


Select the functions you need
and control various devices!

5 V input
[Encoder / microcomputer /
two-wire system sensor, etc.]



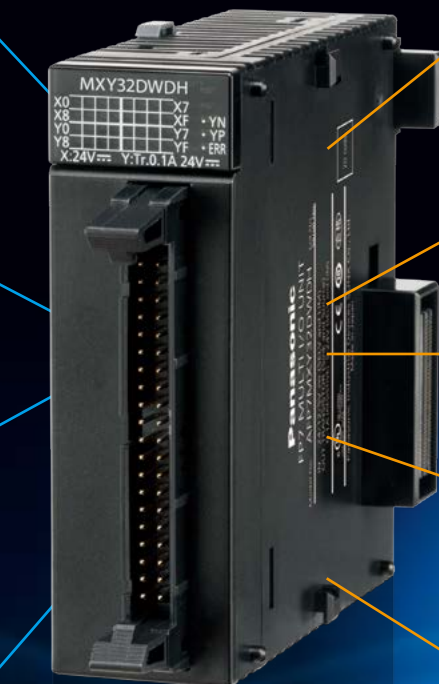
DC input



Interrupt input



**High-speed
counter input**

Transistor output
NPN, PNP, Differential
output and 5 V



Comparison output



Pulse output



PWM output



**Positioning
output***



Multi Input/Output Unit **NEW**
AFP7MX32DWDH Positioning type

*Supports only positioning type

■ **Multi Input/Output Unit**
AFP7MX32DWD

■ **Multi Input/Output Unit** **NEW**
AFP7MX32DWDH Positioning type



Best value model CPU unit
AFP7CPS21



Best value model CPU unit
AFP7CPS21

Select the functions you need among the many available and achieve a wide range of control with one unit.

You can choose.
Maximum
 Input: 16 points
 Output: 16 points

Add-on cassettes

- Serial port
- Analog input and output
- Ethernet port

Best value model
 CPU unit
AFP7CPS21

RS232C port



Multi Input/Output Unit **NEW**
AFP7MXY32DWDH Positioning type

Input

Choose among total 16 points as follows. **High-speed**

- DC input: Max. 16 points
- High-speed counter: Max. 4 channels, 500 kHz (at input voltage 5 V/12 V), 250 kHz (at input voltage 24 V)
- Interrupt input: Max. 8 points

Supports wide range of devices such as encoders and two-wire system sensors. **Industry first***

- Input level: 5 to 24 V (automatic switchover)
 - Input time constants: None, 1 μs, 2 μs, 4 μs, 8 μs, 16 μs, 2 ms, 4 ms
- *Based on our research as of April, 2016

Output

Choose among total 16 points as follows. **High-speed**

- Transistor output: Max. 16 points
- Pulse output: Max. 4 channels, 500 kHz
- PWM output: Max. 4 channels, 100 kHz
- Positioning output: Max. 4 channels, 500 kHz
- Comparison output: Max. 8 points

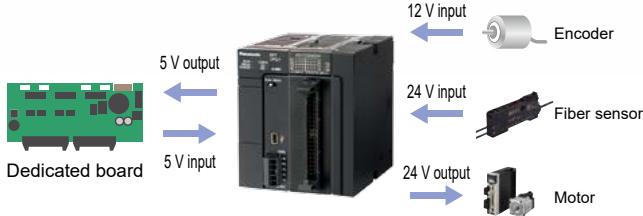
Supports ultra-high speed pulse output and dual polarity. **Industry first***

- Output polarity: N/P channel, Both channels (push pull) and Differential output
- *Based on our research as of April, 2016

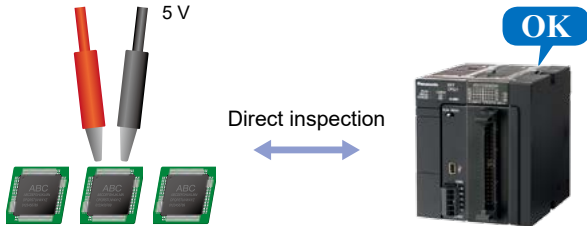
For example

Control possible of connected dedicated boards, custom-built jigs, and all types of sensors

Can also be used for central control of devices with different voltage and as a converter for 5 V devices.



Capable of direct inspection in inspection lines for 5 V drive electronic components.



Accomplish motor positioning at the best price.

