

Panasonic

NEW

Programmable Controller

FP7 SERIES

CE
Conforming to
EMC Directive
(except AFPRP2□)



Seven Steps to Higher Efficiency

All about efficiencies for your manufacturing

FP7 features

Local & remote connectivity

Dedicated to the total integration into Web applications

Security & reliability

Provides different security levels according to customer needs, automatically stores backup programs and allows users to update programs only after a functional check

Compact design

Incorporates the functionality and performance of a modular PLC in an outstanding compact format

Traceability

Traces the values of variables over a certain time frame during program execution

FP7: Seven steps to higher efficiency



4

Maintenance

Integrates several features that facilitate maintenance, diagnostics and troubleshooting

5

Advanced motion control (cam & gear)

Offers a variety of control options, from simple position control to synchronized control of multiple axes to advanced cam control and gearing

6

Performance

Equipped with a large memory capacity (up to 234 k program steps or up to 976 k data words) and a high-speed processor (11 ns/step)

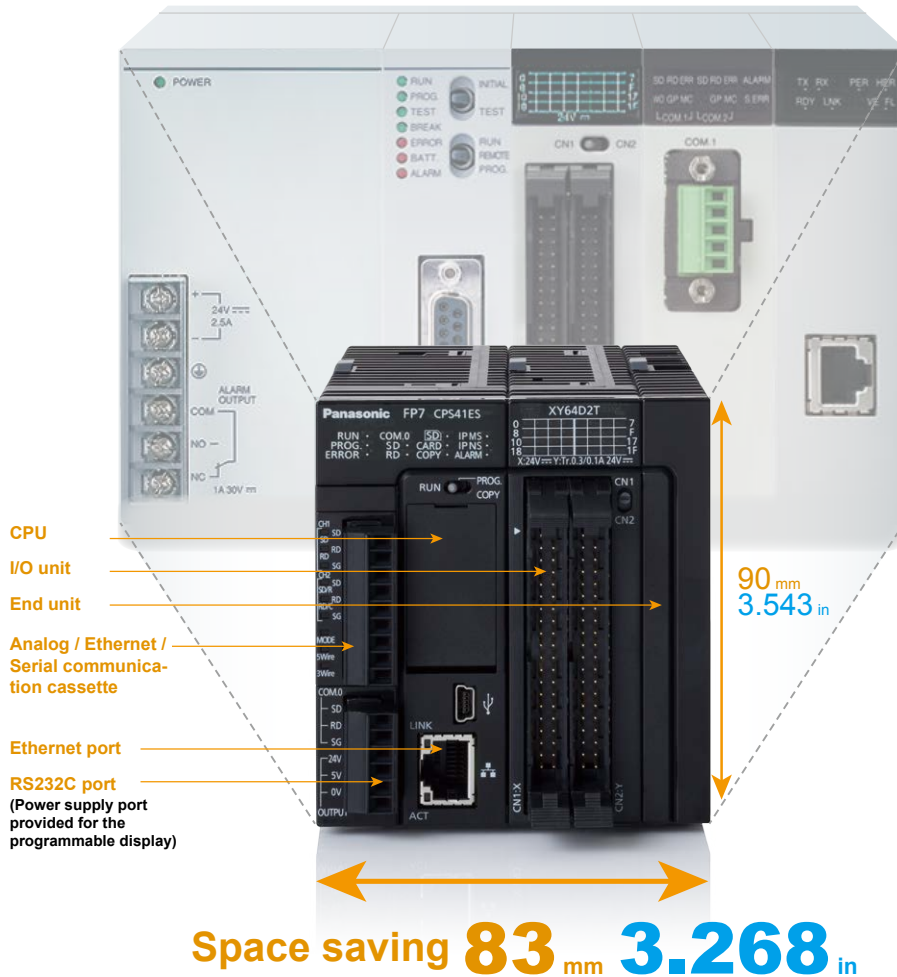
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Compact design

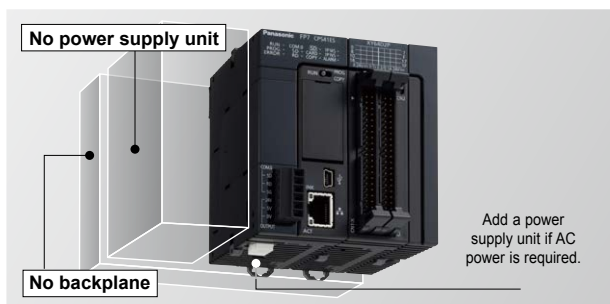
The FP7 represents the top of the range of our PLCs and incorporates all the functionality and performance of a modular PLC in an outstanding compact format with a height of only 90 mm **3.543 in**!



No power supply unit needed

No power supply unit is needed if the CPU is directly connected to DC power. Expansion units are clipped together without backplane.

- Reduced costs
- Smaller footprint



No communication unit needed

Enhancing communication features can be added using communication cassettes.

- Reduced costs
- Smaller footprint

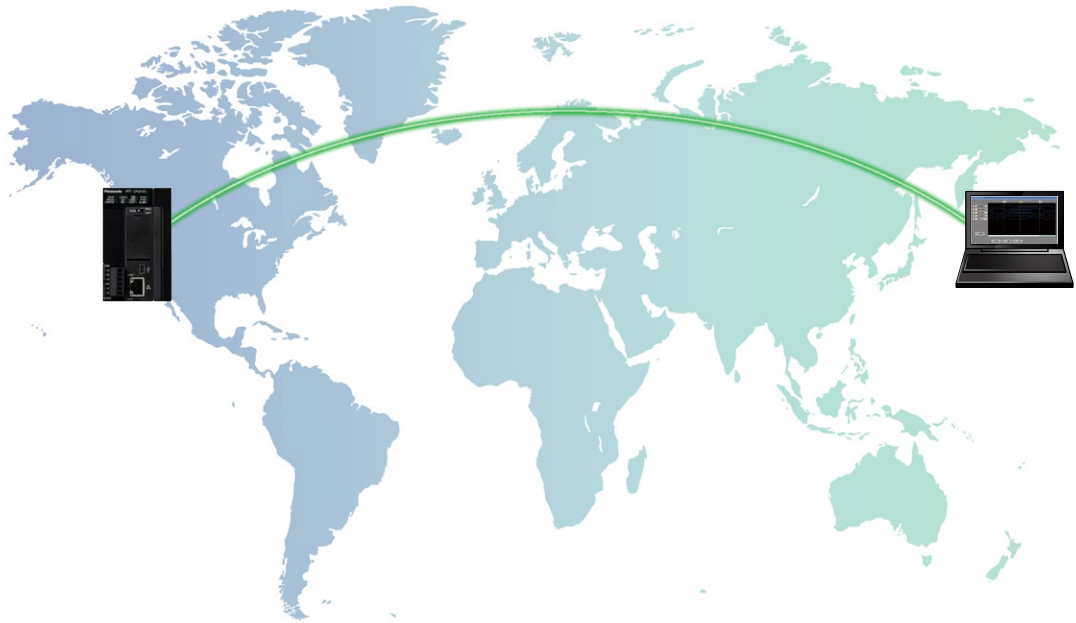




Local & remote connectivity

The FP7 is dedicated to the total integration into Web applications. The standard CPU boards with Ethernet interface offer connectivity without limits, from remote programming to monitoring and data logging to FTP server and Modbus TCP.

Data load to SD memory card from remote place



Logging function to SD memory card
Transfer function through Ethernet



- **Collection of traceability information**
- **Accessible from remote locations**
- **No logger unit offers lower costs.**



Data logging possible

- Constant-frequency logging
- Event trigger logging (instruction trigger type, bit-specific type)

FTP server



Graphs can be created using spreadsheet software.

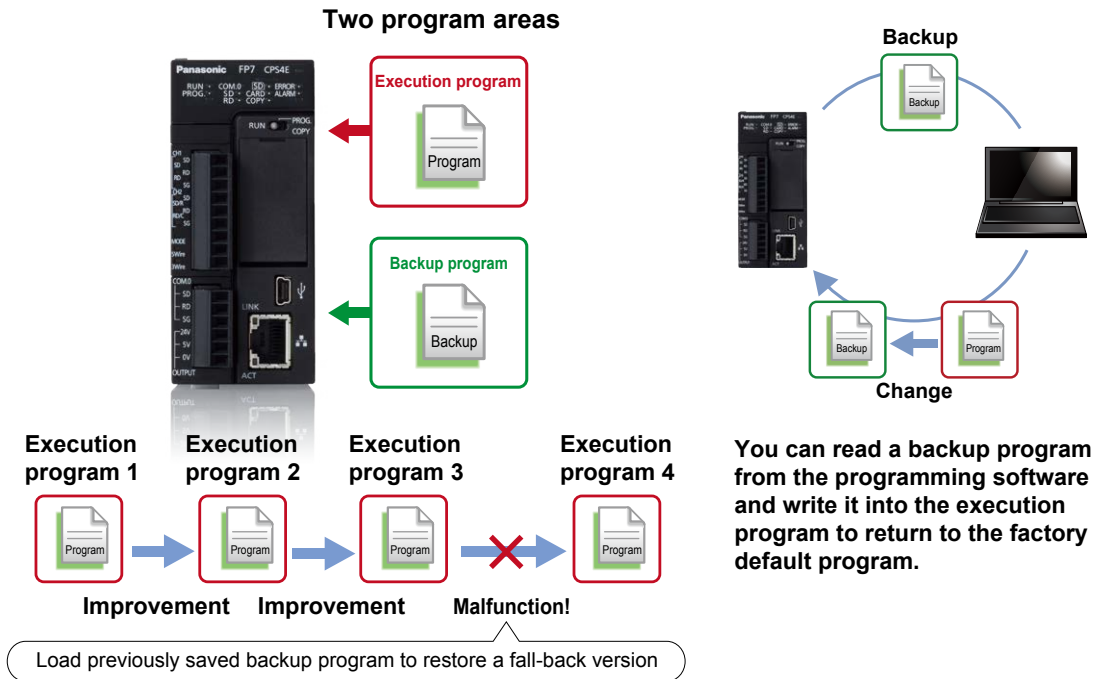


Security & reliability

The PLC programs can be password protected. Additionally, different security levels can be set, according to customer needs. The CPU unit can store two programs. In the event of fault, no SD memory card is needed to return to a previously saved backup program.

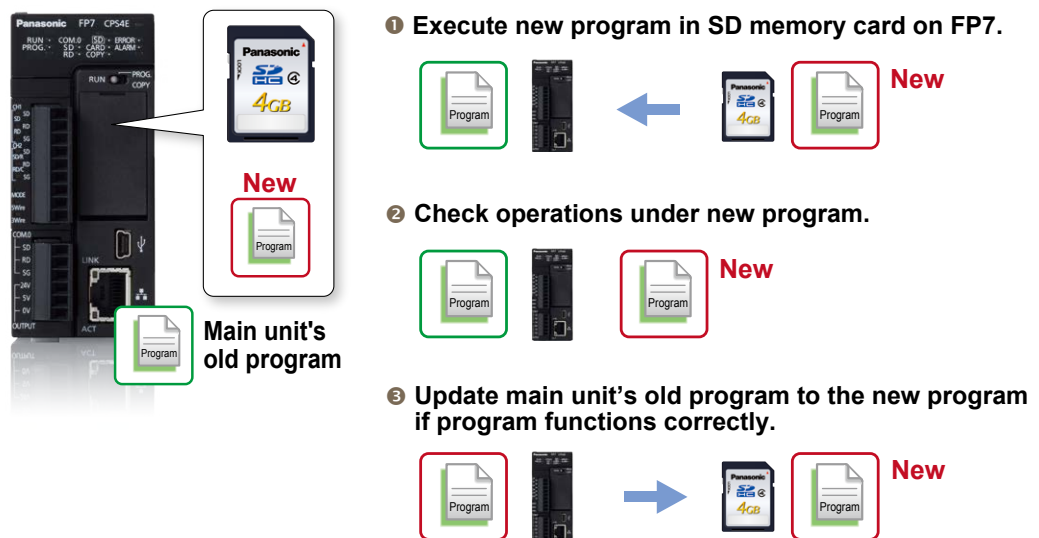
Built-in program backup

- Production can resume in the event of fault
- Original program is immediately to hand



Update PLC program only after functional check

- Operation can be tested on SD memory card



4

Traceability

Operational and program editing events are logged. Automatic logs of program download and upload are useful, especially for program debugging.

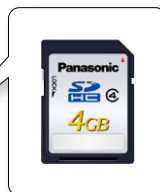
Automatic recording of program change history

- Useful for debugging



* Image

Date of occurrence	Time	Trigger
2012/11/21	14:05:35	Power: ON
2012/11/21	14:07:13	Open cover
2012/11/21	14:20:25	Insert SD memory card.
2012/11/21	14:30:19	Close cover
2012/11/21	14:31:00	Download program
2012/11/21	14:33:10	Switch operation mode to RUN
2012/11/21	14:35:12	Program edition during RUN
2012/11/21	14:35:32	Upload program
2012/11/21	14:40:07	Power: OFF



The log data stored on SD memory card.

- Collection of traceability information
- No logger unit offers lower costs.

5

Maintenance

The FP7 integrates several features that facilitate maintenance, diagnostics and troubleshooting. Set a maintenance schedule that is based on automatic measurement of contact switching cycles or overall ON time.

Hour meter operation

- Indication of maintenance schedule for peripheral equipment
- Indication of maintenance schedule for the PLC itself



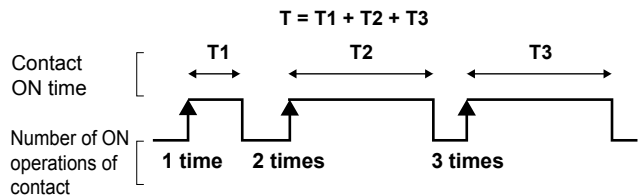
Monitor input and output contact states.
Power-on time \neq Equipment operating time

Input contacts (X)

Automatically measures and logs total ON times and number of ON operations of connected sensors.

Output contacts (Y)

Automatically measures and logs total ON times and number of ON operations of connected actuators. The maintenance schedules for relays, motors, etc. can be optimized.

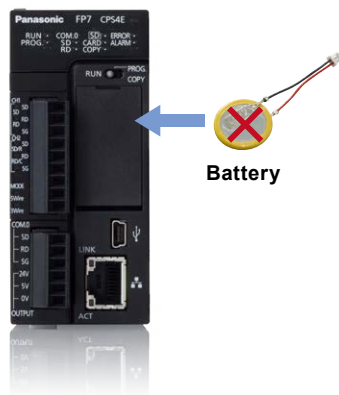


Records the PLC's ON time

Equipment operating time can be estimated. You can decide which equipment to give priority to reactivate if more than one item of equipment is idle.

Data backup without battery

- Simplified maintenance of equipment



Item	Without battery	With battery
Program holding	Yes	Yes
Data register holding	Yes	Yes
Clock/calendar operation	No (Note 1)	Yes

Note: 1) Clock / calendar operation can be held for about a week if the equipment is switched off. (Allow at least 30 minutes of equipment ON time.)

The built-in clock/calendar function can be adjusted via Ethernet.

