.1°C	AFPX-RTD2
FP-X master memory cassette with a real-time clock	AFPXMRTC
FP-X COM1 communication cassette, 1ch. RS232C (5 pin)	AFPXCOM1
FP-X COM2 communication cassette, 2ch. RS232C (2 x 3 pin)	AFPXCOM2
FP-X COM3 communication cassette, 1ch. RS485 (3 pin)	AFPXCOM3
FP-X COM4 communication cassette, 1ch. RS232C (3 pin) and 1ch. RS485 (2 pin)	AFPXCOM4
FP-X COM5 communication cassette, 1ch. Ethernet (10Base-T, 100Base-TX) and 1ch. RS232C (3 pin)	AFPXCOM5
FP-X COM6 communication cassette, 2x RS485, 115.2 kbit/s	AFPXCOM6
Control Configurator WD, tool software for setting the Ethernet port of the COM5 communication cassette	Free to download from our homepage

FP-X options

Description	Part number
FP-X backup battery for backing up the operation memory and real-time clock	AFPXBATT
FP-X expansion cable	AFPXEC08 (8 cm), AFPXEC30 (30cm), AFPXEC80 (80cm)
FP-X terminal block for C30, C60 and E30, 21 pins, cover with no marking, set of 5 pcs.	AFPXTAN1

FP-X0 control units

Description	Part number
FP-X0L14R control unit, 8 IN (24 VDC relay), 2 OUT (0.5 A/5 to 24 VDC transistor), 4 OUT (2 A relay), 100 to 240 VAC	AFPX0L14R
FP-X0L30R control unit, 16 IN (24 VDC relay), 4 OUT (0.5 A/5 to 24 VDC transistor), 10 OUT (2 A relay), 100 to 240 VAC	AFPX0L30R
FP-X0L40MR control unit, 24 IN (24 VDC relay), 4 OUT (0.5 A/5 to 24 VDC transistor), 12 OUT (2 A relay), AI (10 bits 2 channel), RS485, RTC, 100 to 240 VAC	AFPX0L40MR
FP-X0L40R control unit, 24 IN (24 VDC relay), 4 OUT (0.5 A/5 to 24 VDC transistor), 12 OUT (2 A relay), AI (10 bits 2 channel), RTC, 100 to 240 VAC	AFPX0L40R
FP-X0L60MR control unit, 32 IN (24 VDC relay), 4 OUT (0.5 A/5 to 24 VDC transistor), 24 OUT (2 A relay), AI (10 bits 2 channel), RS485, RTC, 100 to 240 VAC	AFPX0L60MR
FP-X0L60R control unit, 32 IN (24 VDC relay), 4 OUT (0.5 A/5 to 24 VDC transistor), 24 OUT (2 A relay), AI (10 bits 2 channel), RTC, 100 to 240 VAC	AFPX0L60R