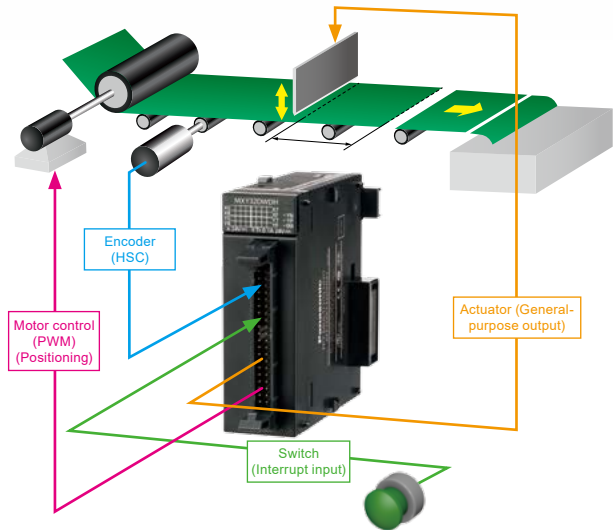


Complex control achieved in one unit

Control high-speed counter, positioning and I/O with one unit

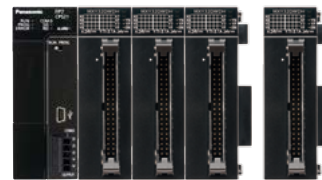
Example
 Encoder input × 1 channel Interrupt input × 4 points
 Positioning output × 1 channel General-purpose output × 4 points

Applications are only limited by the terminal allocations possible.



CPU unit can be expanded with maximum of 16 units

Total of 512 inputs and outputs possible



Total 256 inputs

- DC input: Max. 256 points
- High-speed counter: Max. 64 channels
- Interrupt input: Max. 128 channels

Total 256 outputs

- Transistor output: Max. 256 points
- Pulse output: Max. 64 channels
- PWM output: Max. 64 channels
- Comparison output: Max. 128 channels

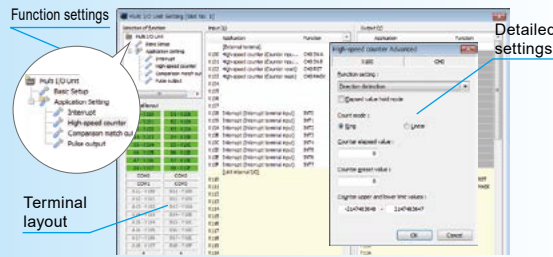
Control FPWIN GR7

Easily accomplish complex control!

Rich in support functions for programs that utilize many functions.

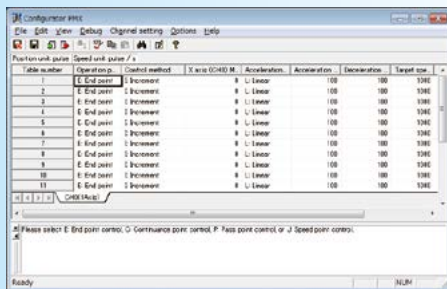
1 Initial settings screen (Function allocation setting)

Easily select the functions to use and the I/O number allocations.



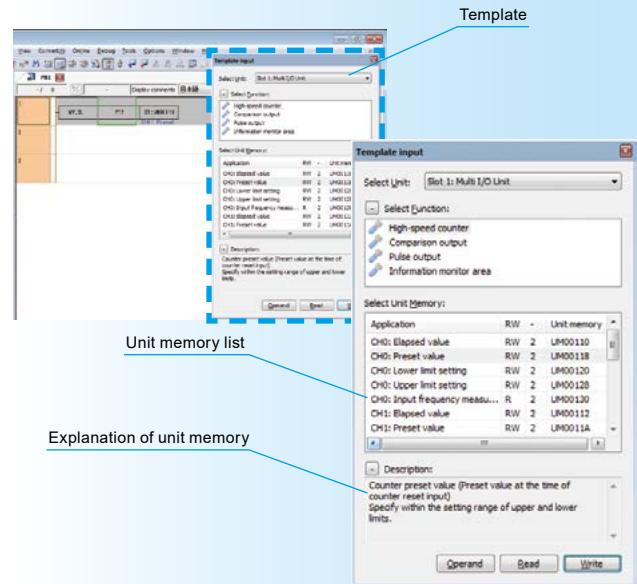
2 Configurator PMX (Setting tool for positioning output)

To set the positioning table, simply select the parameters at the configuration screen.