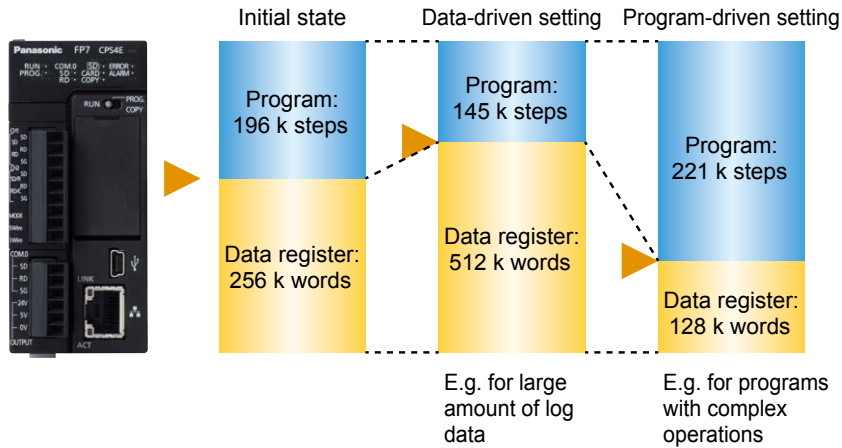


Performance

The FP7 has a large memory capacity for program and data (up to 234 k program steps or up to 976 k data words) and a high-speed processor (11 ns/step). Control FPWIN Pro is (up-and downward) compatible with all Panasonic PLCs.

Shareable program and data memory

- Both expandable when more capacity needed
- No need to purchase upgrade models



AFP7CPS41E

Reference value: for 196 k steps type CPU unit

Program	Data register
234 k steps approx.	64 k words approx.
221 k steps approx.	128 k words approx.
196 k steps approx.	256 k words approx.
145 k steps approx.	512 k words approx.
52 k steps approx.	976 k words approx.

Note: For data register (DT), data up to 256 k words can be backed up.

AFP7CPS31E / AFP7CPS31

Program	Data register
120 k steps approx.	128 k words approx.
96 k steps approx.	256 k words approx.
64 k steps approx.	416 k words approx.
32 k steps approx.	576 k words approx.



New analog units with high-speed DA and AD conversion

- Conversion speed 20 times faster than in previous models
- High-accuracy control
- Noise-resistant with isolated channels



Advanced motion control (cam & gear)

FP7 programmable controllers are perfectly integrated with MINAS A5 servo drivers for accurate and sophisticated control in applications with up to 64 axes.

Besides, it is possible to set linear or sinusoidal acceleration and deceleration; startup/stop and speed changes are easy to accomplish in applications with high inertia loads.

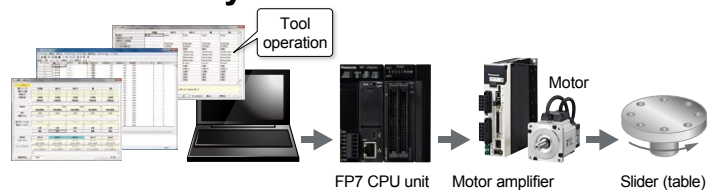
FP7 positioning units can handle complex motion control tasks, e.g.

- Position and speed control
- Electronic cam control
- Axis synchronization operations (gear and clutch functions)
- Linear, circular and spiral interpolation (2/3 axes)



Positioning can be tested with only the tool.

Since the positioning tool is independent of the ladder program, trial operation and debugging is possible using only the positioning unit.



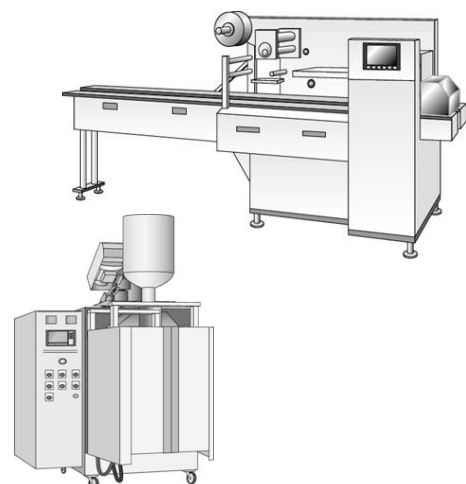
Electronic cam control

Electronic cam control allows fast and precise movements and increases the productivity and dynamics in all non-linear movements. Using a configurator software, it is possible to create advanced motion profiles quickly and easily. The tool offers the possibility to insert electronic cam profiles for master and slave axes. Up to 16 cam profiles per slave axis and 20 different sections per master axis can be managed. The master axis can be either a physical or a virtual axis as well as an external encoder.

You can even manage complex movements in processes where you have to work on moving material without interruption, e.g. in wood, textile, plastic or paper applications with flying saws.

Typical applications

- Wrapping and packaging machines
- Bottling machines
- Binding machines
- Pick and place
- Assembly machines
- Molding and sealing machines
- Machines for binding
- Wood and metal machines
- Textile machines
- Cutting, welding, sawing



FP7 series Lineup

CPU units

▶ P.12

Standard model



196 k steps
with Ethernet
AFP7CPS41E



120 k steps
with Ethernet
AFP7CPS31E



120 k steps
AFP7CPS31

End unit



*Included with CPU unit

Standard model
Security enhanced
type



196 k steps
with Ethernet
AFP7CPS41ES



120 k steps
with Ethernet
AFP7CPS31ES



120 k steps
AFP7CPS31S

Add-on cassettes

▶ P.13, 14

Communication cassettes



RS232C
1 channel
AFP7CCS1



RS232C
2 channels
AFP7CCS2



RS422 / RS485
1 channel
AFP7CCM1



RS422 / RS485
2 channels
AFP7CCM2



RS232C 1 channel
and RS485 1 channel
AFP7CCS1M1



Ethernet
1 channel
AFP7CCET1

Function cassettes



Analog input
AFP7FCAD2



Analog input
and output
AFP7FCA21



Thermocouple input
AFP7FCTC2

Power supply units

▶ P.22

AC power supply units



AC power supply unit
AFP7PSA1



AC power supply unit
(High-capacity type)
AFP7PSA2

Digital input and output units

▶ P.15

Input units



Terminal block
16 points, 12 to 24 V
DC input
AFP7X16DW



MIL connector
32 points, 24 V
DC input
AFP7X32D2



MIL connector
64 points, 24 V
DC input
AFP7X64D2

Output units



Terminal block
16 points,
relay output
AFP7Y16R



Terminal block
16 points,
transistor output
(sink)
AFP7Y16T



MIL connector
32 points,
transistor output
(sink)
AFP7Y32T



MIL connector
64 points,
transistor output
(sink)
AFP7Y64T



Terminal block
16 points,
transistor output
(source)
AFP7Y16P

Output units



MIL connector
32 points,
transistor output
(source)
AFP7Y32P



MIL connector
64 points,
transistor output
(source)
AFP7Y64P

Input and output units



MIL connector
32 points, 24 V DC input
32 points, transistor output
(sink)
AFP7XY64D2T



MIL connector
32 points, 24 V DC input
32 points, transistor output
(source)
AFP7XY64D2P

Analog input and output units

▶ P.18

Input unit



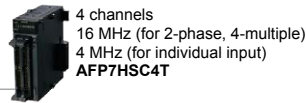
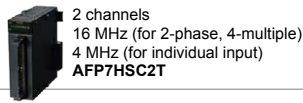
High-speed and high-accuracy type
4 points, voltage and current
AFP7AD4H

Output unit



High-speed and high-accuracy type
4 points, voltage and current
AFP7DA4H

High-speed counter units
▶ P.19



Positioning units
▶ P.20

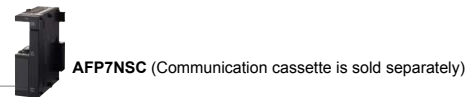
Pulse train



Pulse output units
▶ P.21



Serial communication unit
▶ P.22

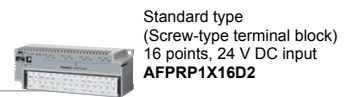
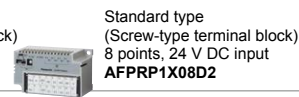
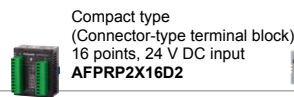
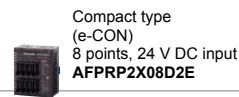


PHLS (remote I/O) units
▶ P.23

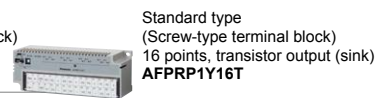
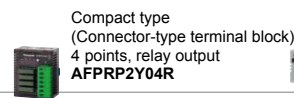
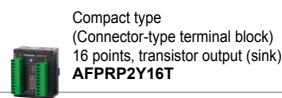
PHLS master unit



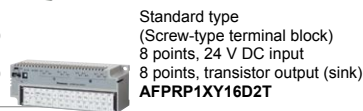
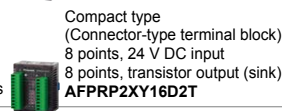
PHLS slave units
Input type



PHLS slave units
Output type



PHLS slave units
Input and output types



Note: Compact type **AFPRP2**□ is not conforming to EMC Directive.

CPU units

Basic performance

- Operation speed: Min. 11 ns/step
- Program capacity: 196 k steps
- Data registers: 256 k words
- Number of unit connection: Max. 16 units

Compact size with room for expansion functions



• Equipped with a cassette interface.

Add-on cassettes can be added to the CPU to increase functionality without increasing the width of the unit. Communication cassettes support RS232C, RS422 and RS485 serial communications.

• Up to 16 different units can be connected to a single CPU

• High-capacity SD (SDHC) memory cards of up to 32 GB are supported.

• High performance (min. scan time 1ms, max. 20 μs for 60 k steps); the processing speed is less susceptible to frequent Ethernet communication

• GT power supply terminals for connecting 5 V or 24 V DC type GT series programmable displays

• High function types, increased security (encryption), are available.

Performance specifications

Item		AFP7CPS41E(S) (Note 6)				
Memory capacity	Memory selection pattern (Note 1)	1	2	3	4	5
	Program (steps)	234,000	221,500	196,000	144,500	51,500
	Data register (words) (Note 2)	65,536	101,072	262,144	524,288	999,424
	Number of max. program block (PB)	468	443	392	289	103
Item		AFP7CPS31E(S) / AFP7CPS31(S) (Note 6)				
Memory capacity	Memory selection pattern (Note 1)	1	2	3	4	
	Program (steps)	121,500	96,000	64,000	32,000	
	Data register (words) (Note 2)	131,072	262,144	425,984	589,824	
	Number of max. program block (PB)	243	192	128	64	
Item		AFP7CPS41E(S) / AFP7CPS31E(S) / AFP7CPS31(S) (Note 6)				
Programming method		Relay symbol method				
Control method		Cyclic operation method				
Program memory		Built-in flash ROM (no backup battery required)				
Operation speed		Basic instruction: min. 11 ns/step				
External input (X)/output (Y)		8,192 points (Note 3) / 8,192 points (Note 3)				
Internal relays (R)		32,768 points				
System relays (SR)		Indicate operation status of various relays is shown.				
Link relays (L)		16,384 points				
Timers (T)		4,096 points: Timer capable of counting (units: 10 μs, 1 ms, 10 ms, 100 ms or 1 sec.) × 4,294,967,295				
Counters (C)		1,024 points. Counter capable of counting 1 to 4,294,967,295				
Link data registers (LD)		16,384 words				
System data registers (SD)		Internal operation status of various registers is shown.				
Index registers (I0 to IE)		15 long words				
Master control relay (MCR)		Unlimited				
Number of labels (LOOP)		Max. 65,535 points for each program block (PB)				
Differential points		Unlimited				
Number of step ladders		Unlimited				
Number of subroutines		Max. 65,535 points for each program block (PB)				
Number of interrupt programs		1 periodical interrupt program				
SD memory card function		SDHC memory cards of up to 32 GB are usable.				
Constant scan		Available (0 to 125 ms)				
Real time clock (Note 4)		Built in. Date backup with battery.				
Battery life (Value applies when no power is supplied at all.)		3.3 years or more (when no power is supplied) actual usage value: 20 years approx. (at 25 °C 77 °F)				
Safety function (Note 5)		Password / Read disable setting / Encryption (every PB)				
PLC Link function		Max. 16 units, link relays: 1,024 points, link registers: 128 words. (Data transfer and remote programming are not supported)				

- Notes 1) The factory default setting is pattern 3 for AFP7CPS41E(S) and pattern 1 for AFP7CPS31E(S) and AFP7CPS31(S).
 2) For data register (DT), data up to 262,144 words can be backed up.
 3) Hardware configuration governs the actually usable number of I/O points. When I/O points are not actually used, usable as internal relays
 4) Precision of calendar: At 0 °C 32 °F, less than 95 seconds error per month, At 25 °C 77 °F, less than 15 seconds error per month, At 55 °C 131 °F, less than 130 seconds error per month
 5) Encryption can be used for AFP7CPS41E(S), AFP7CPS31E(S) and AFP7CPS31(S).
 6) Products with an "S" at the end of a part number have the encryption function.

COM port communication specifications

Item	Specifications
Interface	RS232C, 1 channel
Transmission distance	15 m 49 ft
Transmission speed	300,600,1200,2400,4800,9600,19200,38400, 57600,115200,230400 bits/sec.
Communication method/ Synchronous method	Half-duplex system / Start-stop synchronization system
Transmission format	Stop bit: 1 bit / 2 bits
	Parity: none / odd / even
	Data length: 7 bits / 8 bits
	Start code: with STX / without STX
Data transmission order	End code: CR / CR + LF / none / ETX
	Transmit from bit 0 in character units.
Communication mode	General-purpose communication, Computer link and MODBUS-RTU

Dedicated power supply output port specifications for GT series programmable display

Terminal	Connecting Programmable Display model
5 V	For 5 V DC type GT series Programmable Display
24 V	For 24 V DC type GT series Programmable Display

Note: 5 V and 24 V DC types are not usable at the same time.

LAN port communication specifications [without AFP7CPS31(S)]

Item	Specifications
Communication interface	Ethernet 100BASE-TX / 10BASE-TX
Baud rate	100 Mbps, 10 Mbps auto negotiation function
Total cable length	100 m 328 ft (500 m 1,640 ft when a repeater is used)
Number of nodes	Max. 254 units
Number of simultaneous connections	Max. 20 connections (user connection: 16, system connection: 4)
Communication protocol (Communication layer)	TCP / IP, UDP
DNS	Supports name servers
DHCP / DHCPV6	Automatic IP address acquisition
FTP server	File transfer, server function, number of user: 3
SNTP	Time adjustment function
General-purpose communication	16 kB / 1 connection
Dedicated communication	Slave communication (MEWTOCOL-COM,MEWTOCOL7-COM, MEWTOCOL-DAT,MODBUS-TCP)
	Master communication (MEWTOCOL-COM,MEWTOCOL-DAT, MODBUS-TCP)

Add-on cassettes (communication cassettes)

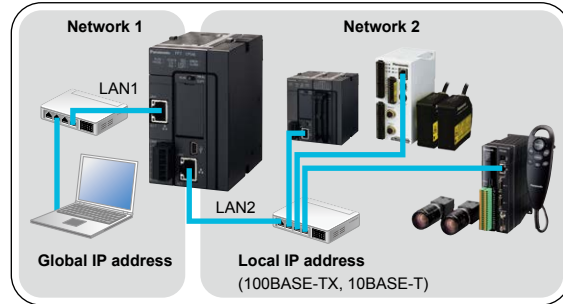
For communication with programmable displays or PCs and for data exchange between PLCs



• **Serial communication functions can be added to the CPU.**

6 types are available including RS232C dedicated cassettes, cassettes to support either RS422 or RS485 or Ethernet, and cassettes that support any combination of RS232C and RS485.

[Configuration example]



• **Protocol supports MODBUS-RTU.**

Communication can easily be accomplished using comfortable communication instructions.

