Panasonic
ideas for life

Programmable Controller
FPΣ Positioning Unit RTEX
FP2 Positioning Unit RTEX

Realtime Express
Support for MINAS Network Servo A4N [*1]
Simplifies multi-axis high precision positioning

High Speed Communication 100Mbps!

- ■ As a world first [*2], allows easy control of network servos with an ultra-compact PLC.
- ■ Allows highly accurate control of multi-axis positioning using high speed 100Mbps communications.
- ■ Great reduction in wiring costs with the use of commercial LAN cables.
- ■ New product lineup with the introduction of a 2-axis unit in addition to the 4-axis and 8-axis units.
- ■ Total support from configuration and startup through to monitoring with the dedicated software tool ConfiguratorPM.
- ■ Includes manual pulser input, allowing support for precision teaching.

*1 Realtime Express and MINAS A4N are trademarks and product names of Matsushita Electric Industrial, Co., Ltd.   *2 As of July, 2006.

Easy construction of multi-axis servo system in a network with minimal wiring. Positioning unit with MINAS (Realtime Express) (*1) support.
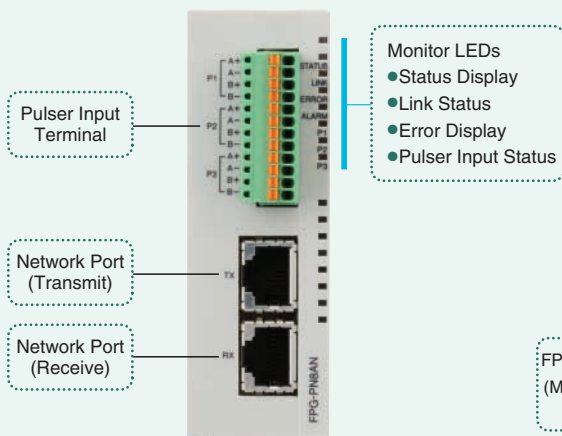
*1 Matsushita Electric Industrial network servo systems

Introducing the FPΣ Positioning Unit RTEX, the world's first (*2) with ultra-compact PLC! Perfect as a space-saving, low-cost networked servo controller.
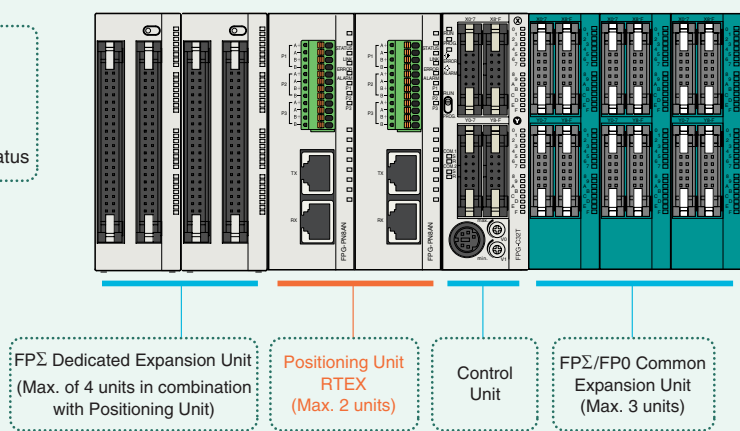
- Maximum control axes: 16 axes. Realization of highly accurate 2-axis circular interpolation, 3-axis linear interpolation and 3-axis spiral interpolation with high-speed 100Mbps communication.
- With 3 types in the product range for 2-axes, 4-axes and 8-axes, provides flexible support even for control from small numbers of axes.
- Naturally, also provides a rich environment for total control of equipment including I/O control, with a powerful control unit with 32K step program capacity/ max. 320 I/O points/ serial communication on 3 ports.

