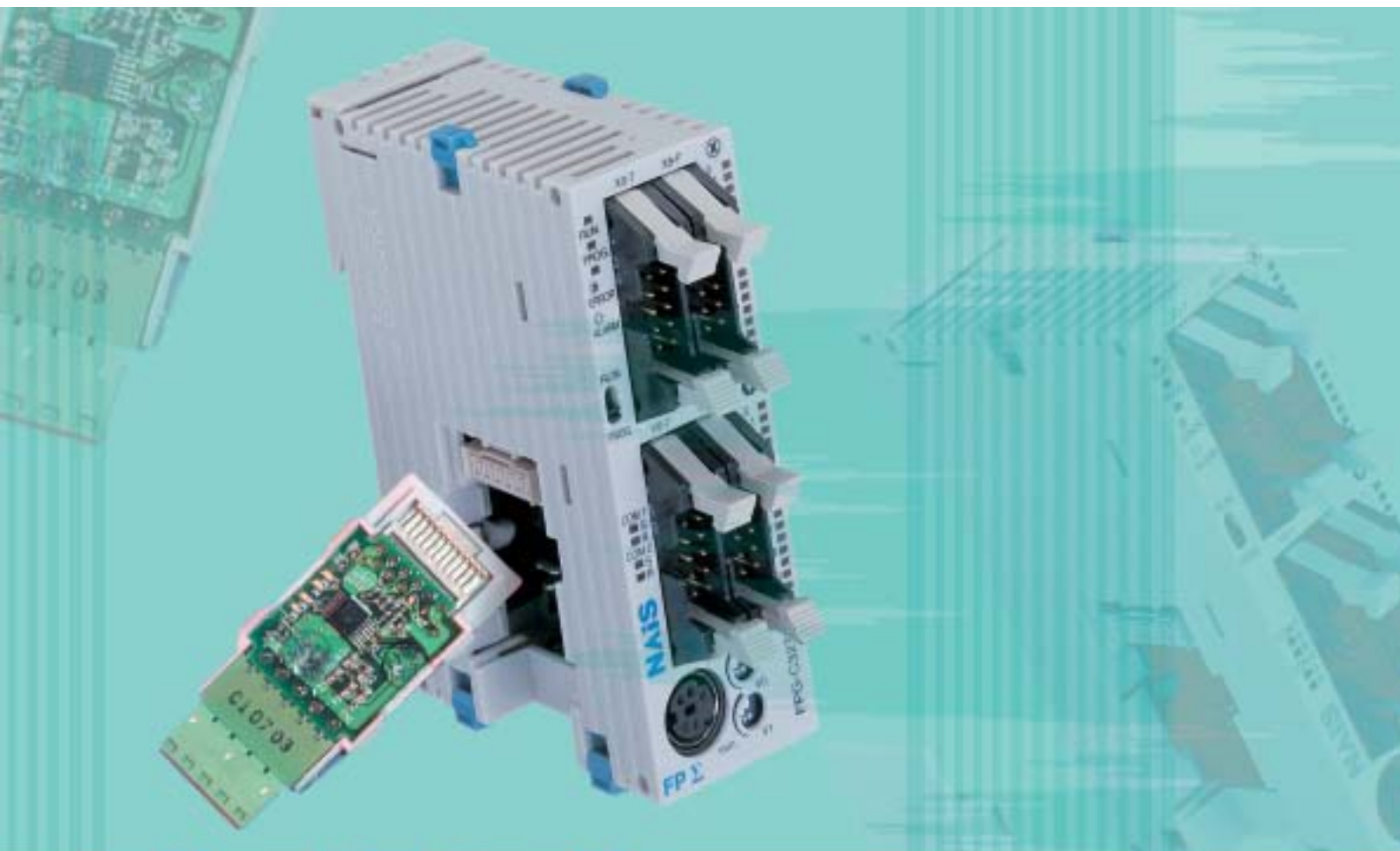


**Panasonic**  
ideas for life



Panasonic  
Programmable Controller FP $\Sigma$  (Sigma)

# FPΣ (Sigma)

## The next generation compact PLC

### Highlights

State-of-the-art PLC technology in the most compact size plus the ability to communicate via all important modern media characterize the FPΣ (Sigma). With its two 100kHz pulse outputs, four hardware counters that function at up to 50kHz for positioning applications, a programming memory capable of storing 12,000 steps, a real-time clock, and communication interfaces for RS232 and RS485, FPΣ (Sigma) is one of the most flexible PLCs on the market. Remarkably, it is also one of the smallest!

### Communication

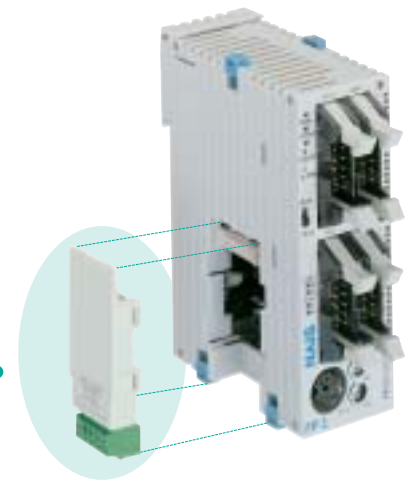
Four quick and easy snap-on cassettes are available to add different serial ports to the FPΣ (Sigma). All ports are capable of communicating at speeds of up to 115.2Kbps

1-channel RS232C type.