Specifications

Item	AFP7CCS1	AFP7CCS2 (Note 6)	AFP7CCM1 (Note 5)	AFP7CCM2 (Note 5)	AFP7CCS1M1
Interface	RS232C, 1 channel	RS232C, 2 channels	RS422 or RS485, 1 channel	RS422 or RS485, 2 channels	RS232C, 1 channel and RS485, 1 channel
Transmission distance	Max. 15 m 49 ft (Note 1)		Max. 1,200 m 3,937 ft at RS485 mode (Note 2 and 3) Max. 400 m 1,312 ft at RS422 mode (Note 2 and 3)		Max. 15 m 49 ft (RS232C) (Note 1) Max. 1,200 m 3,937 ft (RS485) (Note 2 and 3)
Transmission speed	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400 bits/sec.				
Communication method	Half-duplex				
Synchronous method	Start-stop synchronization				
Transmission format	Stop bit: 1 bit / 2 bits				
	Parity: none / odd / even				
	Data length: 7 bits / 8 bits				
	Start code: with STX / without STX				
Data transmission order	End code: CR / CR + LF / none / ETX Transmit from bit 0 in character units.				
Max. number of stations (Note 2, 3 and 4)	-	-	For program controlled communication: max. 99 (Note 7) For MEWTOCOL COM: max. 99 (Note 7) For PLC link: max. 16 (Note 7) For MODBUS-RTU: max. 99 (Note 7)		For program controlled communication: max. 99 For MEWTOCOL COM: max. 99 For PLC link: max. 16 For MODBUS-RTU: max. 99

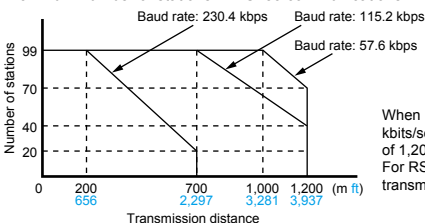
When connecting a commercially available device that has an RS485 / RS422 interface, please confirm operation using the actual device. In some cases, the number of station units, transmission distance and communication speed vary depending on the connected device.

Notes: 1) Cable length should be no longer than 3 m 9.8 ft if communicating at a rate of 38.4 kbits/sec. or higher.

If you are using RS232C wiring, shielded cable should be used to improve noise immunity.

2) For RS485 setting, the values for transmission distance, transmission speed and number of connected units should be within the values noted in the graph below.

Maximum number of stations in RS485 communications



When using a transmission speed of 38.4 kbits/sec. or less, you can set up a maximum of 1,200 m 3,937 ft and 99 units. For RS422 setting, you can set up a maximum transmission distance of 400 m 1,312 ft.

3) If mixed C-NET adapters are used, up to 32 units can be connected, but transmission speed will be limited to a maximum of 19.2 kbits/sec..

4) The converter SI-35 manufactured by LINE EYE Co., Ltd. is recommendable for the RS485 at the computer side.

When you use the SI-35, please adjust time after FP7 series PLC receives a command until it returns a response by a program.

5) RS422 or RS485 can be selected using the DIP switch built into the communication cassette.

6) Using the DIP switch built into the communication cassette allows the interface to be used as RS232C 5-wire system × 1 channel.

7) 1:1 for RS422 interface

Item	AFP7CCET1
Interface	Ethernet 100BASE-TX / 10BASE-TX
Communication speed	100 Mbps, 10 Mbps Auto negotiation function
Total cable length	100 m 328.084 ft (500 m 1,640.420 ft when a repeater is used)
Number of nodes	Max. 254 units
Number of simultaneous connections	Max. 4 connections (User connection: 3, System connection: 1)
Communication protocol (Communication layer)	TCP / IP, UDP
DHCP	Automatic IP address acquisition
General-purpose communication	4 kB / 1 connection
Dedicated communication	Slave communication (MEWTOCOL-COM, MEWTOCOL7-COM, MEWTOCOL-DAT)
	Master communication (MEWTOCOL-COM, MEWTOCOL7-COM, MEWTOCOL-DAT)

Notes: 1) Please connect the Ethernet cable with the power turned off.

2) You cannot use this cassette "AFP7CCET1" with the serial communication unit.

Add-on cassettes (function cassettes)

Add Analog I/O, temperature input function



- Analog I/O and temperature input functions can be added to the CPU unit.

Low cost expansion of the CPU unit with an analog function is easy and installation space can be reduced.



Analog cassette

- Analog input (2 channels)
- Analog input and output (input: 2 channels, output: 1 channel)
- Thermocouple (2 channels)

- **Low cost addition of functions**

Reduced cost and space are realized compared to the analog input and output unit.

ANALOG INPUT CASSETTE / ANALOG INPUT AND OUTPUT CASSETTE

Input specifications

Item		AFP7FCAD2 / AFP7FCA21	
Input specifications	Number of input points	2 channels (non-insulated between channels)	
	Input range	Voltage	0 to 10 V / 0 to 5 V *Switch setting (individual settings possible)
		Current	0 to 20 mA
	Digital conversion value	K0 to K4000	
	Resolution	1/4000 (12 bits)	
	Conversion speed	1 ms / channel	
	Overall precision	±1 % F.S. or less (0 to 55 °C 32 to 131 °F)	
	Input impedance	Voltage	1 MΩ
		Current	250 Ω
	Absolute maximum input	Voltage	-0.5 V, +15 V
Current		+30 mA	
Insulation method		<ul style="list-style-type: none"> • Between analog input terminal and internal digital circuit: transformer insulation, isolation IC insulation • Between analog input terminal and analog output terminal: transformer insulation, isolation IC insulation 	
Connection method		Connector type terminal block	

Note: Input specifications of the analog I/O cassette and analog input cassette are the same.

THERMOCOUPLE CASSETTE

Specifications

Item		AFP7FCTC2
Number of input points		2 channels (insulated between channels)
Input range*	K type thermocouple	-50.0 to 500.0 °C -58.0 to 932.0 °F
	J type thermocouple	-50.0 to 500.0 °C -58.0 to 932.0 °F
Digital conversion value	Normal time	K-500 to K5000
	When range over	K-501, K5001 or K8000
	When the thermocouple broken	K8000
	When data preparation	K8001
Resolution		0.2 °C 32.36 °F (Display is 0.1 °C 32.18 °F with the software averaging process.)
Sampling cycle		100 ms / 2 channels
Overall precision		±0.5 % F.S. or less and cold contact accuracy: 1.5 °C 34.7 °F (0 to 55 °C 32 to 131 °F)
Input impedance		344 KΩ
Insulation method		<ul style="list-style-type: none"> • Between thermocouple input terminal and internal digital circuit: transformer insulation, isolation IC insulation • Between thermocouples: transformer insulation, isolation IC insulation
Connection method		Connector type terminal block

Note: Thermocouple setting can be switched with the switch on the front of the cassette.

ANALOG INPUT AND OUTPUT CASSETTE

Output specifications

Item		AFP7FCA21	
Output specifications	Number of output points	1 channel	
	Output range	Voltage	0 to 10 V / 0 to 5 V *Switch setting
		Current	0 to 20 mA
	Digital conversion value		K0 to K4000
	Resolution		1/4000 (12 bits)
	Conversion speed		1 ms / channel
	Overall precision		±1 % F.S. or less (0 to 55 °C 32 to 131 °F)
	Output impedance		0.5 Ω (voltage output)
	Max. output current		10 mA (voltage output)
	Absolute output load resistance		600 Ω or less (current output)
Insulation method		<ul style="list-style-type: none"> • Between analog input terminal and internal digital circuit: transformer insulation, isolation IC insulation • Between analog input terminal and analog output terminal: transformer insulation, isolation IC insulation 	
Connection method		Connector type terminal block	

Note: There is no analog output functionality in the analog input cassette.

Digital input and output units



* Photograph shows typical models for each shape.

I/O points can be added as necessary.

• Input/output mixed units are available.

A single I/O mixed unit has 32 input points and 32 output points. The necessary I/O points can be efficiently obtained, resulting in a compact PLC at reduced cost. Dedicated input or output units are also available.

• Transistor output unit is designed for 300 mA current capacity.

The 64 points transistor output unit is equipped with 8 contact points with 300 mA current capacity. Large indicator lamps, magnetic contacts, etc. that previously required relay outputs or external relays can be driven directly. Equipment can be made both more compact and cheaper.



• Input time constants are configurable.

Response speed can be selected from 0.1 ms, 0.5 ms, 1 ms, 5 ms, 10 ms, 20 ms or 70 ms, depending on the output equipment to be used.



Input/output specifications

Item	DC input units			I/O mixed unit (input side)
	16 points type	32 points type	64 points type	DC input / sink output type
Insulation method	Photocoupler			DC input / sink output type
Rated input voltage	12 to 24 V DC	24 V DC		24 V DC
Rated input current	6 mA approx. (at 24 V)	2.7 mA		2.7 mA
Impedance	3.6 kΩ	8.2 kΩ		8.2 kΩ
Min. ON voltage / min. ON current	9.6 V / 2 mA	19.2 V / 2.5 mA		19.2 V / 2.5 mA
Max. OFF voltage / max. OFF current	2.5 V / 1 mA	5 V / 1.5 mA		5 V / 1.5 mA
Response time	OFF→ON	0.1 ms or less		0.2 ms or less
	ON→OFF	0.2 ms or less		0.2 ms or less
Input points per common	8 points / common	32 points / common		32 points / common
Operating mode indicator	16 points LED display (lights when ON)	32 points LED display (lights when ON)		32 points LED display (lights when ON, selectable by switch)
Connection method	Terminal block	40-pin MIL connectors		40-pin MIL connectors

Note: Changeable by settable input time constant

Item	Relay output unit	Transistor output units				I/O mixed unit (output side)
	16 points type	16 points (NPN)	32 points (NPN)	64 points (NPN)	16 points (PNP)	32 points (NPN)
Insulation method	Relay	Photocoupler			Photocoupler	
Nominal switching capacity	2 A 250 V AC / 2 A 30 V DC	-	-	-	-	-
Min. load	1 mA 100 mVDC (resistive load)	-	-	-	-	-
Output type	-	Open collector				-
Rated load voltage	-	5 to 24 V DC				-
Operating load voltage range	-	4.75 to 26.4 V DC				-
Max. load current	0.3 A (Y0 to Y7)	1 A	0.3 A (26.4 to 20.4 V DC) 30 mA (4.75 V DC)	0.3 A (20.4 to 26.4 V DC) 30 mA (4.75 V DC)	1 A	0.3 A (20.4 to 26.4 V DC) 30 mA (4.75 V DC)
	0.1 A (all)					
Common restriction	5 A	5 A	3.2 A / common		5 A	3.2 A / common
Max. surge current	-	3 A	0.6 A		3 A	0.6 A
OFF state leakage current	-	1 μA or less			1 μA or less	
ON state voltage drop	-	0.5 V or less			0.5 V or less	
Output points per common	16 points / common	16 points / common	32 points / common		16 points / common	32 points / common
Operation mode indicator	16 points LED display	16 points LED display	32 points LED display		16 points LED display	32 points LED display
Connection method	Terminal block	Terminal block	40-pin MIL connectors		Terminal block	40-pin MIL connectors

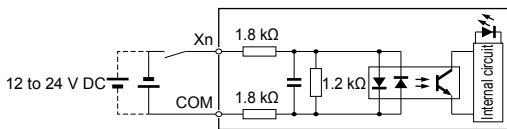
Output specifications

Item	Transistor output units		I/O mixed unit (output side)
	Source type (PNP open collector)		
	32 points type	64 points type	32 points type
Insulation method	Photocoupler		
Output type	Open collector		
Rated load voltage	5 to 24 V DC		
Load voltage allowable range	4.75 to 26.4 V DC		
Max. load current	0.3 A (Y0 to Y7)	0.3 A (26.4 to 20.4 V DC) 30 mA (4.75 V DC)	0.3 A (20.4 to 26.4 V DC) 30 mA (4.75 V DC)
	0.1 A (other than that above)		0.1 A (20.4 to 26.4 V DC) 15 mA (4.75 V DC)
Common restriction	3.2 A/common		
Max. surge current	0.6 A		
OFF state leakage current	1 μA or less		

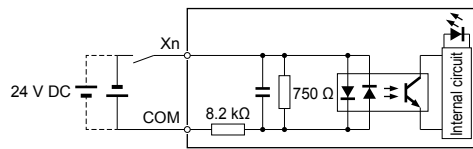
Item	Transistor output units		I/O mixed unit (output side)
	Source type (PNP open collector)		
	32 points type	64 points type	32 points type
ON state maximum voltage drop	0.5 V or less		
Repose time	OFF→ON	0.1 ms or less (at load current 2 mA or more)	
	ON→OFF	0.5 ms or less (at load current 2 mA or more)	
External power supply	Voltage	4.75 to 26.4 V DC	
	Current (at 24 V)	130 mA	90 mA/common
Surge absorber	Zener diode		
Short circuit protection	-		
Output points per common	32 points/common		
Operating mode indicator	32 points LED display (lights when ON)		32 points LED display (lights when ON, selectable by switch)
	Connector (MIL-compliant 40 pins, two use)		Connector (MIL-compliant 40 pins, one use)
External connection method	Connector (MIL-compliant 40 pins, two use)		Connector (MIL-compliant 40 pins, one use)

I/O circuit diagrams

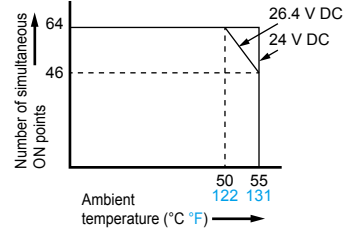
- DC input unit [input circuit diagrams]
[16 points]



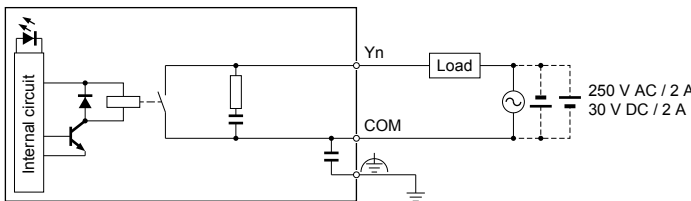
[32 points / 64 points]



Reduce simultaneous ON points according to the graph below.

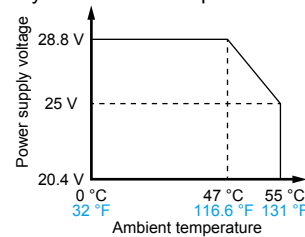


- Relay output unit [output circuit diagram]

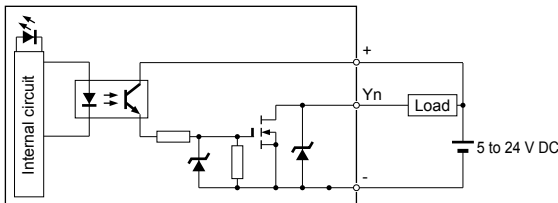


Limitations on power supply voltage

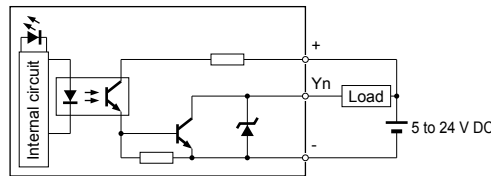
Reduce power supply voltage according to the graph below by the ambient temperature.