*2 As of July 1, 2006.
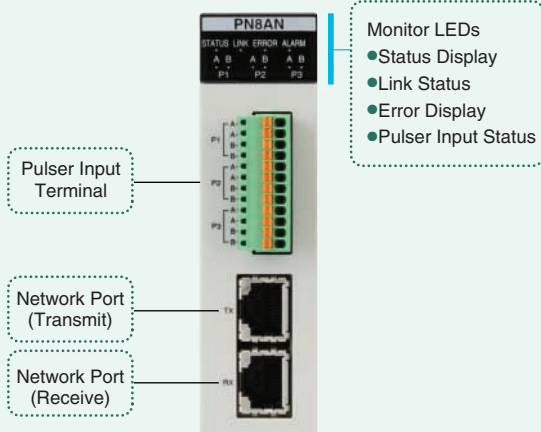
FPΣ Positioning Unit RTEX

Pulser Input Terminal

Monitor LEDs
- Status Display
- Link Status
- Error Display
- Pulser Input Status

Network Port (Transmit)

Network Port (Receive)

Example Configuration: 16 axes + I/O (256 points)

FPΣ Dedicated Expansion Unit (Max. of 4 units in combination with Positioning Unit)

Positioning Unit RTEX (Max. 2 units)

Control Unit
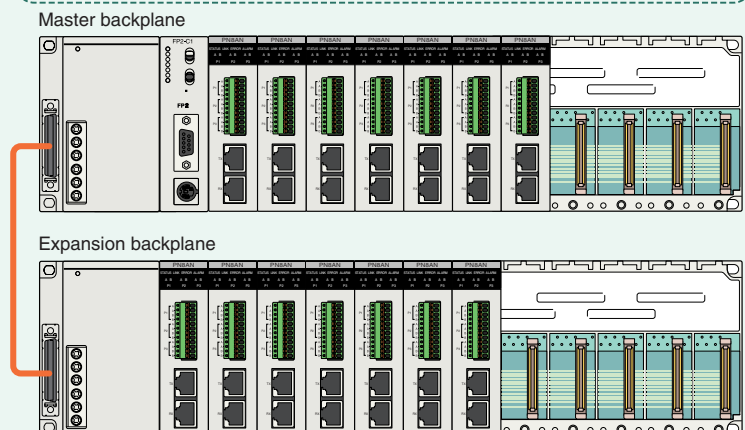
FPΣ/FP0 Common Expansion Unit (Max. 3 units)

Released simultaneously with unit for ultra-high speed processing with FP2/FP2SH. Maximum control axes: 112 axes! Sufficient support for large-scale equipment.

- Up to 14 units with 8-axes type installation is possible, the number of control axis becomes 112.
- With the addition of a 2-axis unit to the product lineup, the same as with FPΣ, provides flexible support for system configurations from small to large numbers of axes.
- In combination with the ultra-high speed & large capacity FP2SH CPU unit (20K steps/1ms (as measured in in-house experiments) and 120K step program capacity), provides sufficient support for even large-scale equipment.

FP2 Positioning Unit RTEX

PN8AN

Monitor LEDs
- Status Display
- Link Status
- Error Display
- Pulser Input Status

Pulser Input Terminal

Network Port (Transmit)

Network Port (Receive)

Example Configuration: 8 axes x 14 units = 112 axes (max. no. of control axes)

Master backplane

Expansion backplane

Product Lineup

● Product lineup of 2-axis, 4-axis and 8-axis units for both FPΣ and FP2/FP2SH, providing flexible support for small to large number of control axes.

Positioning Unit RTEX

FPΣ Positioning Unit RTEX

2 axes unit	FPG-PN2AN	(AFPG43610)
4 axes unit	FPG-PN4AN	(AFPG43620)
8 axes unit	FPG-PN8AN	(AFPG43630)

FP2 Positioning Unit RTEX

2 axes unit	FP2-PN2AN	(AFP243610)
4 axes unit	FP2-PN4AN	(AFP243620)
8 axes unit	FP2-PN8AN	(AFP243630)

Panasonic Control Configurator PM

Dedicated software tool Configurator PM
AFPS66510 (English)

Support Control Unit CPU Unit
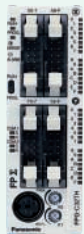
FPΣ Control Unit

