Panasonic FP-XH Programmable Controller User Guide

Panasonic

FP-XH Programmable Controller
User Guide

Compact terminal block type controller

Contents

1 Superior performance and great functionality
2 Parts and functions
3 Control FPWIN Pro7
4 Part number list
4.1 Option
5 General specifications
6 Functional specifications
7 Panasonic Electric Works
8 Documents / Resources
8.1 References
9 Related Posts

Superior performance and great functionality

High-speed operation

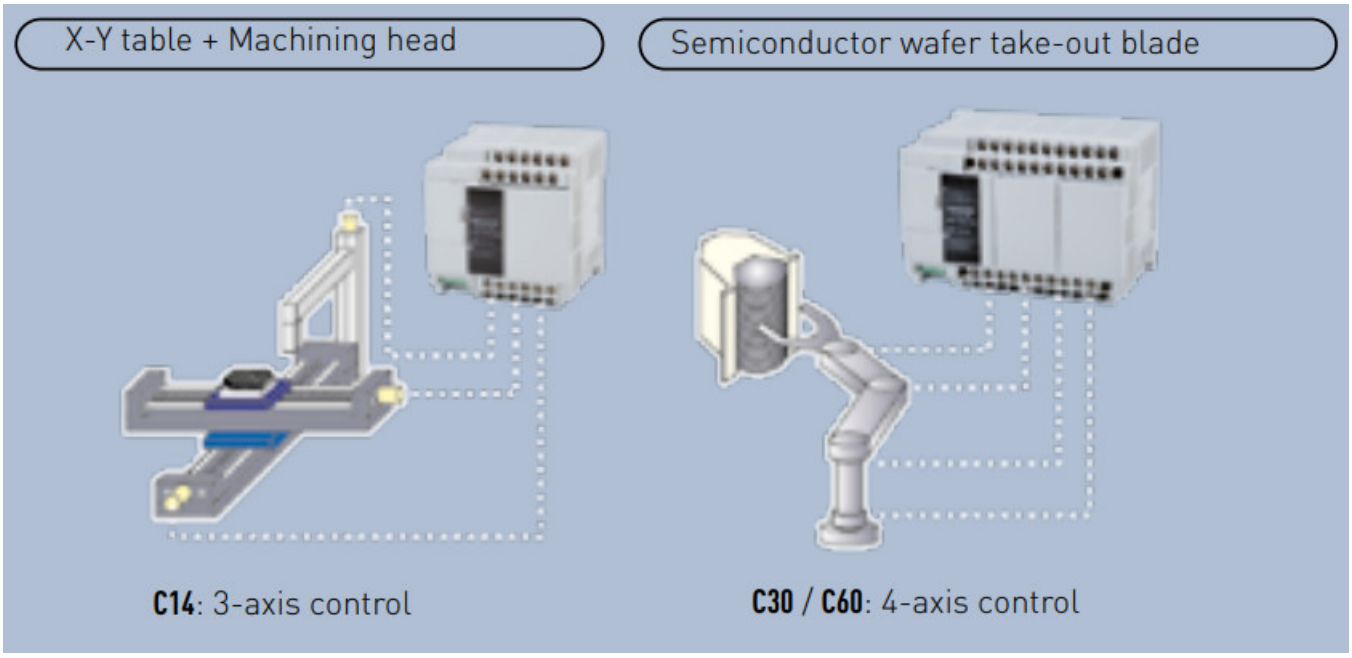
- Basic instructions: 0.04μs/step (up to 7k steps)
- High-level instructions: 0.22μs/step (up to 7k steps)
- 8 x faster than conventional models

Large program capacity

- Up to 40k steps (for C14: 16k steps)
- 24k / 32k / 40k steps (configurable)