2-channel RS232C type.

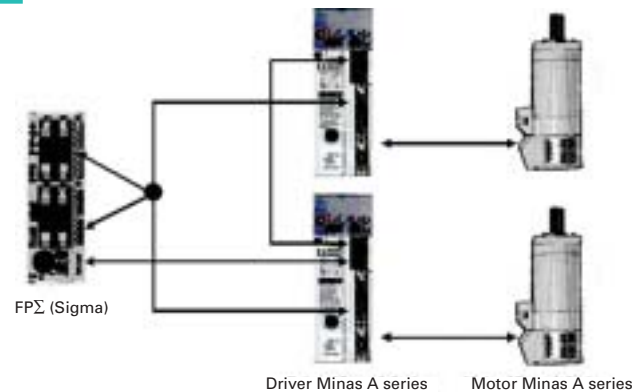
1-channel RS485 type.

1-channel RS232C + 1-channel RS485 type.



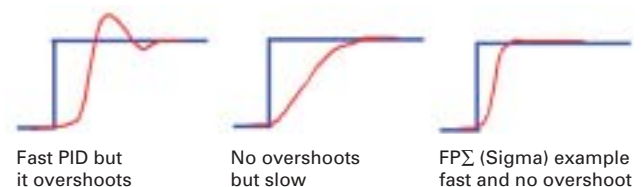
### Positioning

In addition to a host of handy Matsushita functions, the FPΣ (Sigma) also offers circular and linear interpolation. Circular interpolation can be used for applications that apply glue, linear interpolation for pick & place applications, for example. By combining the FPΣ (Sigma) with servo motors, you can perform real 2-axis motion control.



### Temperature Control

With the new thermocouple input units and our accurate unique PID and IPD algorithms, temperature can be controlled more easily and accurately than ever.



### Other Highlights

- High expansion capability with up to 384 I/Os
- Fastest processing time, 0.4μsec/basic command
- Compact design (W 30 x H 90 x D 60mm)
- Short circuit protected transistor outputs
- Built-in analogue volume with two points
- Backup battery

# FPΣ (Sigma) CPUs

Outstanding performance in a compact design

FPΣ (Sigma) – Transistor output type



28 points	
Input 16 points	Output PNP 12 points
Connector type FPG-C28P2	



32 points	
Input 16 points	Output NPN 16 points
Connector type FPG-C32T2	

FPΣ (Sigma)  
Relay output type



24 points	
Input 16 points	Output 8 points
Terminal type FPG-C24R2	

FPΣ (Sigma) – Transistor output type with thermistor input



28 points	
Input 16 points	Output 12 points
2 thermistor inputs FPG-C28P2TM	



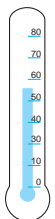
32 points	
Input 16 points	Output 16 points
2 thermistor inputs FPG-C32T2TM	

FPΣ (Sigma) – Relay  
output type with  
thermistor input



24 points	
Input 16 points	Output 8 points
2 thermistor inputs FPG-C24R2TM	

Temperature  
Control



## High Expansion Capability

FPΣ (Sigma) can use the expansion units of the FP0 on the right-hand side. New FPΣ (Sigma) units can be added to the left-hand side.

Max. 4 Expansion Units  
each 64 I/Os = 256 I/Os

...up to 384 I/O!

CPU  
max. 32 I/Os

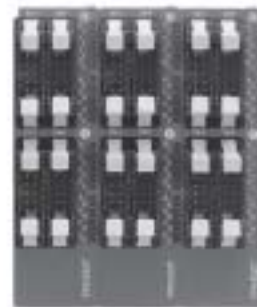
Max. 3 Expansion Units  
each 32 I/Os = 96 I/Os



Parallel  
Expansion  
BUS



Serial  
Expansion  
BUS



# FPΣ (Sigma) Expansion Units – Left Side Expansion

Wide variety of expansion units

FPΣ (Sigma)  
I/O Expansion Unit



<b>64 points</b>	
Input 32 points	Output (NPN) 32 points
Connector type FPG-XY64D2T	

FPΣ (Sigma)  
Memory Expansion Unit



<b>FPG-EM1</b>
Memory: 256K words FPG-EM1

## FPΣ (Sigma) Positioning Expansion Units



**1-axis**  
transistor output  
FPG-PP11



**1-axis**  
line driver output  
FPG-PP12



**2-axis**  
transistor output  
FPG-PP21



**2-axis**  
line driver output  
FPG-PP22

## Communication Cassettes



**1-channel**  
RS232C type  
FPG-COM1



**2-channel**  
RS232C type  
FPG-COM2



**1-channel**  
RS485 type  
FPG-COM3

**NEW**



**2-channel**  
RS232C & RS485 type  
FPG-COM4

## FP Memory Loader

- Read or write programs from or to a PLC
- Personal computer is not required.
- Applicable with FP0, FPΣ (Sigma), FP-M, FP2 and FP2SH