FP0R/FPΣ (Sigma)/FP-X network communication

Description	Part number
FP Web-Server 2, Ethernet with 10/100MBit/s and Modem interface	FPWEB2
FP Web Expansion Unit for FPWEB2	FPWEBEXP
IEC license for FPWEB2	IEC60870LIS
Control FP WEB configurator tool version 2	FPWEBTOOL2D
FP Web Designer, economy version	AFPS36510-E
FP Web Designer, basic version	AFPS36510-B
FP Web Designer, extended version	AFPS36510-X
FP Web Designer, upgrade from economy to basic version	AFPS36510-E2B
FP Web Designer, upgrade from economy to extended version	AFPS36510-E2X
FP Web Designer, upgrade from basic to extended version	AFPS36510-B2X
Connection cable from FP series PLC's tool port to FPWEB2, 2m	AIGT8192
FPΣ (Sigma) PROFIBUS DP master unit	FPG-DPV1-M
FPΣ (Sigma) DeviceNet master unit	FPG-DEV-M
FPΣ (Sigma) CANopen master unit	FPG-CAN-M
Control configurator FM for fieldbus master units	AFPS35510
FPΣ (Sigma) PROFIBUS DP slave unit	FPG-DPV1-S
FPΣ (Sigma) DeviceNet slave unit	FPG-DEV-S
FPΣ (Sigma) CANopen slave unit	FPG-CAN-S
FPΣ (Sigma) PROFINET I/O slave unit	FPG-PRT-S
FPΣ (Sigma) BACnet-IP slave unit. 10/100 Mbps	FPG-BACIP-S
FPΣ (Sigma) BACnet-MSTP slave unit. 9600 to 76.800 Mbps	FPG-BACMSTP-S
FP0/FP0R PROFINET DP slave unit, or works as remote IO unit without controller	FP0DPS2D
MEWNET-F slave unit	FP0IOL
FPΣ (Sigma) S-Link master unit as expansion	FPGSL
FPΣ (Sigma) CC-Link slave unit as expansion	FPGCCL
C-NET Adapter (RS232C/RS422), 100 to 240VAC	AFP8536CEJ
C-NET module (RS485) S2-Type, 30cm cable for FP0/FPΣ (Sigma)/FP2 Tool port	AFP15402J
Communication cable, FP series PLC Com port to FP2/2SH COM port / FP C-Net adapter, 2m	AIP81842D
Programming cable for FP and GT series (9-pin Sub-D to 5-pin miniDIN), L type, 3m	AFC8513D
FP Modem-56k (56kBaud, V.23/V.32bis/V.34/V.90, RS232/RS485)	FP-modem-56k
RS232C cable for FP Modem-56k/FP-Safe <---> FP series PLC COM port (3 pins), 0.5m	CABMODPLC111D
RS232C cable for FP Modem-56k/FP-Safe <---> FP series PLC COM port (9 pins), 0.5m	CABMODPLC211D
RS232C cable for FP Modem-56k/FP-Safe <---> FP series PLC tool port (5 pins), 2m	CABMODPLC311D
RS232C cable for FP Modem-56k/FP-Safe <---> FP series PLC tool port (5 pins), 0.5m	AFS8TP
KS1 signal converter, Ethernet <-> RS232C/RS485, 24VDC	AKS1202

24VDC power supply units

Description	Part number
Power Supply Unit 24W (primary 100 to 240V AC, 2 x secondary 24VDC/1A, short circuit protected)	FP-PS24-024E
Power Supply Unit 60W (primary 100 to 240V AC, 2 x secondary 24VDC/2.5A, short circuit protected)	FP-PS24-060E
Power Supply Unit 120W (primary 100 to 240V AC, 2 x secondary 24VDC/5A, short circuit protected)	FP-PS24-120E

FP2SH control units (built-in RAM)

Description	Part number
FP2SH controller unit with COM port 32k steps, RTC, battery included	FP2C2LJ
FP2SH controller unit with COM port, 60k steps, RTC, battery included	FP2C2J
FP2SH controller unit with COM port, 60k steps, IC memory card interface, RTC, battery included	FP2C2PJ
FP2SH controller unit with COM port, 120k steps, IC memory card interface, RTC, battery included	FP2C3PJ

FP2H optional memory

Description	Part number
FP2SH F-ROM Memory Unit	AFP2208
IC card, 2MB, SRAM	AFP2209

FP2SH backplane

Description	Part number
Conventional type, 5-module type (for basic)	FP2BP05
Conventional type, 7-module type (for basic and expansion)	FP2BP07
Conventional type, 9-module type (for basic and expansion)	FP2BP09
Conventional type, 12-module type (for basic and expansion)	FP2BP12
Conventional type, 14-module type (for basic and expansion)	FP2BP14
FP2H expansion cable, 0.6m	FP2ECJ
FP2SH expansion cable, 2m	FP2EC2J
H type 8 slots (for basic)	FP2-BP11MH
H type 8 slots (for expansion)	FP2-BP10EH

FP2SH power supply unit

Description	Part number
FP2SH power supply unit, input: 100 to 120VAC, output: 2.5A	FP2PSA1J
FP2SH power supply unit, input: 200 to 240VAC, output: 2.5A	FP2PSA2J
FP2SH power supply unit, input: 100 to 240VAC, output: 5A	FP2PSA3J
FP2SH power supply unit, input: 24 VDC, output: 5A	FP2PSD2J

FP2SH analog expansion unit

Description	Part number
FP2SH analog output unit, 4 ch. resolution 12 bits, (-10V to +10V/0…20mA)	FP2DA4J
FP2SH analog input unit, 8 ch. resolution 13-16 bits, (+-10V, PT100, PT1000)	FP2AD8X
FP2SH analog input unit, 8 ch. resolution 13-16 bits, (4 to 20mA, -10V to +10V)	FP2AD8VIJ
FP2SH analog RTD input unit, 8 ch. PT100/PT1000	FP2RTDJ