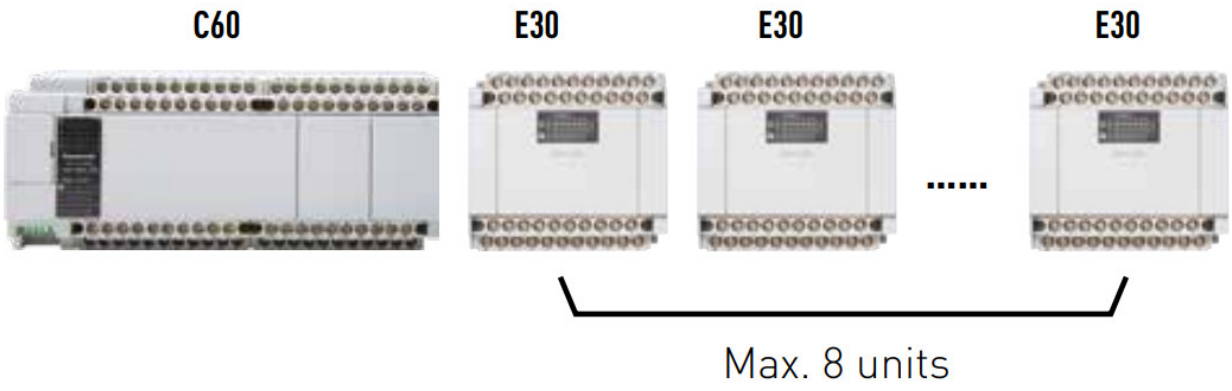
Multi-axis positioning control

- Built-in 100kHz high-speed pulse output function for up to 6 axes
- Transistor output type: built-in pulse output function for 3 axes for C14, 4 axes for C30 and 6 axes for C60



Expandable to 382 inputs/outputs with FP0R expansion units

- One control unit can be expanded with up to 8 expansion units
- Max. number of inputs/outputs: 300 (382 inputs/outputs when using FP0R expansion units and add-on cassettes)
- Up to 4 add-on cassettes can be added (for C30, and C60)