C32 (NPN Transistor Output)	Left-side expansion type	FPG-C32T2H
C28 (PNP Transistor Output)	Left-side expansion type	FPG-C28P2H
C24 (Relay Output)	Left-side expansion type	FPG-C24R2H
C32 (NPN Transistor Output)	Left-side expansion type with thermistor input	FPG-C32T2HTM
C28 (PNP Transistor Output)	Left-side expansion type with thermistor input	FPG-C28P2HTM
C24 (Relay Output)	Left-side expansion type with thermistor input	FPG-C24R2HTM

FP2 CPU Unit

Standard type	16K Steps	FP2-C1
With 64 point input	16K Steps	FP2-C1D
With S-LINK	16K Steps	FP2-C1SL

FP2SH CPU Unit

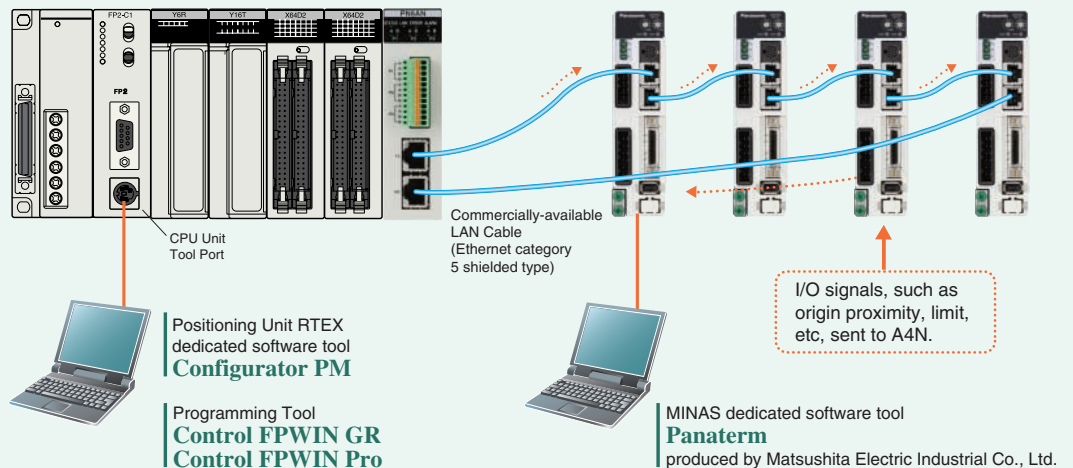|		
Standard type	60K Steps	FP2-C2
Small PC card support	60K Steps	FP2-C2P
Small PC card support	120K Steps	FP2-C3P

System Configuration

No. of Units Installable in Positioning Unit RTEX

FPΣ: 2 units
FP2: 14 units (limited by consumption current)

Control of 2 to 8 axes possible in one positioning unit.

Note: Servo Amp
MINAS A4N
produced by Matsushita Electric Industrial Co., Ltd.

CPU Unit Tool Port

Commercially-available LAN Cable (Ethernet category 5 shielded type)

I/O signals, such as origin proximity, limit, etc, sent to A4N.

Positioning Unit RTEX dedicated software tool
Configurator PM

Programming Tool
Control FPWIN GR
Control FPWIN Pro

MINAS dedicated software tool
Panaterm
produced by Matsushita Electric Industrial Co., Ltd.

Broad reduction in wiring costs.
High reliability and further reduction in wiring with advanced wiring method.
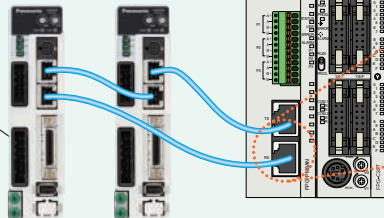
Commercially-available LAN cable used. Significant advantages in terms of cost efficiency and availability.

● Realtime Express* uses commercially-available LAN cable as the wiring for its network.
This provides outstanding advantages in terms of cost efficiency, availability and workability in regard to the wiring of the network.