**AFP8670**

# FP0 Series

Choose the number of I/O points to suit the application

## DIGITAL I/O UNITS

### Relay output type



### Input only type



### Transistor output type



8 points		16 points		32 points		8 points		16 points		8 points		16 points		16 points		32 points	
Input 4 points	Output 4 points	Input 8 points	Output 8 points	Input 16 points	Output 16 points	Input 8 points	Input 16 points	Output 8 points	Input 8 points	Output 8 points	Output 16 points	Output 16 points	Input 16 points	Output 16 points	Input 16 points	Output 16 points	
FP0-E8RSA		FP0-E16RSA		FP0-E32RS		FP0-E8XA		FP0-E16XA		FP0-E8YPA (PNP) FP0-E8YTA (NPN)		FP0-E16YPA (PNP) FP0-E16YTA (NPN)		FP0-E16YPA (PNP) FP0-E16YTA (NPN)		FP0-E32YPA (PNP) FP0-E32YTA (NPN)	
<b>Option</b>																	
Output 8 points																	
FP0-E8YRSA																	

## ANALOGUE I/O UNITS



3 points		4 points		4 points		8 points		4 points		8 points		6 points		MEWNET-F FP0-IOL (MEWNET-F Slave)		CC-Link FP0-CCLS (CC-Link Slave)	
Input 2 points	Output 1 point	Output 4 points	Output 4 points	Output 4 points	Input 8 points	Input 4 points	Input 4 points	Input 8 points	Input 8 points	Input 8 points	Input 6 points						
FP0-A21A		FP0-A04I		FP0-A04V		FP0-A80A		FP0-TC4		FP0-TC8		FP0-RTD6					

- Input (12 bit): ± 10V, 0 – 5V, 0 – 20mA
- Output (12 bit): ± 10V, 0 – 20mA
- Input (12 bit): ± 10V, 0 – 5V, 0 – 20mA
- Output (12 bit): ± 10V, 0 – 20mA
- K, J, T, R type thermocouples can be used
- Resolution: 0.1°C
- Accuracy: 0.8°C (R type: 3°C)
- Temperature range: -100 to 1500°C
- Pt100, Pt1000, NI1000
- Temperature range: -200 to 500°C

## AC Power Supply

### FP0-PSA2



Input 85 to 265VAC	Input 85 to 265VAC
Terminal type	

The FP0 power supply unit offers stable 24VDC for a wide range of industrial and home applications.

#### Highlights:

- Small size of only 90 x 30.4 x 60mm
- DIN-rail mounting
- Optimal protection e.g. overvoltage, overcurrent, overheating, etc.
- Maximum output current of 0.7A
- Robust, suited for industrial environment

# FPΣ (Sigma)

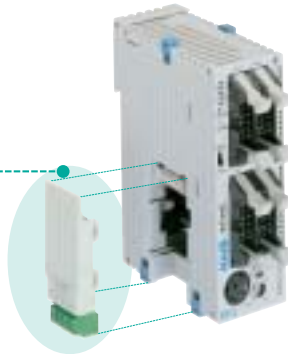
## Optimised communication functions

1-channel RS232C type.

2-channel RS232C type.

1-channel RS485 type.

**NEW** 1-channel RS232C + 1-channel RS485 type.



Four types of communication cassettes enable:

- efficient connection to serial devices
- transmission speeds of up to 115.2Kbits/s
- long transmission distance of up to 1200m

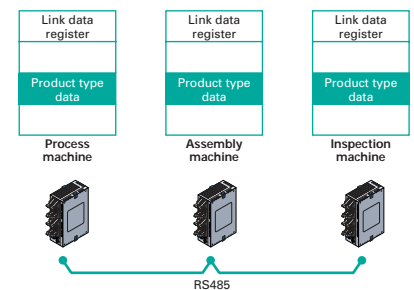
In addition, the green screw terminal is removable for easy wiring.

With the RS485 type communication cassette...

### Despite being compact you can create powerful PLC links!

More links than you imagined a compact PLC could achieve  
(1,024 link relays / 128-word link data registers)

- Can be used to share product type between different machines
- Can be used for interlocking between different machines
- Easy wiring between PLCs with twin-core cabling



### Masterless communication method

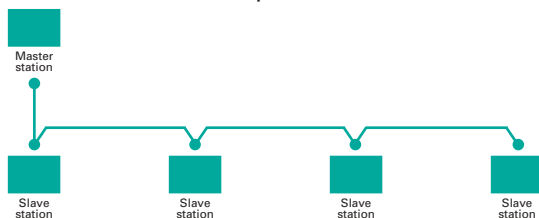
(when PLC linkage is achieved with link relays and link data registers)

The masterless communication method means that even if a connected device (station) goes into power off, operations to automatically switch the master station continue. Start up is smooth and the recovery from malfunctions is also potentially faster.

#### Previous models

Usual master-slave communication

- If the master station is not on communication cannot take place.
- Errors occur when devices are not turned on in sequence.



#### With the FPΣ (Sigma)

Masterless communication using the FPΣ

- Even if a station goes into a power-off state, communications between the other stations continue.



### Use of insulated RS485

Uses the insulated RS485, which is highly reliable and largely impervious to noise. High-speed communication over long distances are enabled.