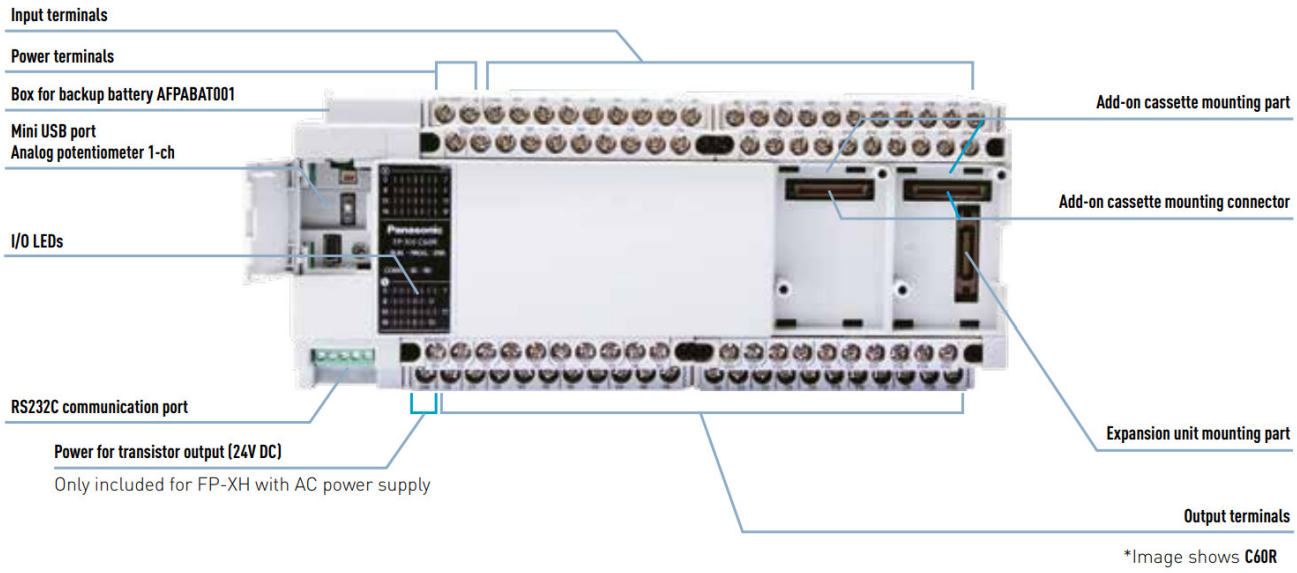


Max. 338
inputs/outputs
382 points when using FP0R expansion units and add-on cassettes

Network

- Communication port: Max. 5 channels Support for up to 5 channels including 2 communication cassettes (2-channel type) and TOOL port.
- Compatible with Modbus-RTU
  Modbus-RTU master/slave functionality
- PLC Link
  Bit data and word data can be shared (linked) via connection with FP-XH (up to 16 units).

Parts and functions



Improved functionality Integrated motion controller No restrictions on combining add-on cassettes	**Expandability** Expandable with up to 8 expansion units Up to 4 add-on cassettes are possible (C30
Full compatibility to FP-X Existing FP-X programs can be reused	**Size** Slightly larger footprint than equivalent FP-X C14: 26mm wider, 3mm deeper C30 / C60: 30mm wider, 3mm deeper

Function comparison table

Comparison		FP-XH	FP-X
Operation speed	Basic instruction	0.04 ps/step (under 7k steps) 0.7 ps/step 17k steps or more)	0.32 ps/step
	High-level instruction	0.22 ps/step (under 7k steps) 1.73 ps/step (7k steps or more)	7.5 ps/step
Program capacity	C14	16k steps	16k steps
	C30 / C60	24k / 32k / 40k steps (depending on system register setting)	32k steps
Pulse output performance	Transistor output type	100kHz x 3 channels/4 channels/6 channels	100kHz x 2 channels + 20kHz x 2 channels
	Relay output type	100kHz x 2 channels (when pulse output cassette is used)	100kHz x 1 channel or 80kHz x 2 channels (when pulse output cassette is used)
High-speed counter performance	Transistor output type	100kHz x 4 channels/6 channels + 10kHz x 4 channels (6-channel pulse output only for 60-point transistor output type)	50kHz x 4 channels + 10kHz x 4 channels
	Relay output type	(Built-in) 10kHz x 8 channels (Pulse output cassette) 100kHz x 4 channels	(Built-in) 10kHz x 8 channels (Pulse output cassette) 50kHz x 4 channels
Communication	Communication port (control unit)	USB x 1 (USB 2.0 compatible) + RS232C x 1	USB x 1 + RS232C x 1 “Round-pin RS232C port
	Communication port (add-on cassette)	Max. 4 channels	Max. 2 channels
Others	Positioning control	Dedicated software + Control by new instructions	Control by high-level instructions
	Analog input / potentiometer input	1 channel	C14 / C30: 2 channels, C60: 4 channels
	Cassette combination restrictions	No	Yes
	Programming software	**Control FPWIN Pro 7**	**Control FPWIN Pro 7**
	Backup battery	**AFPABAT001**	**AFPX-BATT**

Control FPWIN Pro7

Programming software Control FPWIN Pro with PLC open certification

Control FPWIN Pro is the Panasonic programming software developed according to the international standard IEC 61131-3. Control FPWIN Pro is the universal software for all Panasonic PLCs and the ELC500 control unit.

- Programs written in older versions will run with Control FPWIN Pro7.
- Programs are compatible across FP series PLCs, e.g. FP0R programs will run with minor adjustments on FPΣ (Sigma) and FP7 PLCs.
- Control FPWIN Pro7 offers a choice of editors, thus allowing you to select the programming language you are most familiar with.