FP2SH digital I/O expansion unit

Description	Part number
FP2SH DUMMY UNIT	FP2DMJ
FP2SH input unit, 16 IN (12-24VDC)	FP2X16D2J
FP2SH input unit, 32 IN (12-24VDC)	FP2X32D2J
FP2SH input unit, 64 IN (12-24VDC)	FP2X64D2J
FP2SH output unit, 6 OUT relay, 5A 250VAC(10A/common), 5A 30VDC(10A/common)	FP2Y6RJ
FP2SH output unit,16 OUT relay, 2A 250V AC (5A/common), 2A 30VDC (5A/common)	FP2Y16RJ
FP2SH output unit, 16 OUT transistor, 0.5A (12-24VDC), 0.1A (5VDC)	FP2Y16PJ (PNP), FP2Y16TJ (NPN)
FP2SH output unit, 32 OUT transistor, 0.1A (12-24VDC), 50 mA (5VDC)	FP2Y32PJ (PNP), FP2Y32TJ (NPN
FP2SH output unit, 64 OUT transistor, 0.1A (12-24VDC), 50 mA (5VDC)	FP2Y64PJ (PNP), FP2Y64TJ (NPN)
FP2SH I/O unit, 32 IN (24VDC), 32 OUT transistor, 0.1A (12-24VDC), 50 mA (5VDC)	FP2XY64D2PJ (PNP), FP2XY64D2TJ (NPN)
FP2SH I/O unit, 32 IN (24VDC), 32 OUT transistor, 0.1A (12-24VDC), 50 mA (5VDC), with on pulse catch input	FP2XY64D7PJ (PNP), FP2XY64D7TJ (NPN)

FP2SH positioning unit, high-speed counter and pulse I/O unit

Description	Part number
FP2SH positioning unit multifunction type, transistor output, 2 axes, independent	FP2PP21J
FP2SH positioning unit multifunction type, line drive output, 2 axes, independent	FP2PP22J
FP2SH positioning unit multifunction type, transistor output, 4 axes, independent	FP2PP41J
FP2SH positioning unit multifunction type, line drive output, 4 axes, independent	FP2PP42J
FP2SH positioning unit RTEX, network type, 2 axes	FP2PN2AN
FP2SH positioning unit RTEX, network type, 4 axes	FP2PN4AN
FP2SH positioning unit RTEX, network type, 8 axes	FP2PN8AN
Software RTEX Control configurator PM	AFPS66510
FP2SH positioning unit, interpolation type, transistor output, 2 axes (linear/circular, synchronization)	FP2-PP2T
FP2SH positioning unit, interpolation type, transistor output, 4 axes (2 axes linear/ 2 axes circular, 3 axes helical interpolation, 2 axes synchronization)	FP2-PP4T
FP2SH positioning unit, interpolation type, line drive output, 2 axes (linear/circular, synchronization)	FP2-PP2L
FP2SH positioning unit, interpolation type, line drive output, 4 axes (2 axes linear/ 2 axes circular, 3 axes helical interpolation, 2 axes synchronization)	FP2-PP4L
FP2SH high-speed counter unit, 8 interrupt inputs, 4-channel HSC, 8 comparison outputs, input: 24VDC, output: 5 to 24VDC (0.1A, 12 points/0.8A, 4 points)	FP2HSCT (NPN) FP2HSCP (PNP)
FP2SH pulse I/O unit, 8 interrupt inputs, 4-channel HSC, 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)	FP2PXYTJ (NPN) FP2PXYPJ (PNP)

FP2SH cables and accessoiries

Description	Part number
FP2SH connector set - loose wiring pressure	AFP2801J
FP2SH connector set - flat cable socket	AFP2802J
I/O cable with 40pin MIL connector and 40 blue wires, 1m	AYT58403BLUED
I/O cable with 40pin MIL connector and 40 blue wires, 3m	AYT58406BLUED
I/O cable with 40pin MIL connector and 40 colored wires based on DIN 47100, 1m	AYT58403COLD
I/O cable with 40pin MIL connector and 40 colored wires based on DIN 47100, 3m	AYT58406COLD
Battery for FP2SH, button type battery, CR2450 or equivalent	AFC8801
Battery for FP2SH CPU unit, battery with cable	AFP8801

FP Memory Loader

Description	Part number
FP Memory Loader, data non-hold type	AFP8670
FP Memory Loader, data hold type	AFP8671

