Panasonic

Programmable Controller

FP7 SERIES

CE
Conforming to
EMC Directive

Ideal for Simple Standalone Systems

Achieve high-performance extensibility, lower cost and slimmer form factor.

Space saving

NEW

**FP7 CPU unit
Low cost type**

AFP7CPS21

34 mm
1.339 in

Another FP7 advantage: add-on cassette system reduces unit cost and footprint.

Function cassettes
• Analog input
• Analog input and output
• Thermocouple input
Communication cassettes
• Serial
• Ethernet

16 intelligent units can be mounted

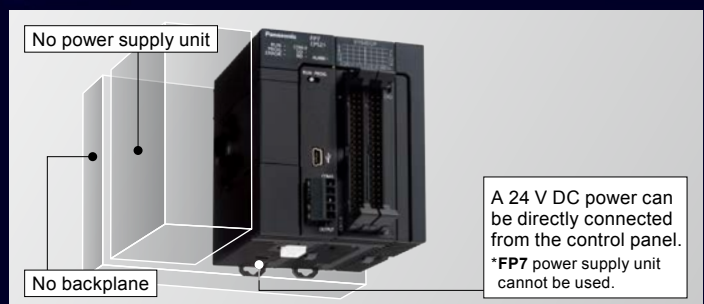Low in cost, 16 intelligent units can be mounted.

Up to 16 units can be mounted!

No battery means no maintenance
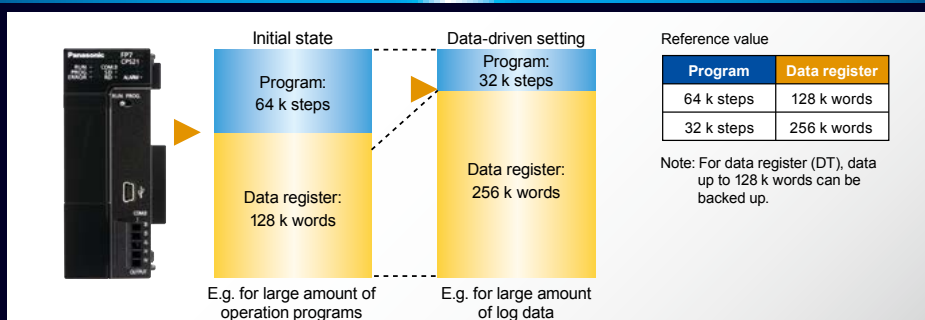
Data backup without battery (max. 128 k words)
Also, clock / calendar function data holding time doubled from one week (previous model) to two weeks.

Without the requirement of a power supply unit or backplane, installation cost and footprint are reduced.

No power supply unit

No backplane

A 24 V DC power can be directly connected from the control panel.
*FP7 power supply unit cannot be used.

Use program and data register sharing to resolve data space shortage. No need repurchase expensive upgrade models.

Initial state

Program:
64 k steps

Data register:
128 k words

E.g. for large amount of operation programs

Data-driven setting

Program:
32 k steps

Data register:
256 k words

E.g. for large amount of log data

Reference value

Program	Data register
64 k steps	128 k words
32 k steps	256 k words

Note: For data register (DT), data up to 128 k words can be backed up.

FP7 CPU unit features

Compact design and class-leading high performance

- **High-capacity SD (SDHC) memory cards of up to 32 GB are supported.**
  Enables large storage for log data *Without low cost type CPU unit
- **High performance (min. scan time 1ms, max. 20 μs for 60 k steps)**
  The processing speed is less susceptible to frequent Ethernet communication.
- **All communications ports are safely isolated**
  Confidently use any port - RS422 / RS485 and LAN ports, as well as USB and RS232C ports - each is isolated.
- **High function types, increased security function (encryption), are available.**
  *When exporting to China, please use a CPU that does not have an encryption function.

AFP7CPS21 AFP7CPS41E(S) AFP7CPS31E(S) AFP7CPS31(S)

■ PRODUCT TYPES

Product name		Standard program capacity	Max. program capacity	Operation speed	Ethernet function	SD memory card function	Encryption function (Note 2, 3)	Part No.
FP7 CPU units	Standard model	196 k steps	234 k steps	From 11 ns	Built-in	Built-in	–	**AFP7CPS41E**
		120 k steps	120 k steps	From 11 ns	Built-in	Built-in	–	**AFP7CPS31E**
		120 k steps	120 k steps	From 11 ns	–	Built-in	–	**AFP7CPS31**
	Security enhanced type	196 k steps	234 k steps	From 11 ns	Built-in	Built-in	Built-in	**AFP7CPS41ES**
		120 k steps	120 k steps	From 11 ns	Built-in	Built-in	Built-in	**AFP7CPS31ES**
		120 k steps	120 k steps	From 11 ns	–	Built-in	Built-in	**AFP7CPS31S**
	Low cost type	64 k steps	64 k steps	From 14 ns	–	–	–	**AFP7CPS21**

Notes: 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.
3) For CPU units with encryption function, please use the security enhanced type programming tools.