Part number list

Product name	Power supply	Specification	program capacity	Part number
FP-XH CUR	100 to 240V AC	8-point input of 24V DC, 6-point relay output of 2A	16k steps	AFPXHC14R
FP-XH CURD	24V DC	8-point input of 24V DC, 6-point relay output of 2A	16k steps	AFPXHC14RD AFPXHC14T
FP-XH C14T	100 to 240V AC	8-point input of 24V DC, 0.5 A / 5 to 24V DC, the 6-point output of transistor (NPNI	16k steps	
FP-XH C14.10	24V DC	8-point input of 24V DC, 0.5 A / 5 to 24V DC, the 6-point output of transistor INPNI	16k steps	AFPXHC141D
FP-XH C3OR	100 to 240V AC	16-point input of 24V DC, 14-point relay output of 2A	32k steps	AFPXHCXR
FP-XH C3ORD	24V DC	16-point input of 24V DC, 14-point relay output of 2A	32k steps	AFPXHC3ORD
FP-XH C3OT	100 to 240V AC	16-point input of 24V DC, 0.5 A / 5 to 24V DC, the 14-point output of transistor INPNI	32k steps	AFPXHC3OT
FP-XH C30TD	24V DC	16-point input of 24V DC, 0.5 A / 5 to 24V DC 14-point output of transistor INPNI	32k steps	AFPXHCXED
FP-XH C6OR	100 to 240V AC	32-point input of 24V DC, 28-point relay output of 2A	32k steps	AFPXHC6OR
FP-XH C60RD	24V DC	32-point input of 24V DC, 28-point relay output of 2A	32k steps	AFPXHC6ORD
FP-XH C6OT	100 to 240V AC	32-point input of 24V DC, 0.5A/ 5 to 24V DC 28-point output of transistor (NPNI	32k steps	AFPXHC6OT
FP-XH C60TD	24V DC	32-point input of 24V DC, 0.5A/ 5 to 24V DC, 28-point output of transistor INPNI	32k steps	AFPXHC6010

Product name		Type	Specifications	Part No.
Programming software for Windows® **Control FPWIN Pro7**	English, German, French, Italian, Spanisch	**FP** series all models (for **FP 7** series, supports only CPU unit without encryption function)	Windows® 10 (32-bit / 64-bit) /Windows® 8.1 (32-bit / 64-bit) /Windows® 8 (32-bit / 64-bit) /Windows® 7 SP1 or later (32-bit / 64-bit)	**AFPSPR7A**
	Security enhanced type	**FP** series all models (for **FP 7** series, supports CPUs without encryption function (the encryption function will be offered in the future).		**AFPSPR7AS**

Option

Product name	Specifications	Part No.
FP-XH backup battery	Required when expanding the holding area of the operation memory or when using the clock/calendar function	AFPABAT001