■ Transmission speed: Max. 115.2k bits/s

■ Transmission distance: Max. 1,200m

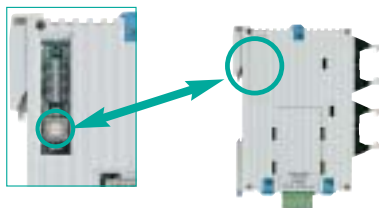
# FPΣ (Sigma)

## Optimised communication functions

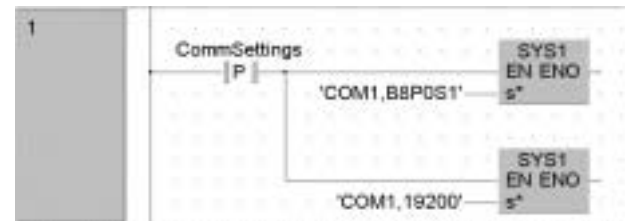
**Convenient station no. setting function enables flexible use, even when there are product type changes.**

- Station no. switchability allows the use of unified programming and program switching.
- Because even the communications parameters can be changed in the program, connection is enabled with external devices that have different communication parameters.

FPΣ (Sigma) Station No. setting switch



Communication parameters changed by instructions



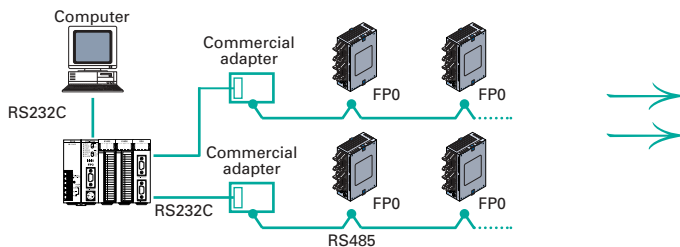
**Great for these applications, too...**

Computer linkage with up to 99 stations enabled (max. 32 stations when using C-NET adapter)

- Ability to gather data from multiple stations means greater design freedom.

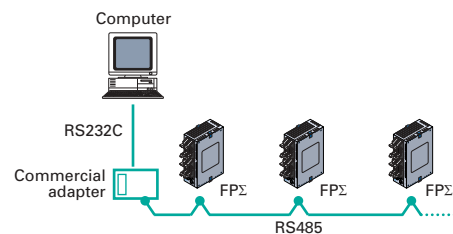
### Previous models

Relay stations required for linking medium-scale PLCs



### With the FPΣ (Sigma)

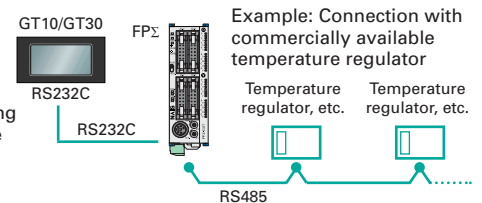
Computer linkage with up to 99 stations



**Can also be connected to external devices that are equipped with RS485 interface**

- Enables connection to external devices, such as temperature regulators, that are equipped with RS485 interface
- Applicable with data gathering or setting adjustment

- Control is possible using commercially available RS485 devices.



Example: Connection with commercially available temperature regulator

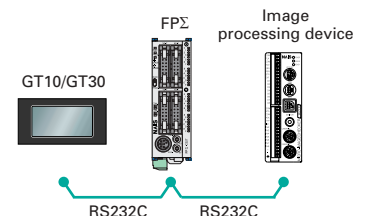
Temperature regulator, etc. Temperature regulator, etc.

**With the RS232C type communications cassette**

Efficient connection with other control devices helps to save space!

- Enables connection to devices with RS232C interface, such as a programmable display panel, image processing device and other devices.
- When used as a tool port, up to 3 external devices can be connected.

- A 2-channel type communication cassette is used.



# FPΣ (Sigma) Positioning

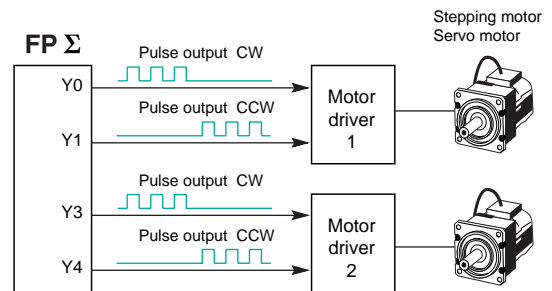
Specially designed for positioning applications

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

## Pulse output max. 100kHz

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

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

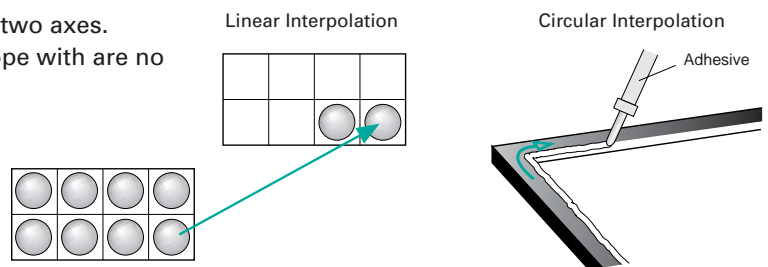


## Rapid 0.02ms start (when JOG operation controls are executed)

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

## Linear interpolation and circular interpolation are built in (FPG-C32T2 and FPG-C28P2)

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

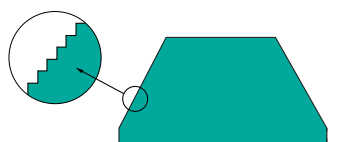


## And there's more...

### Smooth acceleration/deceleration

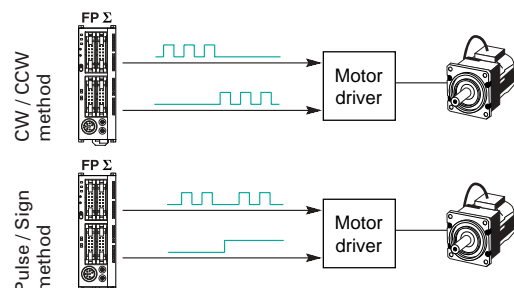
You can choose to set either 30 or 60 steps of acceleration/deceleration. This feature means you can achieve smoother movement during long acceleration/deceleration periods of stepping motors.