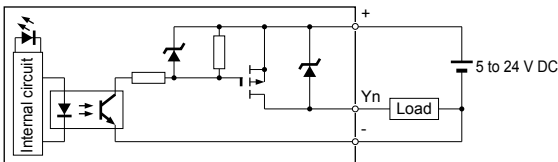
- Transistor output unit [output circuit diagram]
[Sink type, 16 points]



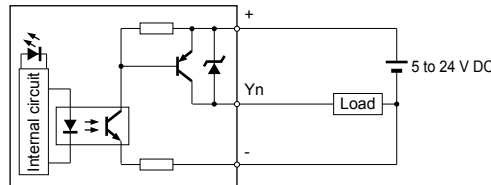
[Sink type, 32 points / 64 points]



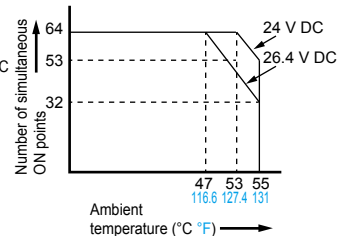
[Source type, 16 points]



[Source type, 32 points / 64 points]

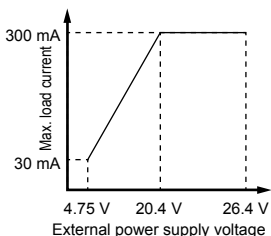


Limitations on simultaneous ON points [64 points]

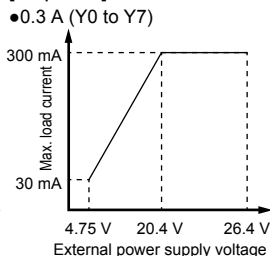


Note: Reduce load current according to the graph below by the external power supply voltage.

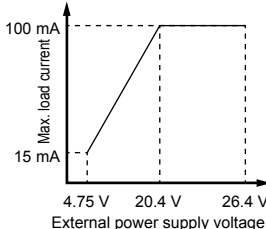
[32 points]



[64 points]



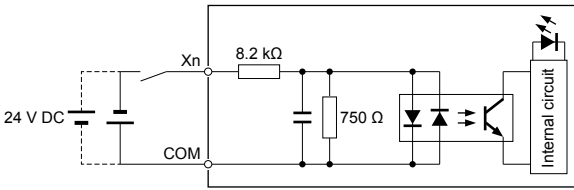
•0.1 A (except Y0 to Y7)



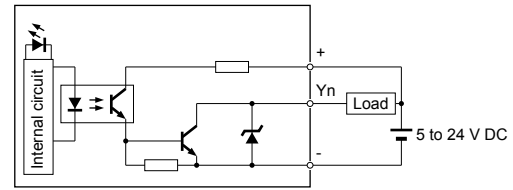
I/O circuit diagrams

I/O mixed unit [I/O circuit diagram]

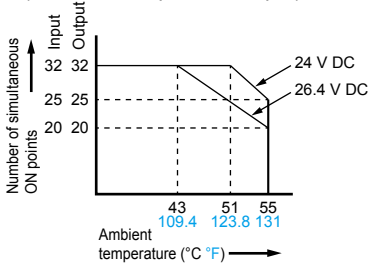
[Input circuit, sink type]



[Output circuit, sink type]



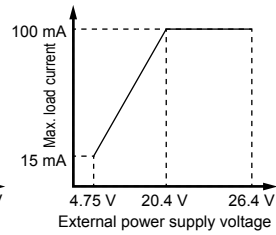
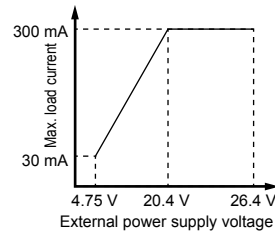
Limitations on simultaneous ON points (common to input and output)



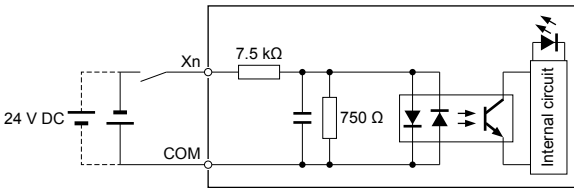
Note: Reduce load current according to the graph below by the external power supply voltage.

• 0.3 A (Y0 to Y7)

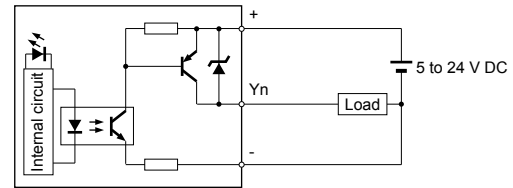
• 0.1 A (except Y0 to Y7)



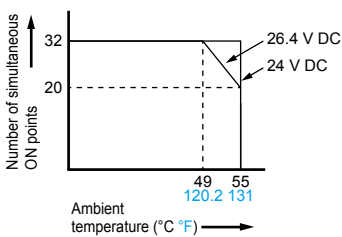
[Input circuit, source type]



[Output circuit, source type]



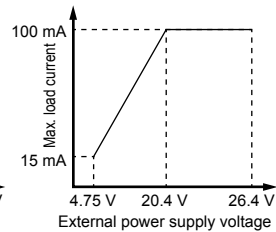
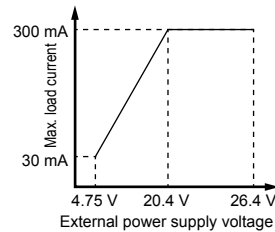
Limitations on simultaneous ON points (common to input and output)



Note: Reduce load current according to the graph below by the external power supply voltage.

• 0.3 A (Y0 to Y7)

• 0.1 A (except Y0 to Y7)



Analog input and output units



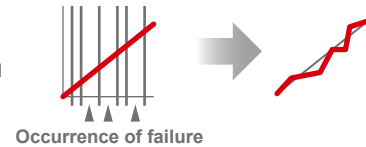
Channel insulation is switchable to support various devices

• 20 times faster conversion than in previous model

A conversion rate of 25 μ s/channel is possible, 20 times faster than the previous model's 500 μ s/channel conversion speed. The system's production efficiency can be improved due to precise control. High speed sampling can be achieved, independent of the PLC's scan time.

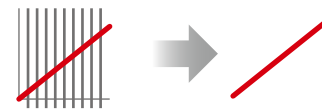
Dependent on scan of CPU

The scan gets delayed when the CPU slows down due to other processes and sampling becomes sporadic.



Sampling in the analog unit

Accurate sampling possible with fixed cycle.



• High-accuracy control

High-accuracy of $\pm 0.05\%$ (at 25 $^{\circ}$ C 77 $^{\circ}$ F) of full scale can be achieved. The high-resolution performance allows users to achieve reliable control.

• Noise-resistant with isolated channels

Channel insulation can be activated to guard against interference from other channels. No need to worry about the power supply system of the objects being measured.

■ Control specifications

Item		AFP7AD4H	
Number of input channels		4	
Input range	Voltage	-10 to +10 V (resolution: 1/62,500) 0 to 10 V (resolution: 1/31,250) 0 to 5 V (resolution: 1/31,250) 1 to 5 V (resolution: 1/25,000)	
	Current	0 to 20 mA (resolution: 1/31,250) 4 to 20 mA (resolution: 1/25,000)	
Conversion speed	Voltage / current	25 μ s/channel (at non-insulated channels) 5 ms/channel (at insulated channels)	
Overall accuracy		$\pm 0.05\%$ F.S. or less (at 25 $^{\circ}$ C 77 $^{\circ}$ F) $\pm 0.1\%$ F.S. or less (at 0 to 55 $^{\circ}$ C 32 to 131 $^{\circ}$ F)	
Input	Voltage input	1 M Ω	
	Current input	250 Ω	
Max. input range		-15 to +15 V voltage input -2 to +30 mA current input	
Insulation method	Between input terminals and internal circuit	Photocoupler and isolated DC/DC converter	
	Between channels	PhotoMOS relay	
Digital processing	Averaging	Number of times	Setting range: 2 to 60,000 times
		Time duration	Setting range: 1 to 1,500 ms (at non-insulated channels), 200 to 60,000 ms (at insulated channels)
		Moving	Range setting: 2 to 2,000 times
	Scale conversion setting	Any value within $\pm 30,000$	
	Offset setting	Any value within $\pm 3,000$	
Gain setting	Any value within 9,000 to 11,000		
Input range change method		Selectable per channel	
Conversion execution / non-execution channel setting		Selectable per channel unit	
Max. and min. value holding		Selectable for one channel	
Comparison of upper and lower limit values		Selectable per channel (hysteresis)	
Broken wire detection		When less than 0.7 V / 2.8 mA (only when voltage input range 1 to 5 V or current input range 4 to 20 mA is set.)	
Buffer function		3 trigger types: Soft trigger, External trigger and Input level	

Item		AFP7AD4H	
Trigger input section	Insulation method	Photocoupler	
	Rated input voltage	24 V DC	
	Rated input current	4.5 mA approx. (at 24 V DC)	
	Input impedance	5.1 k Ω approx.	
	Operating voltage range	21.6 to 26.4 V DC	
	Min. ON voltage / Min. ON current	19.2 V / 3.5 mA	
	Max. OFF voltage / Max. OFF current	5 V / 1.5 mA	
	Response time	OFF \rightarrow ON	0.2 ms or less
		ON \rightarrow OFF	0.2 ms or less
Input points per common	2 points/common		
Connection method		Terminal block (M3 terminal screw)	

■ Analog output specifications

Item		AFP7DA4H
Number of output channels		4
Output range	Voltage	-10 to +10 V (resolution: 1/62,500) 0 to 10 V (resolution: 1/31,250) 0 to 5 V (resolution: 1/31,250) 1 to 5 V (resolution: 1/25,000)
	Current	0 to 20 mA (resolution: 1/31,250) 4 to 20 mA (resolution: 1/25,000)
Conversion speed	Voltage / current	25 μ s/channel (at non-insulated channels) 5 ms/channel (at insulated channels)
Overall accuracy		$\pm 0.1\%$ F.S. or less (at 25 $^{\circ}$ C 77 $^{\circ}$ F) $\pm 0.3\%$ F.S. or less (at 0 to 55 $^{\circ}$ C 32 to 131 $^{\circ}$ F)
Output impedance (voltage output)		0.5 Ω or less
Max. output current (voltage output)		10 mA
Permissible output load resistance (Current output)		500 Ω or less
Insulation method	Between the input terminals and internal circuit	Photocoupler and isolated DC/DC converter
	Between channels	Not insulated
Scale conversion setting		Any value within $\pm 30,000$
Offset and gain function	Offset setting	Any value within $\pm 3,000$
	Gain setting	Any value within 9,000 to 11,000
Output range change method		Selectable per channel
Conversion execution/non execution channel setting		Selectable for one channel
Upper and lower output limit clip function		Selectable per channel
Analog output holding (in PROG mode)		Present value/any value/not holding
Connection method		Terminal block (M3 terminal screws)

High-speed Counter Units

One of the fastest in industry added in lineup



- **Industry-leading class speed of 16 Mpps (for differential input and 2-phase, 4-multiple)**

Accurate, real-time surveillance of inverter and motor rotation speed variation.

- **Supports 5 / 12 / 24 V DC and differential input.**

Supports wide range of interface from 12 to 24 V DC, 5 V DC and differential input with one unit.

- **Powerful application support**

Input pulse string frequency (period) can be measured inside the unit with built in periodical pulse counter function. Built-in ring counter function can easily detect index table position. Line speed adjustment and work length measurement are available with built-in clock that allows accurate time measurement.

- **Various functions can be used without a ladder program**

Capture function of count value	Finite difference calculation of capture value	Interrupt using comparison match
Comparison match and band comparison	Measurement of frequency and number of revolution	Reset of Z number and preset
Reset and preset of external signal	Built-in clock selection	

Specifications

Item	Type	2 ch type	4 ch type	
	Model No.	AFP7HSC2T	AFP7HSC4T	
Input	Insulation method	Photocoupler		
	Rated input voltage	12 to 24 V DC / 3.5 to 5 V DC		
	Input impedance	24 V DC / 5 V DC	3.0 kΩ approx. / 390 Ω approx.	
	Usage voltage range	24 V DC / 5 V DC	10.8 to 26.4 V DC / 3.5 to 5.25 V DC	
	Min. ON voltage / Min. ON current	24 V DC / 5 V DC	10 V DC / 4 mA / 3.0 V DC / 4 mA	
	Min. OFF voltage / Min. OFF current	24 V DC / 5 V DC	2.0 V DC / 2 mA / 1.0 V DC / 0.5 mA	
	Input time constant setting	None, 0.1 μs, 0.2 μs, 0.5 μs, 1.0 μs, 2.0 μs and 10.0 μs		
	No. of counters		2 ch	4 ch
Count function	Counter type	Linear counter / Ring counter		
	Counting range	Signed 32-bit (-2,147,483,648 to +2,147,483,647)		
	Max. input frequency	4 MHz / 8 MHz for individual input (phases A and B) (Duty ratio 50 ± 10 %) 4 MHz / 8 MHz for direction discrimination input (Duty ratio 50 ± 10 %) 4 MHz / 8 MHz / 16 MHz for 2-phase input (Duty ratio 50 ± 10 %, Phase shifting below 5 %)		
	Input signal	Phases A, B and Z		
	External I/O	Control signal input: 4 points (2 points/ch) External output: 4 points (2 points/ch)	Control signal input: 8 points (2 points/ch) External output: 8 points (2 points/ch)	
	Counter input type	Individual input: 1 multiple, 2-multiple Direction discrimination input: 1 multiple, 2-multiple 2-phase input: 1 multiple, 2-multiple, 4-multiple		
Measurement function	Frequency measurement function	Measures the intervals between the variations of count values, and calculates the frequency.		
Comparison function	Target value match function	Depending on the count direction, sets or resets the output when the counter value reaches the target value.		
External output	Comparison result output function	Outputs the result of comparison function.		
Other functions	Capture function	Acquires the current count value from the edges of input signals, and stores it in the capture 0 register or capture 1 register. The value of the specified capture register will be overwritten by a new value and the old value will be discarded every time a counter value is captured.		
	Interrupt input function	Available (2 points/ch, Max. 8 points/unit) (Note 1, 2)		

Notes: 1) The interrupt input function can be used for 8 points per unit and for a maximum of 8 units (max. 64 points) in the whole system. However, the entire scan time slows down as more interrupt programs are used. Minimize the use of interrupt programs.

2) The priority order for interrupt inputs is as follows; In a unit, from the smallest interrupt bit. In the whole system, from the smallest unit number. from the smallest unit number.

Positioning units

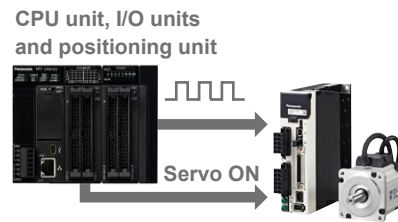


High-accuracy positioning control can be achieved at reduced cost.

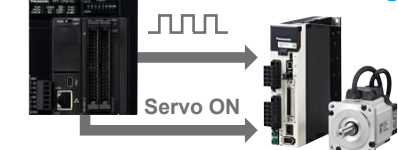
- **Equipped with electronic cam and electronic gear functions**
Virtual axes are supported and operable without connecting to external encoders.
- **Organized wiring to servo amplifier**
A servo ON output terminal is provided that allows simple and neat wiring to the servo amplifier.

- **Dedicated configuration tool “Control FWIN GR7 / Pro7”**

Parameter and positioning operation settings can be made easily. Test operation is also supported. Positioning operations can be checked even while the CPU unit is in program mode.