FP2SH network communication

Description	Part number
FP2SH VE-link unit, MEWNET-VE Link unit (VE mode and FL-net mode) using Ethernet cable (10BaseT)	FP2-VE2
FP2SH ET-LAN unit, Ethernet LAN (10BaseT, 100BaseT, TCP/IP, UDP/IP, MEWTOCOL)	FP2-ET2
Ethernet configurator software for ET-LAN	AFPS32510J
FP2SH multi-wire link unit, compatible with MEWNET-W/MEWNET-W2, can connect as the remote I/O system MEWNET-F master station	FP2MWJ
FP2SH multi-communication unit, up to two blocks to be attached (RS485/ RS232C/ RS422 blocks, ASCII-MEWTOCOL. COM/DAT)	FP2MCU
FP2SH RS232C communication block for FP2MCU, 300 to 230,400bps, 15m max.	FP2CB232
FP2SH RS422 communication block for FP2MCU, 300 to 230,400bps, 1200m max.	FP2CB422
FP2SH RS485 communication block for FP2MCU, 300 to 230,400bps, 1200m	FP2CB485
FP2SH S-Link unit, 128 points per one unit	FP2SL2J
FP2SH computer communication unit, for 1:1 communication between FP2 and a computer, RS232C x 2ch. connection with a control panel is also possible	FP2CCU
FP2SH serial data unit, for communication with general-purpose RS232C devices	FP2SDU
FP2SH PROFIBUS DP master unit	FP2-DPV1-M
FP2SH DeviceNet master unit	FP2-DEV-M
FP2SH CANopen master unit	FP2-CAN-M
Control Configurator FM for fieldbus master units	AFPS35510
FP2SH PROFIBUS DP slave unit	FP2-DPV1-S
FP2SH DeviceNet slave unit	FP2-DEV-S
FP2SH CANopen slave unit	FP2-CAN-S
FP2SH PROFINET I/O slave unit	FP2-PRT-S
FPWEB2 (see page 57)	
FP-Modem-56k (see page 57)	

Control FPWIN Pro

Description	Part number
Control FPWIN Pro programming software, version 6, full version for all FP series PLCs	FPWINPRO6-FULL
Control FPWIN Pro programming software, version 6, small version (not useful for FP2/FP2SH)	FPWINPRO6-SMALL
Control FPWIN PRO upgrade to full version 6	FPWINPROF6-UPGRADE
Control FPWIN PRO upgrade to small version 6	FPWINPROS6-UPGRADE
Ethernet Library	NCL-ET1-LIB
Process and Temperature Control Library	NCL-PTC-LIB
Motion Control Library	NCL-MC-LIB
Modbus library, master and slave functionality	NCL-MODBUS-LIB
Control Configurator MS open version	NCLCCMSLIB
Sun Position Library	NCL-SUN-LIB
More ready-made libraries are available for download from internet: www.panasonic-electric-works.com	–
More application specific ready-made libraries are available, please contact our sales and support team: Contact information: www.panasonic-electric-works.com	Example: telecontrol
Programming cable (FP0R/FP0/FP-e/FPG/FPX/FP2 Tool port to PC) miniDIN5 to 9-pin Sub-D; 2m	AFC8513D
Cable with USB 1.1 to RS232 with 9-pin Sub-D converter; 2m	CABUSBSER9D
Programming cable: USB A to USB B, 2m	AFPXCABUSB2D
Programming cable, USB A to mini USB B (5pin), 2m, USB2.0 compatible	CABMINIUSB5D

Other software products

Description	Part number
FPWEB Configurator Tool ver. 2	FPWEBTOOL2
FP Web Designer, economy edition – HTML visualization for FPWEB2, limited for 250 process points, 15 views, 1 offline trend + 1 alarm	AFPS36510-E
FP Web Designer, basic edition – HTML visualization for FPWEB2, limited for 500 process points, 30 views, 3 offline trends + 1 alarm	AFPS36510-B
FP Web Designer, extended edition – HTML visualization for FPWEB2, no limitation	AFPS36510-X
FP Web Designer, upgrade from economy edition to basic edition	AFPS36510-E2B
FP Web Designer, upgrade from economy edition to extended edition	AFPS36510-E2X
FP Web Designer, upgrade from basic edition to extended edition	AFPS36510-B2X
Control Configurator FM for Fieldbus Master Units	AFPS35510
Control Configurator MS, Setup software for alarm message system based on FP0R	AFPS34610D
Configurator ET, for FP2-ET2	AFPS32510D
Control Configurator WD for Ethernet configuration DLU, GT32T1, AFPX-COM5 and KS1, free download from www.panasonic-electric-works.com/peweu/en/html/	Control Configurator WD
Configurator for switching FP0R mode to FP0 mode, free download from internet	Configurator FP0R mode <-> FP0 mode
FP OPC Server	AFPS03510D
FP Data Analyzer, monitoring software for all FP series PLCs	AFPS04510
PCWAY software + USB port dongle: Data monitoring in Excel format	AFW10031J
USB port dongle for PC Way software	AFW1033J
FP GT loader: up/download all programs and data from FP series PLCs and GT panels	AFPS77510
FP Connect software: One ActiveX control for MFC, Visual Basic and C#, Office applications and COM applications to communicate with FP series PLCs	AFPS37510
FP Web Designer, upgrade from economy to economy version 6.10	AFPS36510-E2E-UPG
FP Web Designer, upgrade from basic to basic edition version 6.10	AFPS36510-B2B-UPG
FP Web Designer, upgrade from extended to extended version 6.10	AFPS36510-X2X-UPG