The settings are there for a maximum 60 acceleration/deceleration steps.



### Support for CW/CCW method

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





# FPΣ (Sigma) Positioning

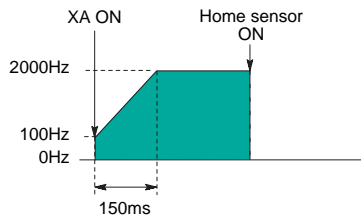
## High-speed, high precision positioning

### Programming with convenient and easy-to-understand instructions

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

### Home position return

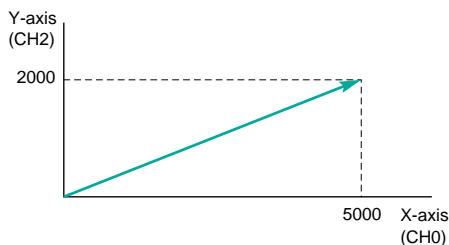
- Pulse output diagram (when the home position proximity input is not used)



Home search automatically reverses the motor rotation when Over limit input(+) or Over limit input (-) is input and their searches for the home position or near home position in order to return to it automatically.

### Linear interpolation

- Positioning locus



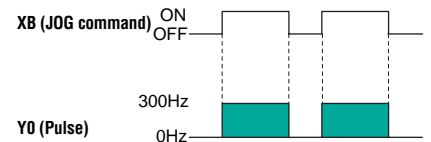
A control function that automatically defines the continuum of points in a straight line based on only two co-ordinate positions.

### Selectable home return mode

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

### JOG operation

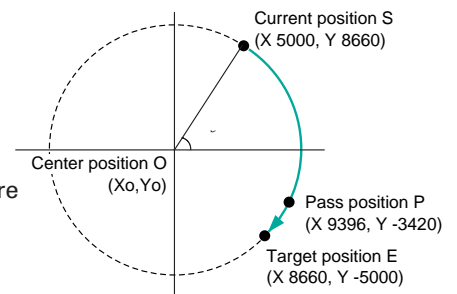
- Pulse output diagram



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

### Circular interpolation

- Positioning locus



- Center-radial setting methods are also available

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

# FPΣ (Sigma) Positioning Expansion Units

## Precise positioning

### Features

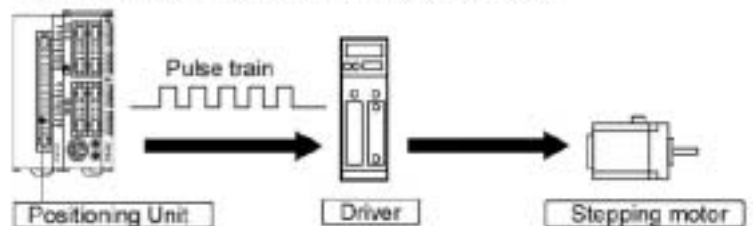
- Fast startup of 0.02 or 0.005ms makes cycle time reduction possible
- Feedback pulse count function makes output pulse counting from external encoders possible
- JOG positioning control supports a wide range of applications
- 4 types of S-curve acceleration/ deceleration control makes smooth startup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



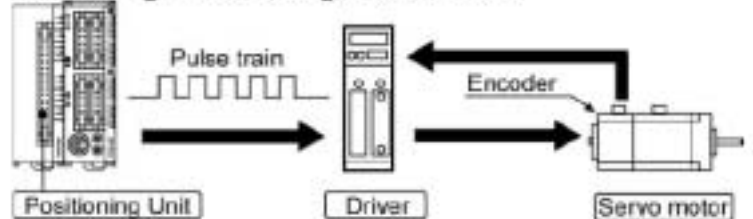
- The FPΣ (Sigma) positioning unit can handle simultaneous startup of multiple axes, enabling simultaneous control of linear interpolation and other elements through user programs.
- Transistor output type (open collector) and line driver output type are available.

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

### Positioning control using a stepping motor



### Positioning control using a servo motor



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

# FPΣ (Sigma) Data Memory Expansion Unit

Data capacity expandable up to 256k words

## Features

- Able to store 256k words, this memory unit is well-suited for storing remote monitoring logs.
- Take advantage of FPΣ's memory for manufacturing systems that produce more than one model. With FPΣ's memory, you no longer need to download new production data every time you switch manufacture process.
- Up to 4 units can be connected to the FPΣ, allowing up to 1024k words to be stored.