Reduced space and cost
Reduced debugging time



Performance specifications

Item		Specifications				
		2 axes type		4 axes type		
Part No.		AFP7PP02T	AFP7PP02L	AFP7PP04T	AFP7PP04L	
Output type		Transistor	Line driver	Transistor	Line driver	
Max. operation speed		500 kpps				
Number of axes controlled		2 axes linear interpolation and 2 axes circular interpolation		2 axes linear interpolation, 2 axes circular interpolation, 3 axes linear interpolation and 3 axes spiral interpolation		
Acceleration & deceleration time		0 to 10,000 ms for automatic & manual operation (JOG operation & home return)				
Acceleration & deceleration method		Linear acceleration / deceleration, S-curve acceleration / deceleration for automatic & manual operation (JOG operation)				
Automatic operation	Position control	Position command method		Absolute / relative		
		Number of positioning tables per axis		Standard area: 600 points, expansion area: 25 points		
		Control method	Independent		For each axis; standard area: 600 points, expansion area: 25 points	
			2-axis interpolation	Linear	E point, P point and C point controls: master axis speed	
				Circular	E point, P point and C point controls: center point or passing point	
		3-axis interpolation	Linear	E point, P point and C point controls		
Spiral	E point, P point and C point controls: center point or passing point					
Startup time		Standard area: 3 ms or less, expansion area: 5 ms or less				
Other function		Dwell time		0 to 32,767 ms (in increments of 1 ms)		
Manual operation	Home return	Linear acceleration / deceleration				
	Pulser operation	7 methods				
	Speed command	Range operates in synchronization with pulser input				
Stop function		Deceleration stop, emergency stop, limit stop, error stop, system stop				
Synchronous operation function	Synchronous basic setting		Existing axes, virtual axes or pulse input (1 to 4)			
	Master axis	Max. 2 axes		Max. 4 axes		
	Slave axis					
	Electronic gear & clutch function		Yes			
	Electronic cam function	Cam curve	Select from 20 types			
Resolution		1024, 2048, 4096, 8192, 16384, 32768				
Number of cam patterns		4 to 16				
Other specifications	Output mode		1 pulse output (pulse + direction), 2 pulse outputs (CW / CCW)			
	High-speed counter function	Countable range	-1,073,741,823 to +1,073,741,823 pulse			
	Input mode	Two-phase input, incremental/decremental control input, individual input (with multiplier function mode)				
	Built-in servo ON output		Yes			

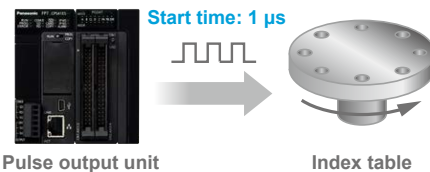
Pulse Output Units

Super high-speed positioning control achieved



• Startup speed is fastest in industry*

The pulse output request is received from the CPU unit and the startup speed up to output of the pulse is the industry's fastest at 1 μ s. Tact time is reduced with repeat of short-distance positioning operations, etc.



• Neater wiring to servo and amplifier

Equipped with a servo ON output terminal, wiring to the servo amplifier is neater.

• Replacement from FP2 series is easy

Usage is same as the previous FP2 positioning unit (multi-function type). Program transfer is easy.

* Based on our research as of October, 2013

■ Performance specifications

Item		Specifications			
Part No.		AFP7PG02T	AFP7PG04T	AFP7PG02L	AFP7PG04L
Output type		Transistor		Line driver	
Occupied points		Each 32 points of I/O	Each 64 points of I/O	Each 32 points of I/O	Each 64 points of I/O
Number of axes controlled		2 axes, independent	4 axes, independent	2 axes, independent	4 axes, independent
Position command	Command units	Pulse (The program specifies whether increment or absolute is used.)			
	Max. pulse count	Signed 32 bits (+2,147,483,647 to -2,147,483,648 pulses)			
Speed command	Command range	1 pps to 500 kpps (can set in 1 pps)		1 pps to 4 Mpps (can set in 1 pps)	
Acceleration/ deceleration command	Acceleration/ deceleration	Linear acceleration / deceleration, S acceleration / deceleration			
	"S" Acceleration/ deceleration	Can select from sin curve, secondary curve, cycloid curve and third curve.			
	Acceleration/ deceleration time	0 to 32,767 ms (can set in 1 ms)			
Home return	Home return speed	Speed setting possible (changes return speed and search speed)			
	Input signal	Home input, near home input, limit input (+), limit input (-)			
	Output signal	Deviation counter clear signal			
Operation mode		<ul style="list-style-type: none"> • E point control (linear and s acceleration/ decelerations) • P point control (linear and s acceleration/ decelerations) • Home return operation (home search) • JOG operation ^(Note 1) • JOG positioning operation • Pulsar input function ^(Note 2) transfer multiplication ratio ($\times 1, \times 2, \times 5, \times 10, \times 50, \times 100, \times 500, \times 1000$) • Real-time frequency change • Infinity output 			
Startup time		0.02 ms, 0.005 ms or 0.001 ms selecting possible ^(Note 3)			
Output interface	Output mode	1 pulse output (pulse and sign), 2 pulse output (CW and CCW)			
	Countable range	Signed 32 bits (+2,147,483,647 to -2,147,483,648 pulse)			
High-speed counter function ^(Note 2)	Input mode	Two-phase input, direction distinction input, individual input (with multiplier function mode)			
	Other functions	<ul style="list-style-type: none"> • Startup using I/O contact • Built-in limit (+) and limit (-) • With servo ON output 			
External power supply	Voltage	21.6 to 26.4 V DC			
	current	50 mA (at 24 V)	90 mA (at 24 V)	50 mA (at 24 V)	90 mA (at 24 V)

Notes: 1) When linear acceleration/ deceleration operation is selected, it is possible to change the target speed during operation.

2) Since the pulsar input function and the high-speed counter function use the same pulse input terminal, both functions cannot be used at the same time.

3) Startup time can be changed using the common memory control code setting. The factory (default) setting is 0.02 ms. Startup time is defined as the time between startup and output of the first pulse.

Power supply units



Announce system errors using the built-in external alarm.

- **Equipped with system error alarm contact**
Output contact for system error external alarm is provided.

■ Specifications

Item	Specifications	
	AFP7PSA1	AFP7PSA2
Part No.	AFP7PSA1	AFP7PSA2
Rated input voltage	100 to 240 VAC	
Allowable input voltage range	85 to 264 VAC	
Input power supply frequency	47 to 63 Hz	
Inrush current	40 A or less ^(Note 2)	
Input current	0.75 A or less	1.25 A or less
Rated output current (at 24 V)	1.0 A	1.8 A
Alarm contact capacity	1 A (30 V DC)	
Remaining lifespan counter	Not available	Available ^(Note 1)

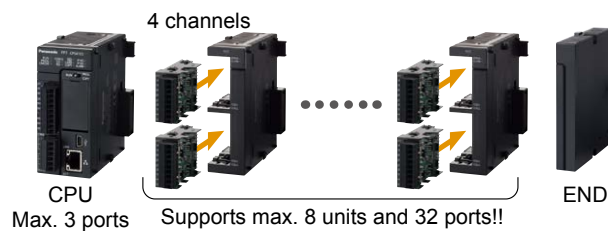
Notes: 1) Alarm by CPU unit
2) On cold starting

Serial Communication Unit



Lineup of serial communication unit that can be expanded with a serial communication cassette.

- **Two serial communication add-on cassettes can be installed**
A total of five types of cassettes can be freely combined in a combination of RS232C, RS422 or RS485. Up to 4 channels can be supported in one unit.
- **High expandability**
Serial Communication cassette can be added, max. 35 channels.

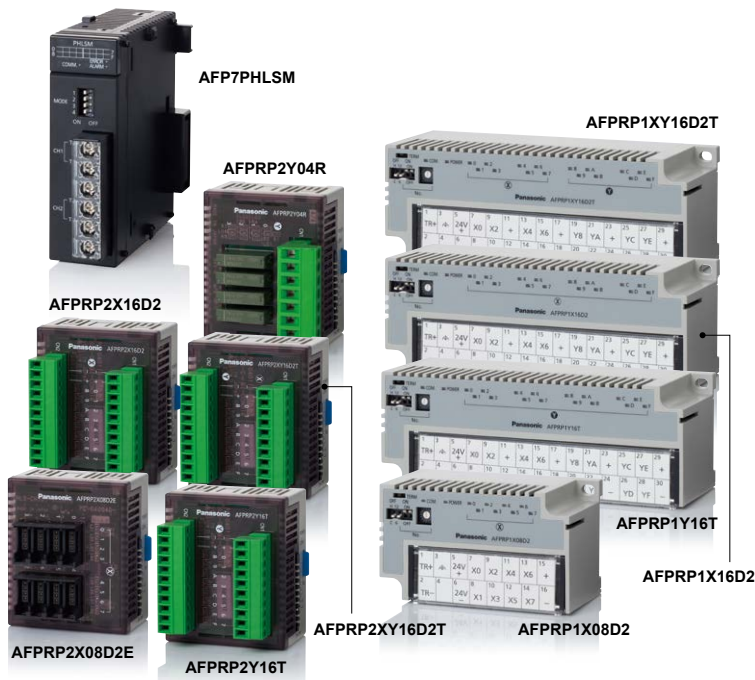


■ Specifications

Item	Specifications
Number of communication cassette installations	Max. 2 cassettes
Number of installations to CPU unit	Max. 8 units

Note: Ethernet cassette is not supported.

PHLS (remote I/O) units



Speedy, resistant to noise

- High speed communication**
 A 12 Mbps maximum transmission speed can be selected. Fast response at update cycle of 1,000 points / 2 ms can be achieved.
- High resistance to noise**
 Data can be transferred accurately, even in inadequate wiring environments.
- Various slave units**
 Compact slave units (60 × 70 × 40 mm 2.36 × 2.76 × 1.57 in) are smaller than common screw terminal types and are lined up to contribute to space savings. A wide variety of slave units are available.

Note: Compact type AFPRP2□ unit is not conforming to EMC Directive.

Communication specifications (common)

Item	Specifications
Communication method	Two-wire system half duplex
Insulation method	Pulse transformer insulation
Communication speed	6 Mbps / 12 Mbps
Synchronous method	Bit synchronization
Error check	CRC-12
Communication distance	Total length 200 m 656 ft (at 6 Mbps) / 100 m 328 ft (at 12 Mbps) (Note)
Connection method	Multi-drop method
Impedance	100 Ω
Terminator	Mounted on unit
External interface	Master unit: terminal block (2 channels) Slave unit (standard type): screw-type terminal block Slave unit (compact type): connector-type terminal block

Note: Performance when the recommended cable is used Use of the recommended cable is necessary to achieve the maximum transmission distance and number of slave units.

Input side specifications

Item	Specifications	
	Standard type	Compact type
Insulation method	Photocoupler	Non-isolated
Rated input voltage	24 V DC	
Rated input current	3 mA approx.	4.3 mA approx.
Input impedance	7.5 kΩ approx.	5.6 kΩ approx.
Min. ON voltage / Min. ON current	15 V / 2 mA	17 V / 2 mA
Max. OFF voltage / Max. OFF current	5 V / 0.5 mA	
Response time	OFF→ON	1 ms or less
	ON→OFF	1 ms or less

Recommended cable for conforming to EMC Directive

Please note that standard type AFPRP1□ conforms to EMC Directive when used with recommended cable as below (except for AFPRP2□).

ZHY221PS made by Shinko Seisen Industry Co., Ltd.

Characteristics

- AWG22 to AWG26, twisted pair cable
- Characteristics impedance: 100 Ω
- Insulation: crosslinked polyethylene foam

Note: If the recommended cable is not used, it may not be possible to reach the maximum transfer distance or performance with the maximum number of slaves. Please configure the wiring collinearly on all systems.

Output side specifications (except relay)

Item	Specifications	
	Standard type	Compact type (except relay)
Insulation method	Photocoupler	Non-isolated
Output type	Sink type (Open collector output)	
Rated load voltage	20.4 to 28.8 V DC	
Max. control capacity	0.1 A/point	
Max. surge current	0.5 A	
OFF state leakage current	0.1 mA or less	
ON state maximum voltage drop	0.5 V or less	
Repose time	OFF→ON	0.05 ms or less
	ON→OFF	0.5 ms or less
Surge absorber	Zener diode	
Short circuit protection	None	

Output side specifications (relay)

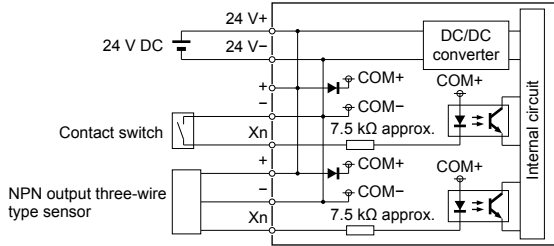
Item	Specifications	
	Compact type (relay)	
Insulation method	Relay insulation	
Rated control capacity	1 A 250 V AC (2 A/common) 1 A 30 V DC (2 A/common)	
Min. load	0.1 mA 100 mV (resistive load)	
Repose time	OFF→ON	10 ms or less
	ON→OFF	5 ms or less
Life time	Mechanical life	2 × 10 ⁷ operations or more
	Electrical life	1 × 10 ⁵ operations or more (switching frequency: 20 times/minute)
Surge absorber	None	
Short circuit protection	None	

I/O circuit diagrams

Standard type (screw-type terminal block)

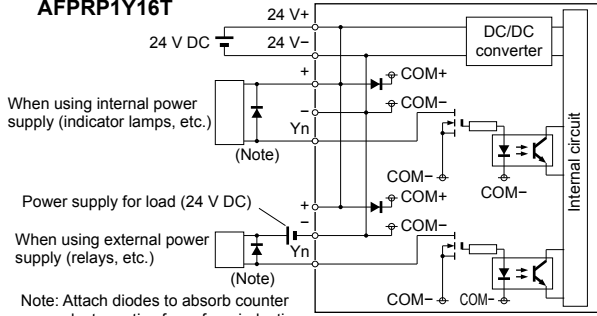
[Input type]

AFPRP1X08D2 / AFPRP1X16D2



[Output type]

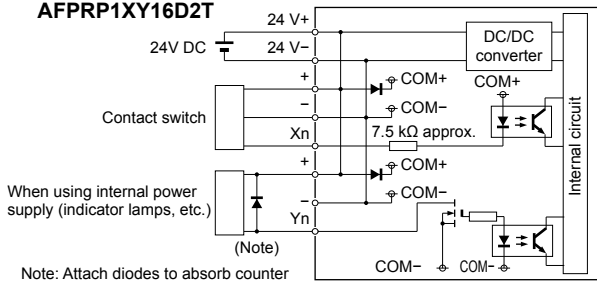
AFPRP1Y16T



Note: Attach diodes to absorb counter electromotive force from inductive load.

[I/O mixed type]

AFPRP1XY16D2T

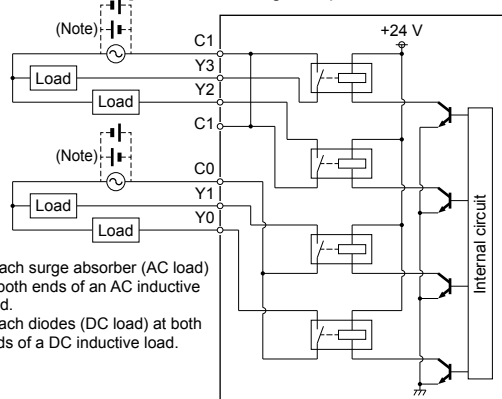


Note: Attach diodes to absorb counter electromotive force from inductive load.

Compact type (relay output)

AFPRP2Y04R

[When connecting to separated common terminal]

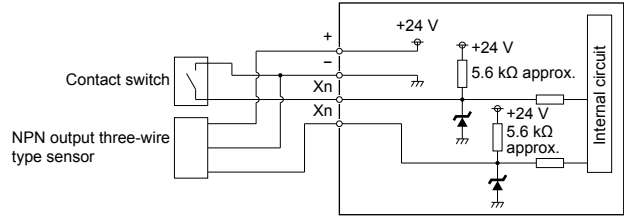


Note: Attach surge absorber (AC load) at both ends of an AC inductive load.
Attach diodes (DC load) at both ends of a DC inductive load.