Connection technology: UM connector terminal

Description	Part number
UM connector – terminal without LED (8 I/O connection to PLC, via flat cable to FP0/FP0R/FPG)	UM45-FLK14PLC
UM connector – terminal with LED (8 I/O connection to PLC, via flat cable to FP0/FP0R/FPG)	UM45-FLK14LAPLC
Flat cable with connector, UM (14 pins) <-> FP0R/FPG input connector (10 pins)	CABUM45005X (0.5m), CABUM4501X (1m), CABUM4503X (3m)
Flat cable with connector, UM (14 pins) <-> FP0R/FPG output connector (10 pins)	CABUM45005Y (0.5m), CABUM4501Y (1m), CABUM4503Y (3m)

Connection technology: PLC relay terminal

Description	Part number
PLC relay terminal with 8 relays (changeover contact with screw terminal) for connecting to FP-series PLCs	PLC-BSC
Flat cable with connector, PLC-BSC (14 pins) <-> FP0/FP0R (10 pins), 3m	CABPLCBSC03
Relay terminal with 8 relays (changeover contact with screw terminal) for connecting to FP-series PLCs	AFPRT8
Flat cable with connector, AFPCT10PINS/AFPRT8 (10 pins) <-> FP0/FPG I/O (10 pins), 1m	CABAFPCT10PINS
FP0-RT80-6A, relay terminal with 8 relays AC250V/2A, MC connector	FP0-RT8Y-6A

Connection technology: MMFP power relay terminal

Description	Part number
Flat cable with connector, MMFP30R <-> PLC, 40 pins, 1m	FC40FF/1

Please refer to connection technology catalog for details.

Connection technology: MF connector terminal

Description	Part number
MF20 connector terminal (20 screw terminal connection using 20-pin header)	MF20MD
MF40 connector terminal (40 screw terminal connection using 40-pin header)	MF40MD
Flat cable with connector, MF40MD <-> PLC, 40 pins, 1m	FC40FF/1
Flat cable with connector, AFPRT8/AFPCT10PINS <-> PLC, 40 pin via 4x 10 pin, 1m	AFP0541
Connector terminal with LED (8 connection via flat cable to FP0/FPG)	AFPCT10PINS
Flat cable with connector, AFPCT10PINS/AFPRT8 (10 pins) <-> FP0/FPG I/O (10 pins), 1m	CABAFPCT10PINS

Connection technology: RT3 relay terminal

Description	Part number
RT3S relay terminal with 4 exchangable realy, 24VDC coil, screw terminal, max. switching power: 30VDC, 250VAC, 2A	RT3S24J
RT3S PhotoMOS relay terminal with 4 exchangable relays, 24VDC coil, screw terminal, max. switching power: 30VDC, 2A	RT3SP124J
RT3S PhotoMOS relay terminal with 4 exchangable relays, 24VDC coil, screw terminal, max. switching power: 30VDC, 250VAC, 0.3A	RT3SP224J