FPG-EM1



## General Specifications

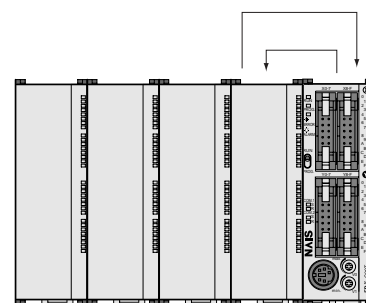
Item	Description
Ambient temperature/humidity	0 to 55°C, 30 to 85% RH (No condensation)
Storage temperature/humidity	-20 to +70°C, 30 to 85% RH (No condensation)
Vibration resistance	10 to 55Hz, 1 sweep/min., double amplitude of 0.75mm, 10min. on 3 axes
Shock resistance	98m/s <sup>2</sup> or more, 4 times on 3 axes
Noise immunity	1,000V (P-P) with pulse width 50ns, 1μs (using a noise simulator)
Operating condition	Must be free from corrosive gases and excessive dust
Basic unit mass	Approx. 80g
The amount of increase in control unit consumption current	35mA or less (24VDC) (100mA or less (internal 5VDC))

## Performance Specifications

Item	Description
Memory capacity	256 kilowords (1 kiloword × 256)
Battery life	5 years or more
5V Power consumption	100mA or less
Number of I/O points	Input 16 points

## Programming tool FPWINGR/FPWIN Pro

Instructions F150 and F151 are necessary for reading from and writing to memory expansion units. You can use these instructions with FPWINGR Vers. 2.13 or later or FPWIN Pro Vers. 4.02 or later.



Data is read with the F150 instruction.

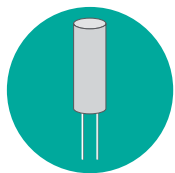
Data is written with the F151 instruction.

# Optimised Temperature Control

Functions convenient for temperature control are built in

## The control unit with thermistor inputs enables temperature control at low cost

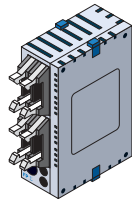
Two thermistor inputs, which cost less than thermocouples, can be connected to the FPΣ (Sigma) unit via thermistor inputs (FPG-C28P2TM, FPG-C32T2TM and FPG-C24R2TM)



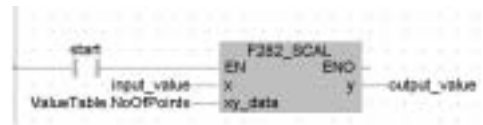
Thermistor



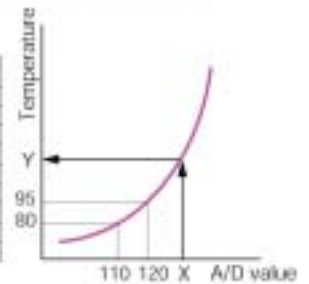
FPΣ control unit that accepts thermistors



Using a simple linearization command, measuring the temperature by the thermistor can be programmed easily.



Value	Description
10	No. of reference points
110	1 <sup>st</sup> reference x point
120	2 <sup>nd</sup> reference x point
*	*
*	*
80	1 <sup>st</sup> reference y point
85	2 <sup>nd</sup> reference y point
*	*
*	*

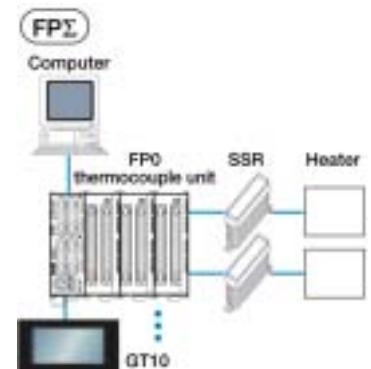


## Four- and eight-channel type thermocouple input expansion unit

Up to three units can be added to each control unit, enabling temperature control of up to 24 channels.

Advantages over multiple temperature controllers:

- Information collection and computer-based storage
- On-site error monitoring using programmable display
- Significant reduction in total costs
- Power supply stabilisation by protecting synchronisation between heater ON and OFF states
- Temperature settings can be easily changed using batch function

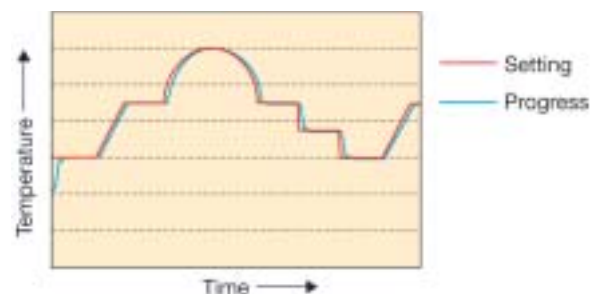


## Optimised temperature control with PID and PWM instruction

You can easily set multi-stage temperature control and time control usually available only in high performance type temperature controllers.

With the built-in PID and IPD algorithms, temperature can be controlled more accurate than ever.