Compact type (connector type terminal block)

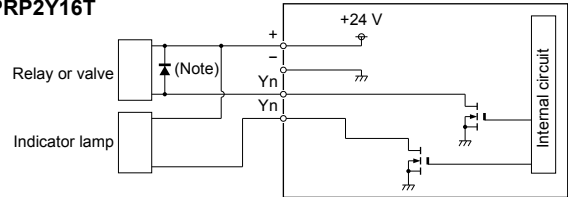
[Input type]

AFPRP2X16D2



[Output type]

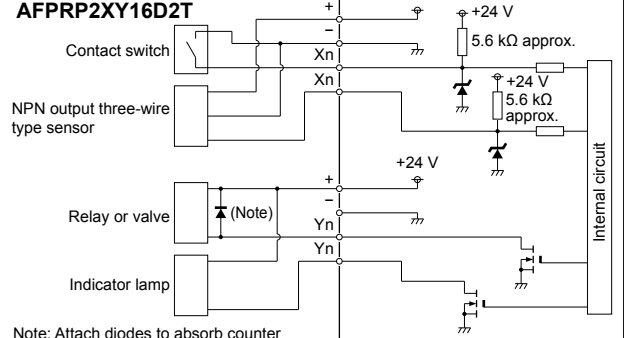
AFPRP2Y16T



Note: Attach diodes to absorb counter electromotive force from inductive load.

[I/O mixed type]

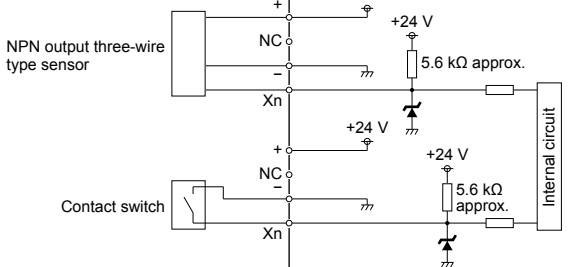
AFPRP2XY16D2T



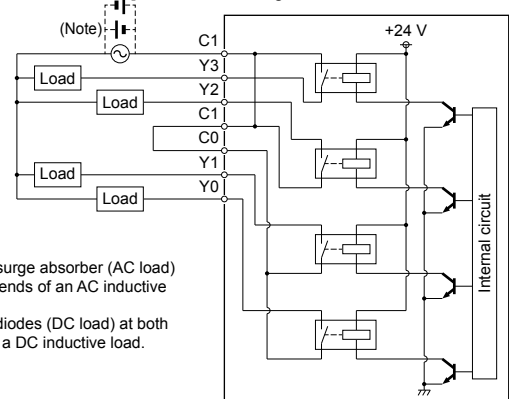
Note: Attach diodes to absorb counter electromotive force from inductive load.

Compact type (e-CON)

AFPRP2X08D2E



[When connecting to shared common terminal]



Note: Attach surge absorber (AC load) at both ends of an AC inductive load.
Attach diodes (DC load) at both ends of a DC inductive load.

General specifications on each units

Common general specifications

Item	Specifications
Ambient temperature	0 to +55 °C +32 to +131 °F, at storage: -40 to +70 °C -40 to +158 °F
Ambient humidity	10 to 95 % RH (at 25 °C 77 °F, no condensation), at storage: 10 to 95 % RH (at 25 °C 77 °F, no condensation)
Breakdown voltage	500 V AC for 1 minute ^(Note 2) ^(Note 3)
Insulation resistance	100 MΩ or more (at 500 V DC)
Vibration resistance	5 to 8.4 Hz, single amplitude of 3.5 mm 0.138 in, 1 sweep/min. (IEC61131-2); 8.4 to 150 Hz, constant acceleration of 9.8 m/s ² , 1 sweep/min. (IEC61131-2), 10 times each in X, Y, and Z directions
Shock resistance	147 m/s ² or more, 3 times each in X, Y, and Z directions (IEC61131-2)
Noise immunity	1,000 V [p-p] with pulse width 50 ns and 1 μs (using a noise simulator)
Operating condition	Free from corrosive gasses and excessive dust

Note: 1) Please refer to the unit's specification sheet for details of breakdown voltage and insulation resistance.
 2) Relay output of input and output unit: 2,300 V AC for 1 minute
 3) Between analog input channels of analog input unit: 200 V AC for 1 minute
 Between channels of output unit: non insulation

Individual general specifications

Item	CPU units			Communication cassettes						Function cassettes			
	AFP7CPS41E(S)	AFP7CPS31E(S)	AFP7CPS31(S)	AFP7CCS1	AFP7CCS2	AFP7CCM1	AFP7CCM2	AFP7CCS1M1	AFP7CCET1	AFP7FCAD2	AFP7FCA21	AFP7FCTC2	
Rated voltage range	20.4 to 28.8 V DC			-	-	-	-	-	-	-	-	-	
Current consumption	200 mA or less			35 mA or less ^(Note 1)	60 mA or less ^(Note 1)	60 mA or less ^(Note 1)	90 mA or less ^(Note 1)	70 mA or less ^(Note 1)	35 mA or less ^(Note 1)	40 mA or less ^(Note 1)	75 mA or less ^(Note 1)	45 mA or less ^(Note 1)	
Net weight	220 g approx. (with terminal block and end unit)			25 g approx. (with terminal block)						20 g approx.	25 g approx. (with terminal block)		

Item	Input and output units											
	AFP7X16DW	AFP7X32D2	AFP7X64D2	AFP7Y16R	AFP7Y16T	AFP7Y32T	AFP7Y64T	AFP7Y16P	AFP7Y32P	AFP7Y64P	AFP7XY64D2T	AFP7XY64D2P
Rated voltage range	-	-	-	-	-	-	-	-	-	-	-	-
Current consumption	25 mA or less	30 mA or less	35 mA or less	180 mA or less	35 mA or less	50 mA or less	75 mA or less	35 mA or less	50 mA or less	75 mA or less	55 mA or less	55 mA or less
Net weight	125 g approx.	95 g approx.	110 g approx.	180 g approx.	125 g approx.	95 g approx.	115 g approx.	125 g approx.	95 g approx.	115 g approx.	115 g approx.	115 g approx.

Item	Analog input and output units		High-speed counter units		Positioning units				Pulse output units			
	AFP7AD4H	AFP7DA4H	AFP7HSC2T	AFP7HSC4T	AFP7PP02T	AFP7PP04T	AFP7PP02L	AFP7PP04L	AFP7PG02T	AFP7PG04T	AFP7PG02L	AFP7PG04L
Rated voltage range	-	-	-	-	-	-	-	-	-	-	-	-
Current consumption	100 mA or less	250 mA or less	65 mA or less	65 mA or less	120 mA or less	120 mA or less	120 mA or less	120 mA or less	65 mA or less	65 mA or less	65 mA or less	65 mA or less
Net weight	130 g approx.	130 g approx.	130 g approx.	130 g approx.	145 g approx.	145 g approx.	145 g approx.	145 g approx.	130 g approx.	150 g approx.	130 g approx.	150 g approx.

Item	Serial communication unit	Power supply units	
	AFP7NSC	AFP7PSA1	AFP7PSA2
Rated voltage range	-	100 to 240 V AC	
Current consumption	35 mA or less	750 mA or less	1,250 mA or less
Net weight	110 g approx.	240 g approx.	290 g approx.

Item	PHLS (remote I/O) units										
	AFP7PHLSM	AFPRP1X08D2	AFPRP1X16D2	AFPRP1Y16T	AFPRP1XY16D2T	AFPRP2X08D2E	AFPRP2X16D2	AFPRP2Y16T	AFPRP2XY16D2T	AFPRP2Y04R	
Rated voltage range	-	20.4 to 28.8 V DC									
Current consumption	85 mA or less	100 mA or less	150 mA or less	75 mA or less	120 mA or less	100 mA or less	170 mA or less	40 mA or less	110 mA or less	85 mA or less	
Net weight	110 g approx.	140 g approx.	210 g approx.	210 g approx.	210 g approx.	75 g approx.	75 g approx.	75 g approx.	75 g approx.	75 g approx.	

Note: 1) This value is the increase in CPU current consumption.

Product types

CPU units

Product name		Standard program capacity	Max. program capacity	Operation speed	Ethernet function	Encryption function	Part No.
FP7 CPU units	Standard model	196 k steps	234 k steps	From 11 ns	Built-in	–	AFP7CPS41E
		120 k steps	120 k steps	From 11 ns	Built-in	–	AFP7CPS31E
		120 k steps	120 k steps	From 11 ns	–	–	AFP7CPS31
	Security enhanced type	196 k steps	234 k steps	From 11 ns	Built-in	Built-in	AFP7CPS41ES
		120 k steps	120 k steps	From 11 ns	Built-in	Built-in	AFP7CPS31ES
		120 k steps	120 k steps	From 11 ns	–	Built-in	AFP7CPS31S

Note: 1) One End unit is attached to the CPU unit. 2) When exporting to China, please use a CPU that does not have an encryption function.

Add-on cassettes

Product name	Specifications	Part No.
FP7 communication cassettes	RS232C, 1 channel (insulated)	AFP7CCS1
	RS232C, 2 channels (insulated)	AFP7CCS2
	RS422 or RS485, 1 channel (insulated)	AFP7CCM1
	RS422 or RS485, 2 channels (insulated)	AFP7CCM2
	RS232C, 1 channel (insulated) and RS485, 1 channel (insulated)	AFP7CCS1M1
	Ethernet 100Base-TX / 10Base-T	AFP7CCET1
FP7 function cassettes	Analog input, 2 channels, voltage / current	AFP7FCAD2
	Analog input and output, input: 2 channels, output: 1 channel	AFP7FCA21
	Thermocouple input, 2 channels K / J	AFP7FCTC2

Power supply units

Product name	Input specifications	Output specifications	Other functions	Part No.
FP7 power supply units	100 to 240 V AC	24 V DC, 1.0 A	System error alarm output contact	AFP7PSA1
	100 to 240 V AC	24 V DC, 1.8 A	System error alarm output contact and remaining lifespan counter	AFP7PSA2

Input and output units

Product name	Type	Number of points	Connection method	Specifications	Part No.
FP7 input units	DC input	16 points	Terminal block	12 to 24 V DC, common polarity: +/- common, input time constant setting	AFP7X16DW
		32 points	MIL connector	24 V DC, common polarity: +/- common, input time constant setting	AFP7X32D2
		64 points	MIL connector	24 V DC, common polarity: +/- common, input time constant setting	AFP7X64D2
FP7 output units	Relay output	16 points	Terminal block	2 A/point, 5 A/common, 16 points/common (without relay socket)	AFP7Y16R
		16 points	Terminal block	Load current: 1.0 A, 5 A/common, 16 points/common	AFP7Y16T
	Transistor output, sink (NPN)	32 points	MIL connector	Load current: 0.3 A, 3.2 A/common, 32 points/common	AFP7Y32T
		64 points	MIL connector	Load current: 0.3 A / 0.1 A, mixed 3.2 A /common, 32 points/common	AFP7Y64T
	Transistor output, source (PNP)	16 points	Terminal block	Load current: 1.0 A, 5 A/common, 16 points/common	AFP7Y16P
		32 points	MIL connector	Load current: 0.3 A, 3.2 A/common, 32 points/common	AFP7Y32P
FP7 input and output mixed units	DC input transistor output, sink (NPN)	Input: 32 points	MIL connector	Input: 24 V DC, 32 points/common Output: load current: 0.3 A / 0.1 A, mixed 3.2 A/common, 32 points/common	AFP7XY64D2T
		Output: 32 points			
FP7 input and output mixed units	DC input transistor output, source (PNP)	Input: 32 points	MIL connector	Input: 24 V DC, 32 points/common Output: load current: 0.3 A / 0.1 A, mixed 3.2 A/common, 32 points/common	AFP7XY64D2P
		Output: 32 points			

Analog input and output units

Product name	Specifications	Number of channels	Part No.
FP7 analog input unit (High-speed and high-accuracy type)	Voltage / current, conversion rate: 25 μ s/channel, resolution: max. 16 bits, accuracy: ± 0.05 % F.S. or less (at 25 °C 77 °F) / ± 0.1 % F.S. or less (0 to 55 °C 32 to 131 °F)	4 channels	AFP7AD4H
FP7 analog output unit (High-speed and high-accuracy type)	Voltage / current, conversion rate: 25 μ s/channel, resolution: max. 16 bits, accuracy: ± 0.05 % F.S. or less (at 25 °C 77 °F) / ± 0.1 % F.S. or less (0 to 55 °C 32 to 131 °F)	4 channels	AFP7DA4H

High-speed counter units

Product name	Specifications				Part No.
	Input time constant	Number of counters	Counter type	Input type	
FP7 high-speed counter units	Selection type	2 channels	Liner counter / ring counter	Individual input: 1 multiple, 2-multiple Direction discrimination input: 1 multiple, 2-multiple 2-phase input: 1 multiple, 2-multiple, 4-multiple	AFP7HSC2T
	Selection type	4 channels	Liner counter / ring counter	Individual input: 1 multiple, 2-multiple Direction discrimination input: 1 multiple, 2-multiple 2-phase input: 1 multiple, 2-multiple, 4-multiple	AFP7HSC4T

Positioning units

Product name	Specifications				Part No.
	Output type	Number of axes controlled	Operation speed	Functions	
FP7 positioning units	Transistor	2 axes	1 pps to 500 kpps	Electronic cam and electronic gear functions, linear interpolation, circular interpolation	AFP7PP02T
	Transistor	4 axes	1 pps to 500 kpps	Electronic cam and electronic gear functions, linear interpolation, circular interpolation	AFP7PP04T
	Line driver	2 axes	1 pps to 4 Mpps	Electronic cam and electronic gear functions, linear interpolation, circular interpolation	AFP7PP02L
	Line driver	4 axes	1 pps to 4 Mpps	Electronic cam and electronic gear functions, linear interpolation, circular interpolation	AFP7PP04L

Pulse output units

Product name	Specifications			Part No.
	Output type	Number of axes controlled	Operation speed	
FP7 pulse output units	Transistor	2 axes	1 pps to 500 kpps	AFP7PG02T
	Transistor	4 axes	1 pps to 500 kpps	AFP7PG04T
	Line driver	2 axes	1 pps to 4 Mpps	AFP7PG02L
	Line driver	4 axes	1 pps to 4 Mpps	AFP7PG04L

Serial communication unit

Product name	Number of communication cassette	Number of installations of CPU unit	Part No.
FP7 serial communication unit	Max. 2 cassettes	Max. 8 units	AFP7NSC

PHLS (remote I/O) master unit

Product name	Max. points	Communication speed	Total distance	Max. number of connections	Part No.
FP7 PHLS master unit	1,008 points	6 Mbps / 12 Mbps	200 m 656 ft (at 6 Mbps) / 100 m 328 ft (at 12 Mbps)	63 slaves	AFP7PHLSM