FP-Safe, safety solution for FP-series PLCs

Description	PFHd	Part number
FP-Safe controller, 16 redundant digital Inputs, 4 redundant outputs (PNP) and 3 freely configurable outputs (PNP), spring terminal, 24VDC	5.20×10^{-9}	AFSC1605
FP-Safe controller with relay expansion unit, 16 redundant digital Inputs, 4 redundant outputs (PNP) and 3 configurable outputs (PNP), 4 safety relay outputs (each contains 2 redundant contacts and 1 signaling contact), spring terminal, 24VDC	1.04×10^{-8}	AFSCR1613
FP-Safe controller with transistor I/O expansion unit, 24 redundant digital inputs, 4 redundant outputs (PNP), 13 freely configurable outputs (PNP), spring terminal, 24VDC	9.46×10^{-9}	AFSCP2410
FP-Safe controller with Motion Monitoring Unit, 22 redundant digital inputs, 2 inputs for 2 incremental measuring systems, 4 redundant and 7 freely configurable outputs (PNP), spring terminal, 24VDC	9.46×10^{-9}	AFSCM2207
FP-Safe controller with Relay and Motion Monitoring Unit, 22 redundant digital inputs, 2 inputs for 2 incremental measuring systems, 4 redundant and 7 freely configurable outputs (PNP), 4 safety relay outputs, spring terminal, 24VDC	1.47×10^{-8}	AFSCRM2215
FP-Safe controller with transistor I/O expansion and motion monitoring unit, 30 redundant digital inputs, 2 inputs for 2 incremental measuring systems, 4 redundant and 17 freely configurable outputs (PNP), spring terminal, 24VDC	1.37×10^{-8}	AFSCPM3012
FP-Safe controller with relay expansion unit and transistor I/O expansion unit, 24 redundant digital inputs, 4 redundant and 13 freely configurable outputs (PNP), 4 safety relay outputs, spring terminal, 24VDC	1.47×10^{-8}	AFSCRP2418
FP-Safe controller with relay expansion unit and transistor I/O expansion unit and motion monitoring unit, 30 redundant digital inputs, 2 inputs for 2 incremental measuring systems, 4 redundant and 17 freely configurable outputs (PNP), 4 safety relay outputs, spring terminal, 24VDC	1.89×10^{-8}	AFSCWH3020
Connecting cable between FP-Safe and FP-series PLC (3-pin COM port), 0.5m	-	CABMODPLC111D
Connecting cable between FP-Safe and FP-series PLC (9-pin COM port), 0.5m	-	CABMODPLC211D
Connecting cable between FP-Safe and FP-series PLC (5-pin mini-DIN), 0.5m	-	AFS8TP
Programming cable for FP-Safe controller, sub-D (9 pin, male), 3m	-	AFS8PG9

Web Datalogger unit

Description	Part number
Web Datalogger unit (DLU), log data of up to 99 devices	AFL1200
IP setting tool, Control Configurator WD	free to download
RS485 cassette pack including DLU, RS485 communication cassette, battery	AFL1200T20
"Eco Starter Pack" including DLU, RS485 Cassette Pack, DLU setting tool, Operation checking tool (KW Watcher), Cables, Manuals	AFL1200T10

Please refer to the FP-Safe brochure for details.

Further Panasonic products

Panasonic Electric Works offers a wide product range from one source, from individual components to complete systems. Technology support for advice, design-in, installation and commissioning by our qualified application engineers round off the Panasonic service profil.

Human Machine Interfaces

Our compact size, bright and easy-to-read Human Machine Interfaces can be used to visualize inspection results. Touch panels can even replace the standard keypad if you so desire.

Servo drives

Panasonic servo drives enable high performance motion control to be applied to almost all types of machines, including chip mounting machines and general industrial machines.

UV curing systems

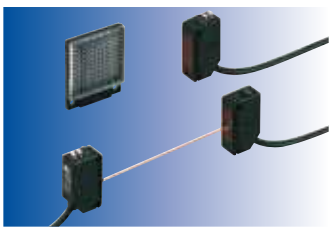
Aicure UJ30 is a LED curing system that quickly hardens UV-sensitive resins such as adhesives, ink and coatings. Its cutting edge LED technology is especially suited for precise, high-intensity curing.

ACD components

Components such as Eco-power meters, timers/counters, temperature controllers, limit switches and fans round off our wide Factory Automation product range.

Machine Vision Systems

Panasonic offers the complete range of high quality industrial Machine Vision systems. From the easy vision sensor to the high-end inspection machine, 100% quality inspection and process control is assured.



Sensors

As a pioneering manufacturer of sensors, Pansonic provides high performance sensors for a wide range of applications, facilitating factory automation in various types of production lines, such as those used for the manufacturing of semiconductors.

Laser Markers

Panasonic laser markers are ideal for non-contact, permanent labelling of most materials, e.g. plastics, glass, paper, wood and leather. Several CO_2 laser marking systems and a unique FAYb laser marker can be easily integrated into existing production systems for a great variety of labelling tasks.

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