Example of temperature control with the auto-tuning function only



# FPΣ (Sigma)

## Specification tables

PERFORMANCE SPECIFICATIONS			
Item	Description		
Type of control unit	Transistor output type		Relay output type
Part number	FPG-C32T2	FPG-C28P2	FPG-C24R2
Program- /Control method	Relay symbol/Cyclic operation		
Number of I/O points			
No expansion	32 (Input: 16 / Output: 16)	28 (Input: 16 / Output:12)	24 (Input: 16 / Output: 8)
with expansion	Max. 384	Max. 380	Max. 376
Program memory	Built-in Flash ROM		
Program capacity	12,000 steps		
Kinds of instruction			
Basic	85		
High-level	220		
Operation speed	0.4 μs- /step, Basic instructions		
Memory for execution			
External input (X)	1184 points		
External output (Y)	1184 points		
Internal relay (R)	1568 points (R0-R97F)		
Timer/Counter (T/C)	1024 points <sup>1, 2</sup> / At reset: timer 1008 points, T0-T1007 counter 16 points, C1008-C1023 / Timer range is selected by instructions from 1ms, 100ms, 1s / Counter: 1 to 32767 counts		
Link relay (L)	1024 points <sup>1</sup>		
Data register (DT)	32765 words (DT0-DT32764) <sup>1</sup>		
Link data register (LD)	128 words <sup>1</sup>		
Index register (I)	14 words (I0-ID)		
Differential points	Unlimited number of points		
Master control relay points	256 points		
Labels (JP+LOOP)	256 labels		
Number of step ladder	1000 stages		
Number of subroutine	100 subroutine		
Pulse catch input	8 points (X0-X7)		
Interrupt program	9 programs (external 8 points, 1 periodical interrupt point 0.5ms - 30s)		
Self-diagnosis functions	Watchdog timer, program syntax checking, etc.		
Clock/Calendar function	Year, month, day, hour, minute, second, and day of week <sup>4</sup>		
Volume input	2 points resolving power 10bits (K0-K1000)		
Link functions	Computer link (1:1, 1:N) <sup>3, 4</sup> General communication (1:1, 1:N) <sup>3, 4</sup> PLC link <sup>5</sup>		
Battery-life (Battery is optional)	Min. 220 days (typical 840 days) at 25°C		
Other functions	Program edition during run, constant scan, forced I/O, password, floating point real number operation, PID processing instruction Comment memory 128K byte		

Notes: 1) If a battery is not used, only fixed area is backed up (Counter: C1008-C1023, internal relay: R900-R97F, Data register: DT32710-DT32764). If a battery is used, backup is possible: Area-setting of hold or no-hold is possible by system register.

2) Points can be increased using auxiliary timer.

3) Optional communication cassette (RS232C type) is necessary for 1:1 communication.

4) Optional communication cassette (RS485 type) is necessary for 1:N communication.

5) Optional communication cassette (RS485 type) is necessary.

6) Optional battery is necessary in order to use Clock/Calendar function. Precision calendar timer: at 25°C = 77°F less than 51-second error per month / at 0°C = 32°F less than 119-second error per month / at 55°C = 131°F less than 148-second error per month

### GENERAL SPECIFICATIONS

Rated operating voltage	24VDC	Shock resistance	98m/s <sup>2</sup> or more, 4 times on 3 axes
Operating voltage range	21.6 to 26.4VDC		
Allowable no voltage time	4ms (at 21.6V), 10ms (at 26.4V)		
Ambient temperature	0°C to +55°C	Noise humidity	1,000V (p-p) with pulse widths 50ns and 1 μs
Storage temperature	-20°C to +70°C		
Ambient humidity	30 to 85% RH (Non-condensing)	Operating condition	free from corrosive gasses and excessive dust
Storage humidity	30 to 85% RH (Non-condensing)		
Vibration resistance	10 to 55Hz, 1 cycle/min., double amplitude of 0.75mm, 10min. on 3 axes		

# FPΣ (Sigma)

## Specification tables

<b>INPUT SPECIFICATIONS *</b>	
Insulation method	Optical coupler
Rated input voltage	24VDC
Input voltage range	21.6 to 26.4VDC
Rated input current	Approx. 3.5mA - 8mA depends on input no.
Input points per common	8 points/common (FPG-C24), 16 points/common (FPG-C32/C28), 32 points/common (FPG-XY64D2T). Either the positive or negative of input power supply can be connected to terminal
Min. ON voltage / Max. OFF current	19.2V / 3mA - 6mA depends on input no.
Max. ON voltage / Min. OFF current	2.4V / 1.3mA
Input impedance	3k - 6.8kΩ depends on input no.
Response time	CPU: 1ms or less, 5μs (HSC, pulse catch, interrupt input) Expansion: 0.2ms (OFF -> ON) 0.3ms (ON -> OFF)
Operating indicator	LED
<b>OUTPUT – transistor output type *</b>	
Insulation method	Optical coupler
Output method	Open collector
Rated voltage range	5 to 24VDC
Load voltage range	4.75 to 26.4VDC
Max. load current	FPG-C32: 12x0.1A+4x0.3A; FPG-C28: 12x0.3A+4x0.5A; Expansion unit: 0.1A
Output points per common	C32T2: 16 points, C28P2: 12 points, XY64D2T: 32 points
Response time	OFF->ON: 0.2ms or less (min. 2μs: 4 outputs) ON->OFF: 0.5ms or less (min. 8μs: 4 outputs)
Power supply for driving internal circuit	Voltage: 21.6 to 26.4VDC
Operating indicator	LED
Protection	Short circuit protection, thermal protection (Y0, Y1, Y3, Y4 no protection)
<b>OUTPUT – relay output type *</b>	
Output type	Normally open (1 Form A)
Rated control capacity	2A 250VAC, 2A 30VDC (max. 4.5A / common)
Response time	OFF->ON: 10ms or less ON->OFF: 8ms or less
Life	Mechanical: 20 million operations or more Electrical: 100k operations or more
Surge absorber	none
Operating indicator	LED

Notes: \*) for details please refer to the FPΣ (Sigma) manual.