3 Template screen (Programming aid)

In the window for unit memory access, simply select from the list and click either the "Read" or the "Write" button to build the transfer commands on the ladder. You no longer need to consult the manual nor worry about incorrect data sizes.



Product types

Product name		Standard program capacity	Max. program capacity	Operation speed	Ethernet function	SD memory card function	Encryption function (Note 2) (Note 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
Best value model	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.

Unit lineup (extract)

Product name	Number of points	Connection method	Specifications	Part No.
Input unit (DC input)	16 points	Terminal block	12 to 24 V DC, common polarity: +/- common, input time constant setting	AFP7X16DW
Output unit [Transistor output, sink (NPN)]	16 points	Terminal block	Load current: 1.0 A, 5 A/common, 16 points/common	AFP7Y16T
Multi input/output unit	Input: 16 points Output: 16 points	MIL connector	Input: Total 16 points •DC input: Max. 16 points •High-speed counter: Max. 4 channels (1 channel: 4 points) •Interrupt input: Max. 8 points Output: Total 16 points •Transistor output: Max. 16 points •Pulse output: Max. 4 channels (Note) (1 channel: 4 points) •PWM output: Max. 4 channels (1 channel: 4 points) •Comparison output: Max. 8 points •Positioning: Max. 4 channels (Only AFP7MX32DWDH)	NEW AFP7MX32DWD
				NEW AFP7MX32DWDH
High-speed counter units	2 channels	MIL connector	Liner counter / ring counter, Individual input: 1 multiple, 2-multiple, Direction distinction input: 1 multiple, 2-multiple, 2-phase input: 1 multiple, 2-multiple, 4-multiple	AFP7HSC2T
	4 channels			AFP7HSC4T
Pulse output units	2 axes	MIL connector	Transistor, 1 pps to 500 kpps	AFP7PG02T
	4 axes			AFP7PG04T

Note: Trapezoidal control with acceleration / deceleration not yet supported.

Programming tools

Product name	Type	Specifications	Part No.
Programming software for Windows® Control FPWIN GR7	Japanese version	Supports only CPU without encryption function	Windows®10 (32 bit / 64 bit) / Windows®8 (32 bit / 64 bit) / Windows®8.1 (32 bit / 64 bit) / Windows®7 SP1 and over (32 bit / 64 bit) / Vista SP2 / XP SP3
	Security enhanced type	Supports both CPU with / without encryption function	AFPSPR7JP
	English version	Supports only CPU without encryption function	AFPSPR7JPS
	Security enhanced type	Supports both CPU with / without encryption function	AFPSPR7EN AFPSPR7ENS
Programming software for Windows® Control FPWIN Pro7	English, Japanese, Korean and Chinese	Supports only CPU without encryption function	AFPSPR7A
	Security enhanced type	Supports only CPU with encryption function * The encryption function will be offered in the future.	AFPSPR7AS

Notes: 1) Windows® 10, 8, 7, Vista and XP are trademarks or registered trademarks of Microsoft Corporation in the United States and other countries.
 2) When exporting to China, CPU without encryption function is required.

Specifications

Control specifications (AFP7CPS21)

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
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. 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		
Constant scan	Available (0 to 125 ms)		
Real time clock ^(Note 3)	Built in. Date backup with battery.		
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 1.
 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.

COM port communication specifications (AFP7CPS21)

Item	Specifications
Interface	RS232C, three-wire system, 1 channel ^(Note)
Transmission distance	15 m 49.213 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: SD, RD and SG terminals are isolated from internal circuits.

Dedicated power supply output port specifications for GT series programmable display (AFP7CPS21)

Output terminal	Connecting programmable display model
5 V	For 5 V DC type GT series Programmable Display

Function specifications (AFP7MXY32DWD / AFP7MXY32DWDH)