PHLS (remote I/O) slave units

Product name	Shape	Connection method	Type	Number of points	Specifications	Part No.
FP7 PHLS slave units	Standard type	Screw-type terminal block	DC input	8 points	24 V DC, common polarity: +, 8 points/common	AFPRP1X08D2
	Standard type	Screw-type terminal block	DC input	16 points	24 V DC, common polarity: +, 16 points/common	AFPRP1X16D2
	Standard type	Screw-type terminal block	Transistor output (sink)	16 points	Load current: 0.1 A, common polarity: -, 0.4 A/common, 16 points/common	AFPRP1Y16T
	Standard type	Screw-type terminal block	DC input transistor output (sink)	Input: 8 points Output: 8 points	Input: 24 V DC, common polarity: +, 8 points/common Output: load current: 0.1 A, common polarity: -, 0.4 A/common, 8 points/common * Input / output common is shared.	AFPRP1XY16D2T
	Compact type	e-CON	DC input	8 points	24 V DC, common polarity: +, 8 points/common	AFPRP2X08D2E
	Compact type	Connector-type terminal block	DC input	16 points	24 V DC, common polarity: +, 16 points/common	AFPRP2X16D2
	Compact type	Connector-type terminal block	Transistor output (sink)	16 points	Load current: 0.1 A, common polarity: -, 0.8 A/common, 16 points/common	AFPRP2Y16T
	Compact type	Connector-type terminal block	Transistor output (sink)	Input: 8 points Output: 8 points	Input: 24 V DC, common polarity: +, 8 points/common Output: load current: 0.1 A, common polarity: -, 0.8 A/common, 8 points/common * Input / output common is shared.	AFPRP2XY16D2T
	Compact type	Connector-type terminal block	Relay output	4 points	1 A/point, 2 A/common, 2 points/common	AFPRP2Y04R

Option

Product name	Specifications	Part No.
FP-X backup battery	Battery for back up of clock / calendar operation	AFPX-BATT

Programming tool

	Product name	Type	Specifications	Part No.
Programming software for Windows® Control FPWIN GR7	Japanese version	Supports only CPU without encryption function	Windows®8 (32 bits / 64 bits) / Windows®7 (32 bits / 64 bits) / Vista / XP SP3	AFPSSGR7JP
	Security enhanced type	Supports both CPU with / without encryption function		AFPSSGR7JPS
	English version	Supports only CPU without encryption function		AFPSSGR7EN
	Security enhanced type	Supports both CPU with / without encryption function		AFPSSGR7ENS
Programming software for Windows® Control FPWIN Pro 7	Multilingual	Supports only CPU without encryption function	Windows®8 (32 bits / 64 bits) / Windows®7 (32 bits / 64 bits) / Vista / XP SP3 Conforming to IEC61131-3	AFPSPR7
	Security enhanced type	Supports both CPU with / without encryption function		AFPSPR7S
	Multilingual for version upgrade	Supports only CPU without encryption function		AFPSPR7R
	Security enhanced type	Supports both CPU with / without encryption function		AFPSPR7SR

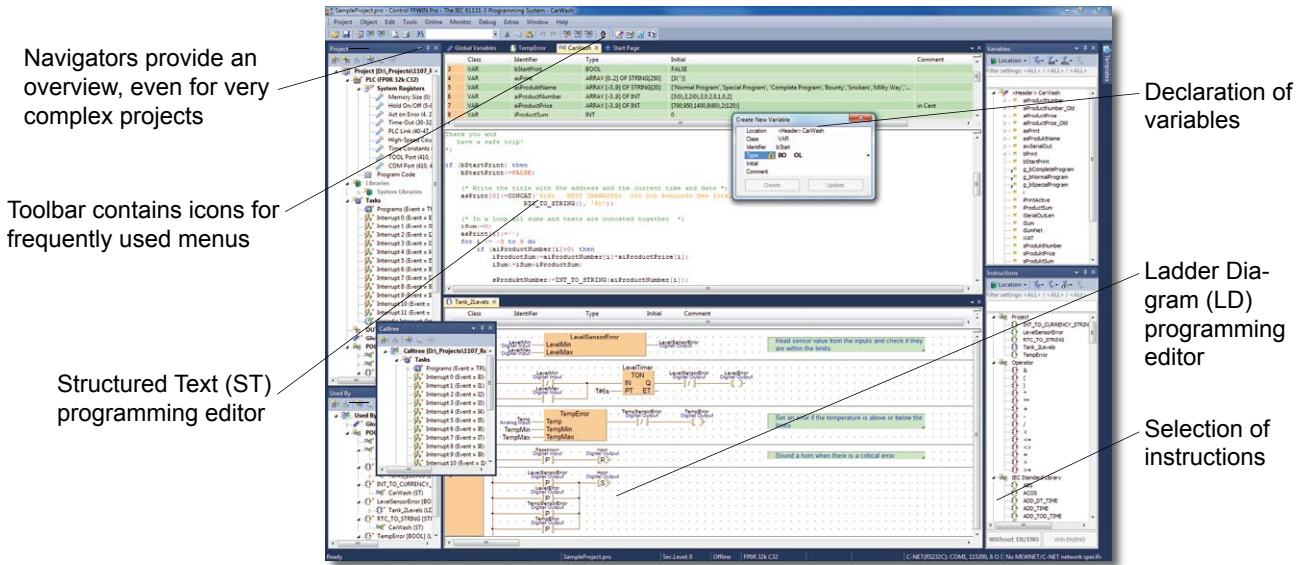
Notes: 1) Windows® 8, 7, Vista and XP are a trademark or registered trademark of Microsoft Corporation in the United States and other countries.
 2) When exporting to China, CPU without encryption function is required.
 3) Multilingual: English, German, French, Italian, Spanish, Japanese, Korean and Chinese are supported.

Programming software

Control FPCWIN Pro 7

Control FPCWIN Pro is the Panasonic programming software developed according to the international standard IEC 61131-3 (for Windows® XP / Vista / 7). Control FPCWIN Pro is the universal software for all Panasonic PLC's

- Programs written in Control FPCWIN Pro 6 or earlier versions will run with Control FPCWIN Pro 7
- Programs are compatible across FP series PLCs, e.g. FP0R will run with minor adjustments on FPΣ (Sigma) and FP7 PLCs
- FP7 PLCs and Control FPCWIN Pro 7 offer the same flexible choice of editors and allow you to select the programming language you are most familiar with.



Control FPCWIN 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)
- 8 languages are fully supported: English, German, French, Italian, Spanish, Japanese, Korean, Chinese
- 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
- Min. 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.

Control FWIN Pro and its comprehensive, powerful libraries

The PLC programming software Control FWIN Pro has been evolving for over 15 years. As expected, the latest version of the software includes even more function blocks to help you efficiently program your PLC.

The innovations of this version include simplified handling of analog units, serial communication, the integrated clock and GT programmable displays. The online help was also improved in several key areas:

- Tables for slot number and corresponding address ranges are provided for analog expansion units.
- Explanations for DIP switch settings
- A/D value assignment tables
- Wiring instructions

Additional function blocks for simplifying work with analog values, e.g.:

- Scaling
- Averaging
- Assigning addresses for expansion units

The new function blocks for serial communication cover 90 % of all practical applications, except for telecontrol.

Moreover, diverse tasks for GT series programmable displays are now easy to manage, e.g. changing screens, adjusting brightness, or controlling control bits and words. Working with times and dates as well as calculations involving times and dates are now extensively supported.

The editors, such as the global variable list editor, offer quick info about PLC addresses, which makes adjusting addresses in the variable declarations as easy as pie.

You can drag & drop variables, function blocks, etc. from the navigation and selection panes into the program editors.

You can copy & paste example programs in the online help into your editor and modify them as necessary.



Programming software

Control FFWIN GR7

Control FFWIN GR7 is the software that helps to reduce programmers workload.



Configuration, editing programming, searching, monitoring, debugging, security, etc.

PLC programming demands a lot of time and effort. Many programmers get hung up on trying out different configurations, consulting the manual, and re-writing repetitive code blocks.

The **FFWIN GR7** programming software is designed to eliminate these inefficiencies and minimize programming complexity.

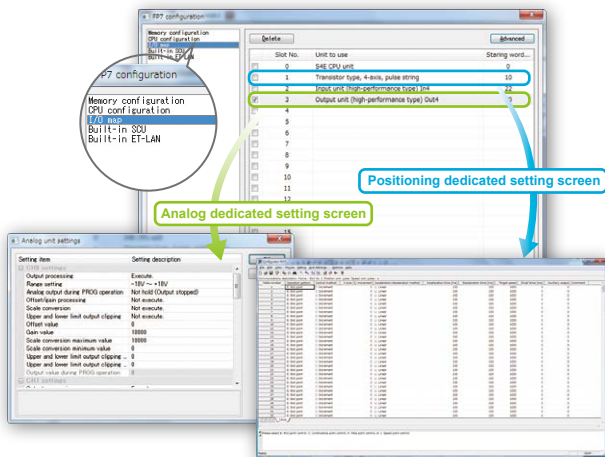
The screenshot shows the FFWIN GR7 software interface with several callout boxes pointing to specific features:

- Project tree:** Located on the left side, showing a hierarchical view of the project files.
- Program block:** Points to the main ladder logic editor area, which displays two control blocks with their respective runtimes and step numbers.
- I/O comment:** Points to a column in the ladder logic editor where three types of comments can be entered.
- Task bar:** Points to the bottom of the software window, which contains various status and control buttons.
- Output window:** Points to the bottom-left pane, which displays the history of outputs and errors.
- Function bar:** Points to the bottom-center pane, which contains a grid of function keys for quick access to various PLC instructions.
- Device monitor:** Points to the bottom-right pane, which shows a table of device status.

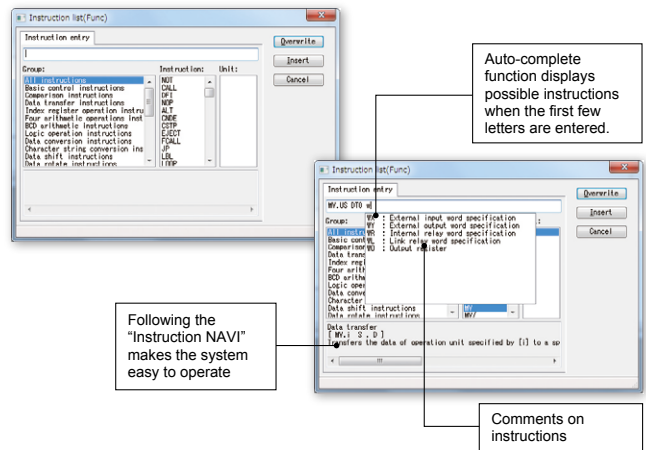
No.	PB	Device	Current value	Data type	Comment	
1	Global	X183	0	---	Operation SW 3	
2	Global	R20	0	---	Grinding signal 1	
3	Global	X184	0	---	Operation SW 4	
4	Global	X186	0	---	Operation SW 6	
5	Global	X200	0	---	Grinding lamp	
6	Global	R21	0	---	Grinding signal 2	
7	Global	X185	0	---	Operation SW 5	
8	Global	R22	0	---	Measurement start sig	
9	Global	DT48	FFFF	Hexadecimal (16-bit)	Control table	
10	Global	Y235	0	---	Indicator lamp	
11	Global	R20	0	---	Transfer signal	
12	Global	DT12	120	Unsigned 16-bit integer	Input data	
13	Global	R20	0	---	Unsigned 16-bit integer	Stored data
14						
15						
16						
17						

Control FPWIN GR7 highlights

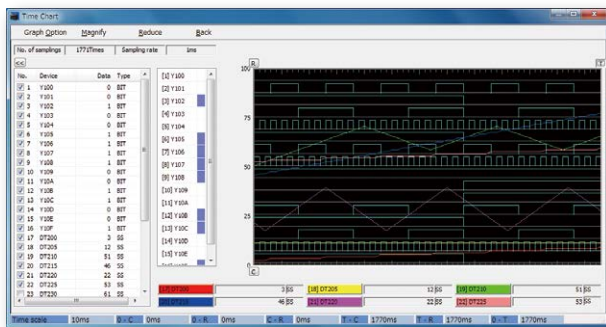
No programming is required in initial setting of each unit