### SOFTWARE PROGRAMMING AND SUITABLE CABLE

Type of software	Version description	Part number
<b>FPWIN Pro:</b> Object oriented high level IEC1131 software. Supports all five IEC61131 languages: Structured Text, Function Block Diagram, Sequential Function Chart, Ladder Diagram, Instruction List. Multi languages menu: English, French, German, Italian, Spanish	Full version, supports all FP Series PLCs	FPWINPROF-EN4
	Small version, supports FP-e, FP0, FP1, FP-M, FPΣ (Sigma)	FPWINPROS-EN4
<b>FPWIN GR:</b> Quick way to program ladder logic. Customizable short cut keys and private configuration settings make programming faster and less stressful. Version 2 supports FPΣ Sigma and a lot of new features, language menu: English, Italian, Spanish	Full version, supports all FP Series PLCs	FPWINGRF2
Programming Cable	PC to the PLC TOOL port, 3m	AFC8513D

# FPΣ (Sigma) Product Overview

## Part numbers

### FPΣ (SIGMA) CONTROL UNITS

Product Name	Part Number
FPΣ C28 CPU, 16 inputs, 12 outputs (transistor PNP)	FPG-C28P2
FPΣ C32 CPU, 16 inputs, 16 outputs (transistor NPN)	FPG-C32T2
FPΣ C24 CPU, 16 inputs, 8 outputs (relay)	FPG-C24R2
FPΣ C28 CPU, 16 inputs (+ 2 thermistor inputs) , 12 outputs (transistor PNP)	FPGC28-P2TM
FPΣ C32 CPU, 16 inputs (+ 2 thermistor inputs) , 16 outputs (transistor NPN)	FPG-C32T2TM
FPΣ C24 CPU, 16 inputs (+ 2 thermistor inputs), 8 outputs (relay)	FPG-C24R2TM

### FPΣ (SIGMA) EXPANSION UNITS (LEFT SIDE EXPANSION)

Product Name	Part Number
FPΣ 64-points I/O Expansion Unit, 32 inputs, 32 outputs (transistor NPN)	FPG-XY64D2T
FPΣ Memory Expansion Unit, 256K words	FPG-EM1
FPΣ Positioning Expansion Unit, 1 axis type, transistor output	FPG-PP11
FPΣ Positioning Expansion Unit, 1 axis type, line driver output	FPG-PP12
FPΣ Positioning Expansion Unit, 2 axes type, transistor output	FPG-PP21
FPΣ Positioning Expansion Unit, 2 axes type, line driver output	FPG-PP22

### FPΣ (SIGMA) ACCESSORIES

Product Name	Part Number
FPΣ 1 channel, RS232C type communication cassette	FPG-COM1
FPΣ 2 channels, RS232C type communication cassette	FPG-COM2
FPΣ 1 channel, RS485 type communication cassette	FPG-COM3
FPΣ 2 channels, RS232C & RS485 type communication cassette	FPG-COM4
FPΣ power supply cable, 1m	AFPG805
FPΣ battery, for memory backup & clock functions	AFPG804
FP Memory Loader, for transfer of programs without a PC or memory unit	AFP8670

### FP0 EXPANSION UNITS (RIGHT SIDE EXPANSION)

Product Name	Part Number
FP0-E8RS, 4 inputs, 4 outputs (relay)	FP0-E8RSA
FP0-E8X, 8 inputs	FP0-E8XA
FP0-E8YP, 8 outputs (transistor PNP)	FP0-E8YP
FP0-E8YT, 8 outputs (transistor NPN)	FP0-E8YT
FP0-E16RS, 8 inputs, 8 outputs (relay)	FP0-E16RSA
FP0-E16P, 8 inputs, 8 outputs (transistor, PNP)	FP0-E16P
FP0-E16T, 8 inputs, 8 outputs (transistor, NPN)	FP0-E16TA
FP0-E16X, 16 inputs	FP0-E16XA
FP0-E16YP, 16 outputs (transistor PNP)	FP0-E16YP
FP0-E16YT, 16 outputs (transistor NPN)	FP0-E16YT
FP0-E32P, 16 inputs, 16 outputs (transistor, PNP)	FP0-E32PA
FP0-E32T, 16 inputs, 16 outputs (transistor, NPN)	FP0-E32TA
FP0-A21A, 2 analogue inputs, 1 analogue output	FP0-A21A
FP0-A80A, 8 analogue inputs	FP0-A80A
FP0 thermocouple unit, 4 inputs	FP0-TC4
FP0 thermocouple unit, 8 inputs	FP0-TC8
FP0 PROFIBUS DP slave or remote I/O unit	FP0-DPS2

### AC POWER SUPPLY

Product Name	Part Number
FP0 AC power supply, 24VDC, 0.7A	FP0-PSA2



North America	Europe	Asia Pacific	China	Japan
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