Item	AFP7MXY32DWD	AFP7MXY32DWDH
Basic input and output	Number of occupied I/O points	Input/Output: 64 points each (4 words) Input/Output: 96 points each (6 words)
	Number of external I/O points	Input: 16 points, Output: 16 points
Interrupt	Input time constant setting	None, 0.5 μs, 1 μs, 2 μs, 4 μs, 8 μs, 16 μs, 32 μs, 64 μs, 96 μs, 128 μs, 256 μs, 2 ms, 4 ms, 8 ms Setting possible in 2-point units
	Output polarity setting	No output, N channel, P channel, Both channels (push pull output), Differential output Setting possible in 4-point units
Counter	Number of points	8 points/unit (Max. of 8 units can be used with FP7 system.)
	Mode	Non-interrupt unit, Interrupt unit (Set using DIP switches)
Pulse output	Interrupt condition setting	Terminal input, Comparison match
	Counter type	Ring counter Linear counter
	Input mode	Direction distinction, Individual input, Phase input
	Number of channels	4 channels ^(Note 1)
	Counting range	Signed 32 bit (-2,147,483,648 to +2,174,483,647) Setting possible of upper and lower limits
	Max. counting speed	5 V input voltage: 500 kHz ^(Note 2) 12 V input voltage: 500 kHz (350 kHz with phase input) ^(Note 2) 24 V input voltage: 250 kHz (180 kHz with phase input) ^(Note 2)
	Min. input pulse width	0.5 μs
	Comparison output setting	Max. 8 points Terminal input counter: 4 channels
	Others	Transfer multiplication function (× 1, × 2, × 4) Elapsed value offset/preset function Elapsed value hold function, setting of upper/lower count limits Input pulse frequency measurement Overflow/underflow detection
	Number of channels	4 channels
Output mode	Direction distinction, Individual output, Phase output, Comparison match stop	
Output terminals	Pulse output function	2 terminals/channel (B11 to B18 terminals)
	PWM output function	1 terminal/channel (B11, B13, B15 and B17 terminals)
	Pulse output frequency	1 to 500 kHz ^(Note 3) (Settable by 1 Hz)
	PWM output frequency	1 to 100 kHz ^(Note 3) (Settable by 1 Hz)
Duty ratio	Pulse output function	50 % approx. (Fixed)
	PWM output function	0 to 100 % (Settable by 0.1%)
Other functions	Pulse number measurement function (dedicated pulse counter 4 channels)	

Notes: 1) When using elapsed value hold function, number of channels will be limited.
 2) With 50 % duty input pulse.
 3) When push pull setting or output current is 0.1 A. Varies according to load.

Positioning function specifications (AFP7MXY32DWDH)

Item	AFP7MXY32DWDH	
Number of axes controlled	Max. 4 axes	
Common specifications	Position setting mode	Increment, Absolute
	Output interface	Transistor open collector output, Push-pull, Line driver ^(Note 1)
	Pulse output method	Pulse + Sign, CW + CCW
	Max. output frequency	500 kHz
	Output pulse duty ratio	When using table setting mode: 50 % (Fixed)
	Control unit	Pulse
	Position setting range	-1,073,741,824 to +1,073,741,823 pulses
	Speed command range	Pulse: 1 to 500,000 Hz
	Max. operation speed	500 kHz
	Acceleration/deceleration method	Linear acceleration/deceleration
Position control	Acceleration time	1 to 10,000 ms (Settable by 1 ms)
	Deceleration time	1 to 10,000 ms (Settable by 1 ms)
	Number of positioning tables	20 tables for each axis (Up to 2 tables can be executed consecutively.)
	Control method (Single axis)	PTP control (E point control, C point control), CP control (P point control), Speed control (J point control) ^(Note 2) ^(Note 3)
	Control method (2-axis linear interpolation)	E point, P point, C point controls, Composite speed or Long axis speed setting
	Dwell time	0 to 32,767 ms (Settable by 1 ms)
JOG operation	Speed command range	Pulse: 1 to 500,000 Hz ^(Note 3)
	Acceleration/deceleration method	Linear acceleration/deceleration
	Acceleration time	1 to 10,000 ms (Settable by 1 ms)
Home return	Deceleration time	1 to 10,000 ms (Settable by 1 ms)
	Speed command range	Pulse: 1 to 500,000 Hz
	Acceleration/deceleration method	Linear acceleration/deceleration
Stop function	Acceleration time	1 to 10,000 ms (Settable by 1 ms)
	Deceleration time	1 to 10,000 ms (Settable by 1 ms)
	Return method	DOG methods (3 types), Home position method, Data set method
	Deceleration stop	Performs deceleration stop in the deceleration time of a running operation for each axis.
	Emergency stop	Stops in a deceleration time specified for the emergency stop for each axis.
System stop	Limit stop	Stops in a deceleration time specified for the limit input for each axis.
	System stop	Stops all axes immediately.

Notes: 1) The number of axes is reduced when setting Line driver.
 2) The J point control is executable only for the two axes of CH0 and CH1.
 3) When performing the J point control or JOG operation, the speed can be changed after the startup.