“Instruction NAVI” helps to input programming

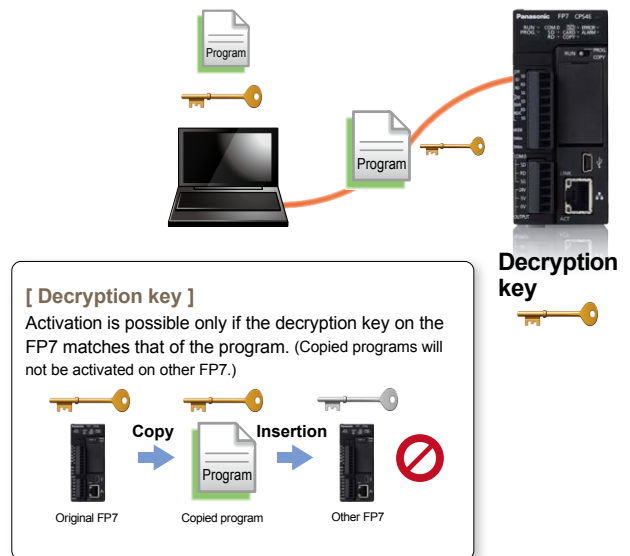


During debugging, data collection and confirmation by 1 scan is available



Secured, prevents program copy

Security enhanced type only



GT series Lineup



List of related products Programmable display GT series

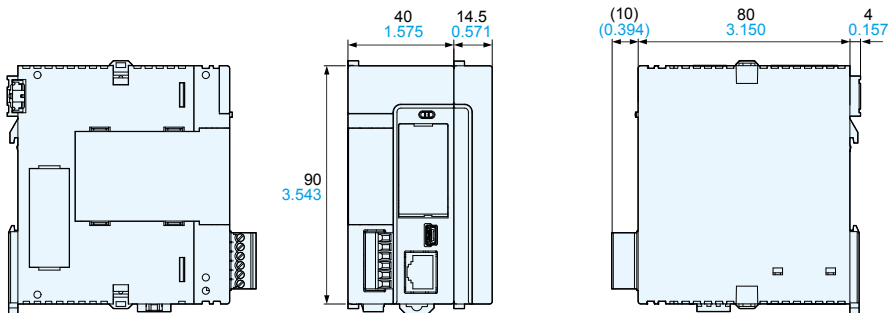
Product name	Description						Part No.	
	LCD	Screen size	Power supply	Communication port	Color of front panel	SD memory card slot		
Tough GT03M-E	TFT monochrome LCD	3.5 inch	24 V DC	RS232C	Silver	Not available	AIG03MQ03DE	
	TFT color LCD			RS422 / RS485			Silver	Available
TFT monochrome LCD		RS232C		Silver	Available	AIG03TQ15DE		
	TFT color LCD	RS422 / RS485				Silver	Available	AIG32MQ03DE
Tough GT32M-E		TFT monochrome LCD	5.7 inch	RS232C	Silver			Available
	RS422 / RS485			Silver		Available	AIG32TQ03DE	
Tough GT32T-E	TFT color LCD	5.7 inch	RS232C		Silver		Available	AIG32TQ05DE
			RS422 / RS485	Silver		Available		AIG32TQ05DE
GT02L	STN monochrome LCD (white backlight)	3.7 inch	5 V DC		RS232C		Black	Not available
				RS422 / RS485	Black	Not available		
GT02M	STN monochrome LCD (white/pink/red backlight)	3.8 inch	5 V DC	RS232C			Pure black	Not available
				RS422 / RS485	Hairline silver	AIG02MQ03D		
					Pure black	AIG02MQ04D		
			24 V DC	RS232C	Hairline silver	AIG02MQ05D		
				RS422 / RS485	Pure black	AIG02MQ12D		
					Hairline silver	AIG02MQ13D		
		3.8 inch	24 V DC	5 V DC	RS232C	Pure black	Available	AIG02MQ14D
					RS422 / RS485	Hairline silver		AIG02MQ15D
						Pure black		AIG02MQ22D
			24 V DC	RS232C	Hairline silver	AIG02MQ23D		
				RS422 / RS485	Pure black	AIG02MQ24D		
					Hairline silver	AIG02MQ25D		
GT02G	STN monochrome LCD (green/orange/red backlight)	3.8 inch	5 V DC	RS232C	Pure black	Not available	AIG02GQ02D	
				RS422 / RS485	Hairline silver		AIG02GQ03D	
					Pure black		AIG02GQ04D	
			24 V DC	RS232C	Hairline silver		AIG02GQ05D	
				RS422 / RS485	Pure black		AIG02GQ12D	
					Hairline silver		AIG02GQ13D	
		3.8 inch	24 V DC	5 V DC	RS232C	Pure black	Available	AIG02GQ14D
					RS422 / RS485	Hairline silver		AIG02GQ15D
						Pure black		AIG02GQ22D
			24 V DC	RS232C	Hairline silver	AIG02GQ23D		
				RS422 / RS485	Pure black	AIG02GQ24D		
					Hairline silver	AIG02GQ25D		
GT05M	STN monochrome LCD (white/pink/red backlight)	3.5 inch	24 V DC	RS232C	Pure black	Available	AIG05MQ02D	
				RS422 / RS485	Hairline silver		AIG05MQ03D	
GT05G	STN monochrome LCD (green/orange/red backlight)	3.5 inch	24 V DC	RS232C	Pure black	Available	AIG05MQ04D	
				RS422 / RS485	Hairline silver		AIG05MQ05D	
GT05S	TFT color LCD	3.5 inch	24 V DC	RS232C	Pure black	Available	AIG05GQ02D	
				RS422 / RS485	Hairline silver		AIG05GQ03D	
GT12M	STN monochrome LCD (white/pink/red backlight)	4.6 inch	24 V DC	RS232C	Pure black	Not available	AIG05GQ04D	
				RS422 / RS485	Hairline silver		AIG05GQ05D	
GT12G	STN monochrome LCD (green/orange/red backlight)	4.6 inch	24 V DC	RS232C	Pure black	Not available	AIG05SQ02D	
				RS422 / RS485	Hairline silver		AIG05SQ03D	
GT32M	STN monochrome LCD	5.7 inch	24 V DC	RS232C	Pure black	Available	AIG05SQ04D	
				RS422 / RS485	Hairline silver		AIG05SQ05D	
GT32T0	TFT color LCD	5.5 inch	24 V DC	RS232C	Pure black	Available	AIG12MQ02D	
				RS422 / RS485	Hairline silver		AIG12MQ03D	
GT32T1	TFT color LCD	5.5 inch	24 V DC	RS232C	Pure black	Available	AIG12MQ04D	
				RS422 / RS485	Hairline silver		AIG12MQ05D	
Terminal GTWIN Ver.2	Japanese version			Terminal GTWIN	CD-ROM		AIG12MQ12D	
	English version			Terminal GTWIN	CD-ROM		AIG12MQ13D	
Terminal GTWIN Ver.2 Upgrade*1	Japanese version			Terminal GTWIN	CD-ROM		AIG12MQ14D	
	English version			Terminal GTWIN	CD-ROM		AIG12MQ15D	

*1 This upgrades Terminal GTWIN Ver. 1 to Ver. 2.

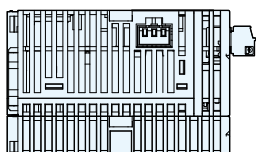
Dimensions (unit: mm in)

CPU units

AFP7CPS41E AFP7CPS41ES AFP7CPS31E AFP7CPS31ES AFP7CPS31 AFP7CPS31S



*CPU unit + End unit



*AFP7CPS31 and AFP7CPS31S do not have an Ethernet port.

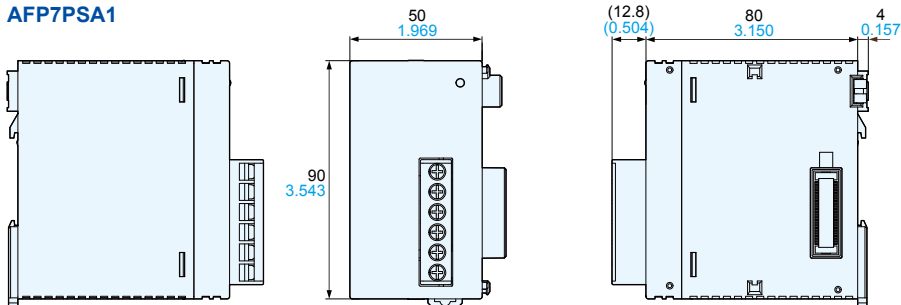
Add-on cassettes

AFP7CCS1 AFP7CCS2 AFP7CCM1 AFP7CCM2 AFP7CCET1
AFP7CCS1M1 AFP7FCA21 AFP7FCAD2 AFP7FCTC2

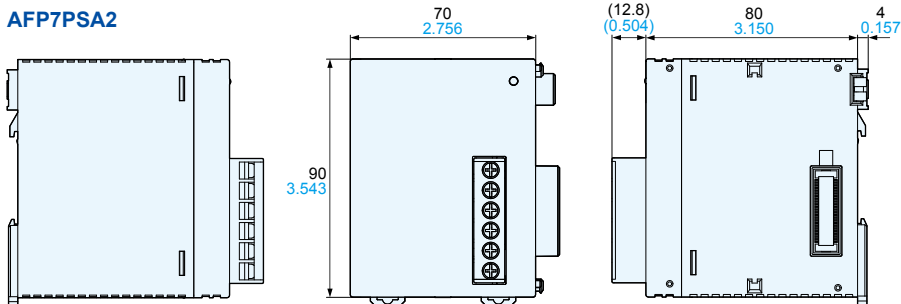


Power supply units

AFP7PSA1

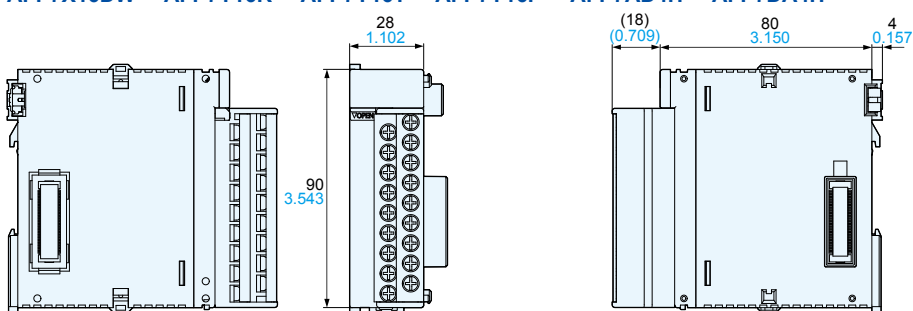


AFP7PSA2



Input and output units / Analog input and output units

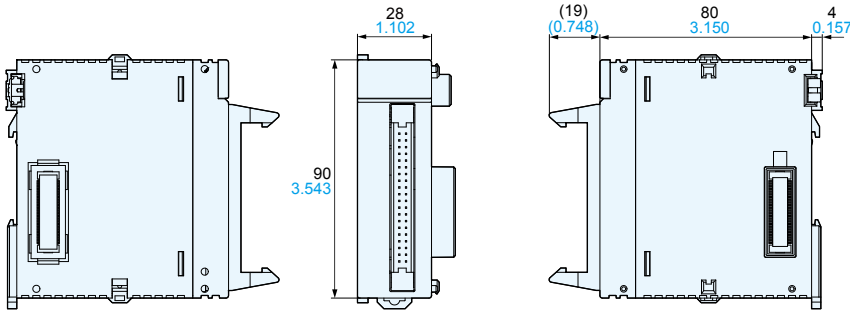
AFP7X16DW AFP7Y16R AFP7Y16T AFP7Y16P AFP7AD4H AFP7DA4H



Dimensions (unit: mm in)

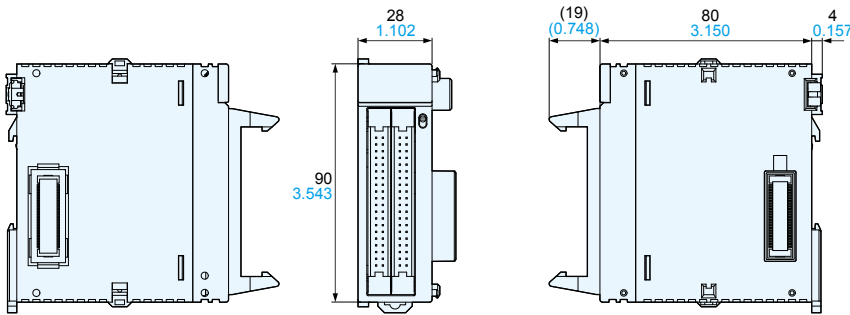
Input and output units / Positioning units / High-speed counter unit / Pulse output units

AFP7X32D2 AFP7Y32T AFP7Y32P AFP7PP02T AFP7PP02L AFP7HSC2T AFP7PG02T AFP7PG02L



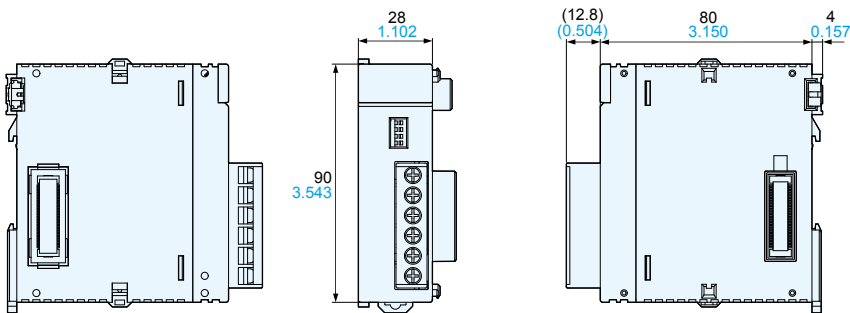
Input and output units / Positioning units / High-speed counter unit / Pulse output units

AFP7X64D2 AFP7Y64T AFP7Y64P AFP7XY64D2T AFP7XY64D2P AFP7PP04T AFP7PP04L AFP7HSC4T
AFP7PG04T AFP7PG04L



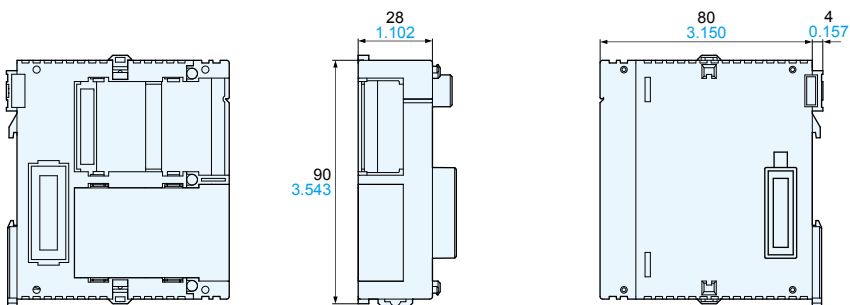
PHLS master unit

AFP7PHLSM



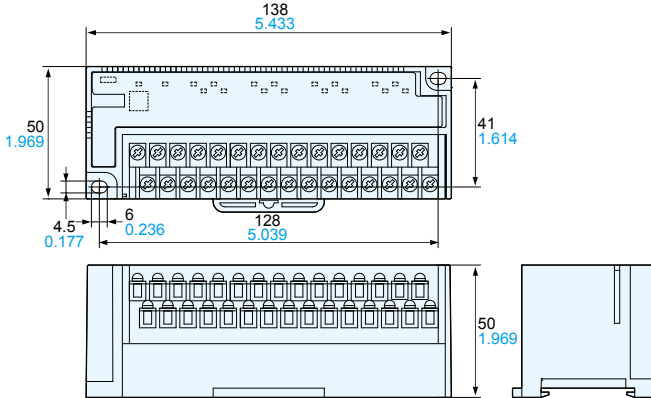
Serial communication unit

AFP7NSC



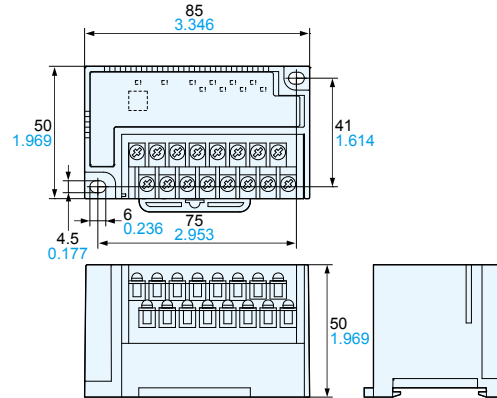
PHLS slave units (standard type)

AFPRP1X16D2 AFPRP1Y16T AFPRP1XY16D2T



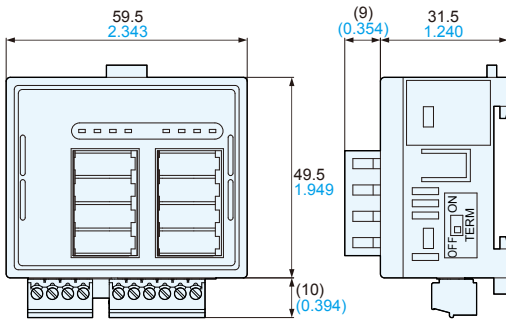
PHLS slave unit (standard type)

AFPRP1X08D2



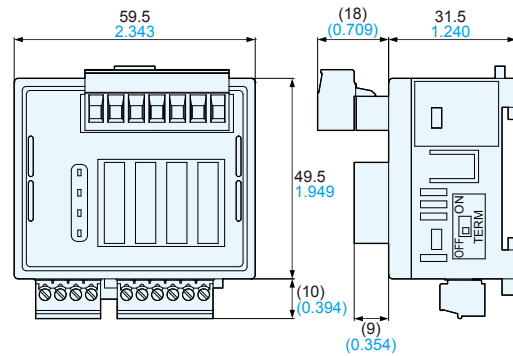
PHLS slave unit (e-CON)

AFPRP2X08D2E



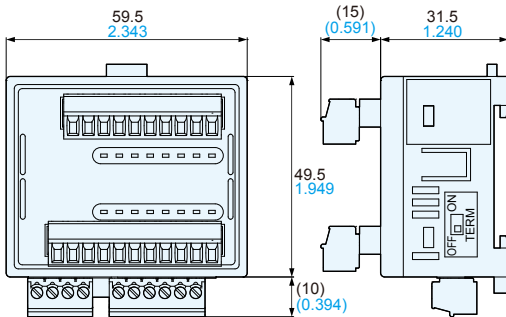
PHLS slave unit (connector type and relay output)

AFPRP2Y04R



PHLS slave units (connector type)

AFPRP2X16D2 AFPRP2Y16T AFPRP2XY16D2T



FP7:

Panasonic know-how inside!

Panasonic has a large number of factories worldwide. All our industry PLCs contain the experience and expertise of our machine and production engineers.

FP7: Very fast & flexible

One of the fastest PLCs in the world: 11 ns per program step! Program capacity of up to 220,000 steps, data memory of up to 500,000 words, and up to 32 GB expandable memory using SDHC card.



FP7: very small & powerful

FP7: connects worlds

Programming, monitoring, remote control and communication with other automation devices is possible all over the world.

FP7: green & clean

Panasonic specifies 14 forbidden and hazardous substances, which are not used in our products. We permit less than one-tenth of the level allowed by the RoHS guideline for the 6 most important hazardous substances and we have forbidden the use of another 8 hazardous substances in our products that are not even covered by the RoHS guideline.

Please contact

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