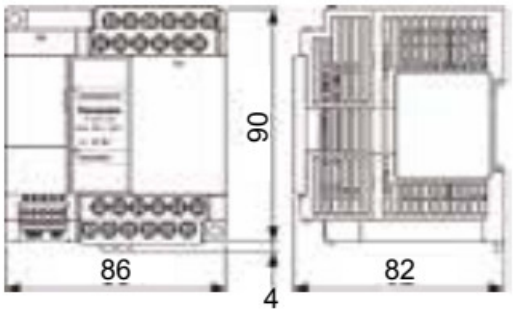
General specifications

Item		Specifications		
Ambient temperature		0 to +55°C		
Storage temperature		-40 to +70°C		
Operating humidity		10 to 95% RH (at +25°C, non-condensing)		
Storage humidity		10 to 95% RH (at +25°C, non-condensing)		
Breakdown voltage (initial value at shipment: cutoff current 5mA)			AC power supply	DC power supply
	Relay output	Between power supply terminal and earth terminal	1500V AC for 1 minute	500V AC for 1 minute
		Between power supply terminal and service power supply terminal	1500V AC for 1 minute	-
		Between input terminal and earth terminal	1500V AC for 1 minute	500V AC for 1 minute
		Between output terminal and earth terminal	1500V AC for 1 minute	1500V AC for 1 minute
	Transistor output	Between power supply terminal and earth terminal	1500V AC for 1 minute	500V AC for 1 minute
		Between power supply terminal and service power supply terminal	1500V AC for 1 minute	-
		Between input terminal and earth terminal	1500V AC for 1 minute	500V AC for 1 minute
		Between output terminal and earth terminal	500V AC for 1 minute	500V AC for 1 minute
Insulation resistance		Between power supply terminal and earth terminal	Min. 100MΩ (500V DC using an insulation resistance meter)	
		Between power supply terminal and service power supply terminal		
		Between input terminal and earth terminal		
		Between output terminal and earth terminal		

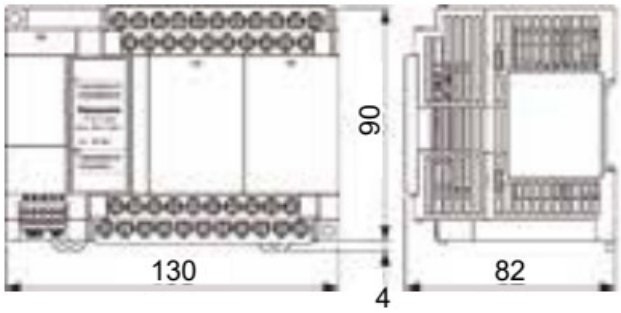
Vibration resistance	5 to 8.4Hz, 3.5mm single amplitude 8.4 to 150Hz, acceleration 9.8m/s^2 10 minutes every X-, Y-, and Z-axis (1 octave/min)
Shock resistance	147m/s^2, 4 times every X-, Y-, and Z-axis
Noise resistance	1,000V [P-P] with pulse widths of 50ns and 1µs (using a noise simulator) (Power supply terminal)
Operation conditions	Free from corrosive gases and excessive dust
CE conformity	EMC directive: EN 61131-2
Overvoltage category	Category II
Pollution degree	2

Dimensions (Unit: mm)

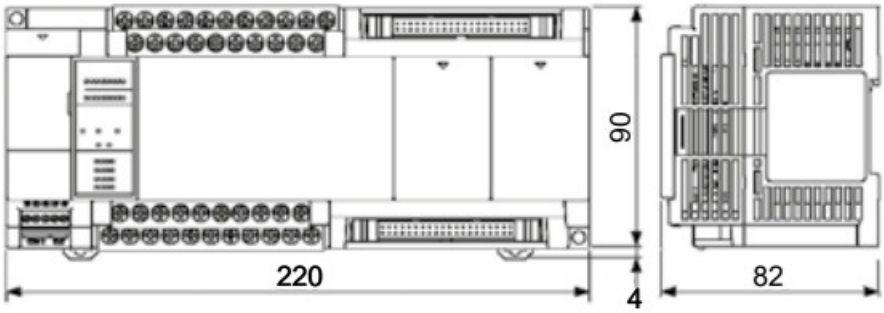
AFPXHC14☐



AFPXHC30☐



AFPXHC60☐



The CAD data can be downloaded from our website.

Functional specifications

Item	Specifications
Control method	Cyclic operation
Program memory	Built-in flash ROM
Program capacity	**C14**: 16k steps, **C30** / **C60**: 24k / 32k / 40k steps (depending on system register setting)
Basic instructions	Approx. 110
High-level instructions	Approx. 220
Operation speed	Basic instruction (ST): Approx. 0.04µs/step (under 7k steps) Approx. 0.7µs/step (7k steps or more) High-level instruction: Approx. 0.22µs/step (under