■ Performance specifications

Item		AFP7CPS41E(S) (Note 6)				
Memory capacity	Memory selection pattern (Note 1)	1	2	3 (Factory default)	4	5
	Program (steps) (Note 2)	234,000	221,500	196,000	144,500	51,500
	Data register (words) (Note 2)	65,536	131,072	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 (Factory default)	2	3	4
	Program (steps) (Note 2)	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		AFP7CPS21	
Memory capacity	Memory selection pattern (Note 1)	1 (Factory default)	2
	Program (steps) (Note 2)	64,000	32,000
	Data register (words) (Note 2)	131,072	262,144
	Number of max. program block (PB)	128	64

Item	AFP7CPS41E(S) / AFP7CPS31E(S) / AFP7CPS31(S) / AFP7CPS21
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 (**AFP7CPS21**: 14 ns/step)
External input (X)/output (Y)	8,192 points (Note 4) / 8,192 points (Note 4)
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 / With switching function
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. *except for **AFP7CPS21**
Constant scan	Available (0 to 125 ms)
Real time clock (Note 3)	Built in. Date backup with battery.
Battery life	3.3 years or more (at 25 °C 77 °F) (when no power is supplied) *except for **AFP7CPS21**
Safety function (Note 5)	Password / Restricted distribution / Read disable setting / Encryption
PLC Link function	Max. 16 units, link relays: 1,024 points, link registers: 128 words. (Data transfer and remote programming are not supported) (Link area allocation is switchable between the first and the second half)

Notes: 1) The factory default setting is pattern 3 for **AFP7CPS41E(S)** and pattern 1 for **AFP7CPS31E(S)**, **AFP7CPS31(S)** and **AFP7CPS21**.
2) For data register (DT), data up to 262,144 words can be backed up.
3) 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
4) Hardware configuration governs the actually usable number of I/O points. When I/O points are not actually used, usable as internal relays.
5) Encryption can be used for **AFP7CPS41ES**, **AFP7CPS31ES** and **AFP7CPS31S**.
6) Products with an "**S**" at the end of a part number have the encryption function.

■ COM port communication specifications

Item	Specifications
Interface	RS232C, three-wire system, 1 channel (Note 1)
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
	End code: CR / CR + LF / none / ETX
Data transmission order	Transmit from bit 0 in character units.
Communication mode	General-purpose communication, Computer link and MODBUS-RTU

Note: 1) SD, RD and SG terminals are isolated from internal circuits.

■ Dedicated power supply output port specifications for GT series programmable display

Output terminal (Note 1)	Connecting Programmable Display model
5 V	For 5 V DC type **GT** series Programmable Display
24 V (Note 2)	For 24 V DC type **GT** series Programmable Display

Notes: 1) 5 V and 24 V DC types are not usable at the same time.
2) Use 21.6 to 26.4 V DC to power the CPU unit.
Please check the "**GT** Series Hardware Manual" for grounding of the **GT** series programmable display.
The **AFP7CPS21** is not provided with this port.

■ LAN port communication specifications [except for AFP7CPS31(S) / AFP7CPS21]

Item	Specifications
Communication interface	Ethernet 100BASE-TX / 10BASE-T
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. 220 connections (user connection: 216, system connection: 4)
Communication protocol (Communication layer)	TCP / IP, UDP
DNS	Supports name servers
DHCP / DHCPV6	Automatic IP address acquisition
FTP server / Client (SSL compatible)	Server function, file transfer, number of user: 3 Client function, data and file transfer
HTTP server / Client (SSL compatible)	Server function, system web, Customer web (8 MB), number of concurrent session: 16 Client function, data transfer
SMTP client (SSL compatible)	Client function, mail transfer
SNTP	Time adjustment function
General-purpose communication	16 kB / 1 connection (user connection: 1 to 16)
Dedicated communication	Slave communication (MEWTOCOL-COM, MEWTOCOL7-COM, MEWTOCOL-DAT, MODBUS-TCP, MC protocol (Note 1)) Master communication (MEWTOCOL-COM, MEWTOCOL-DAT, MODBUS-TCP, MC protocol (Note 1))

Note: 1) MC protocol is a short form denoting MELSEC communication protocol; MELSEC is a registered trademark of Mitsubishi Electric Corporation.
QnA compatible 3E frame, only binary (bulk writing and bulk reading) use is available.

Panasonic Industrial Devices SUNX Co., Ltd.