			7k steps) Approx. 1.73μs/step (7k steps or more)
Operation memory	Link relay	External input (X)	1760 points (X0 to X109F)
		External output (Y)	1760 points (Y0 to Y109F)
		Internal relay (R)	Default: 8192 points (R0 to R511F) **FP-X** compatible specifications: 4096 points
		Special internal relay (R)	240 points
		Timer / Counter (T / C)	1024 points (initial setting: timer 1008 points, counter 16 points)
		Link relay (L)	2048 points (L0 to L127F)
	Memory area	Data register (DT)	**C14**: 12k words, **C30** / **C60**: 64k, 32k, 12k words *For **C30** / **C60**, DT capacity varies according to the program capacity
		Special data register DT)	500 words
		Link data register (LD)	256 words (LD0 to LD255)
		File register (FL)	None
		Index register (I)	14 words (I0 to ID)
Master control relay points (MCR)			256 points
Number of labels (JMP + LOOP)			256 points
Number of SFC steps			1000 steps
Number of subroutines			500 subroutines
Number of interrupt program			Transistor output type: input 8, constant 1 Relay output type: input 11 (for **C30** / **C60**: 14), constant 1
High-speed counter	CPU input		Transistor output type: Single-phase 8 channels (100kHz × 4, 10kHz × 4) or 2-phase 4 channels (50kHz × 2, 10kHz × 2) Relay output type: Single-phase 8 channels (10kHz × 8) or 2-phase 4 channels (10kHz × 4)
	Pulse I/O with cassette installed		Transistor output type: installation not possible Relay output type: **C14**: Single-phase 2 channels (100kHz × 2) or 2-phase 1 channel (50 Hz × 1) **C30** / **C60**: Single-phase 4 channels (100kHz × 4) or 2-phase 2 channels (50kHz × 2) *with two cassettes installed
tput / PWM output	Control unit output		Transistor output type: **C14**: 3 channels, **C30**: 4 channels, **C60**: 6 channels Pulse output: each 100kHz PWM output: 3 channels (**C14**), 4 channels (other than **C14**) 1Hz to 70kHz (Resolution of 1000) 70.001kHz to 100kHz (Resolution of 100)
			Relay output type: C14: 1 channel, C30 / C60: 2 channels (with two

Pulse out	Pulse I/O with cassette installed	**C14**: 1 channel, **C30** / **C60**: 2 channels (with two cassettes installed) Pulse output: each 100kHz PWM output: 1 channel (**C14**), 2 channels (other than **C14**) (with two cassettes installed) 1Hz to 70kHz (resolution of 1000) 70.001kHz to 100kHz (resolution of 100)
Pulse catch input Interrupt input		Transistor output type: 8 points (CPU input: 8 points) Relay output type: 14 points (CPU input: 8 points, pulse I/O cassette: 3 points × 2)
Periodical interrupt		0.1ms to 30s
Potentiometer input		1 channel (0 to 4000)
Input time constant processing		Available
Clock / calendar		Available (only when the master memory cassette **AFPX-MRTC** and battery are installed)
Automatic flash ROM backup when power is off		Counter: 16 points, internal relay: 128 points, data register: 315 words
Battery backup		Memory set in hold area of system register (only when battery is installed)
Battery lifetime		Min. 5 years when operating 8 hours a day (depending on conditions of use)
Password		Yes (4 digits, 8 digits or 32 digits)
Self-diagnostic function		Watchdog timer, program syntax check, etc.
PLC link function		Max. 16 units, link flag: 1024 points, link register: 128 words (data transfer, no remote programming)
Rewriting in RUN mode		Max. 512 steps (downloading in RUN mode, program rewriting in RUN mode)

Global Network

Panasonic Electric Works

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Documents / Resources

	Panasonic FP-XH Programmable Controller [pdf] User Guide FPXH Series, FP-XH, FP-X, FPXH Series, Programmable Controller, FP-XH Programmable Co ntroller

References

- Panasonic Industry Europe GmbH | Industry Sector Partner

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