*1 Matsushita Electric Industrial network servo systems

Servo Amp
MINAS A4N
produced by Matsushita
Electric Industrial Co., Ltd.

Commercially-available LAN Cable
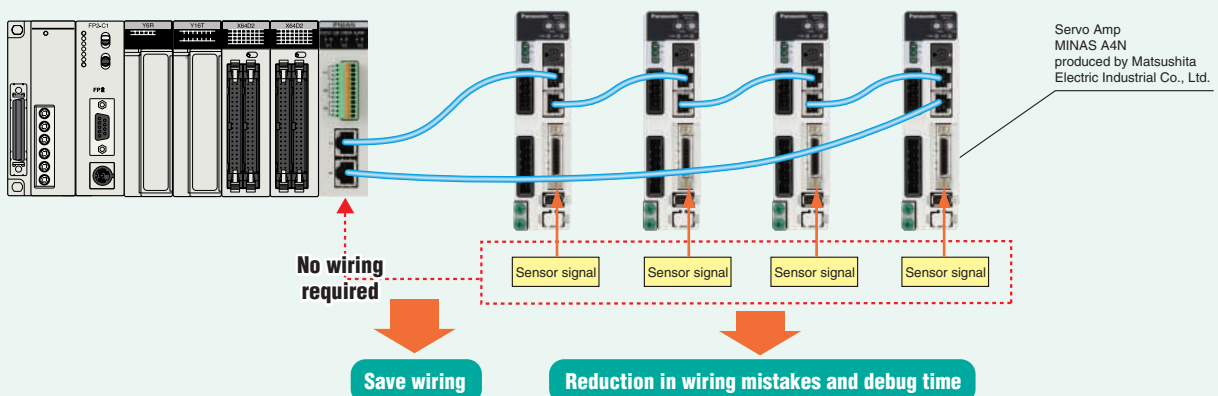(Ethernet category 5 shielded type)

Achievement of high reliability in regard to environmental conditions with loop wiring.

● Due to the fact that transmitted data and received data in serial communication are sent and received at frequent intervals in the same cable, the communication state is normally extremely sensitive to environmental conditions such as noise. However, by using loop wiring as shown in the figure below, Realtime Express creates smooth communication conditions with the data flow always in one direction, and is therefore able to secure high reliability. In addition, making the most of the 100Mbps high communication speed, Realtime Express reads the data transmissions occurring every 0.5ms twice and carries out sure data transfer in the extremely short period of 1ms, further improving reliability.

Servo Amp
MINAS A4N
produced by Matsushita
Electric Industrial Co., Ltd.

Data Communication Flow
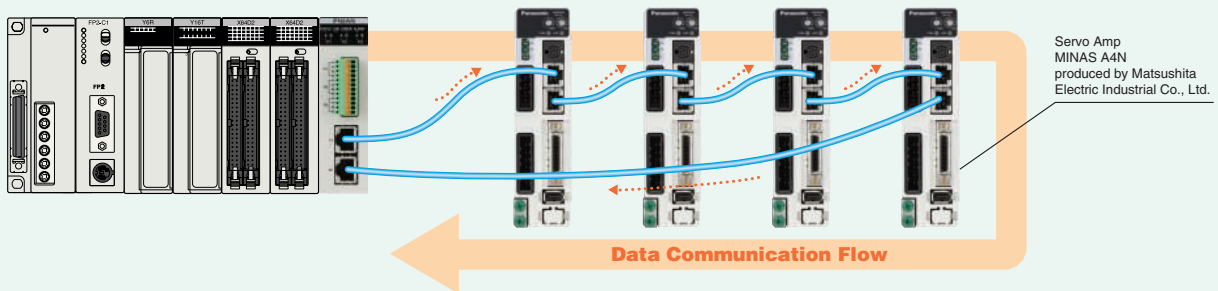
Sensor input (origin proximity, limit) is wired directly to the servo amp.
True reduction in wiring is achieved by communications between the positioning unit and servo amp being carried on 2 communication cables only.
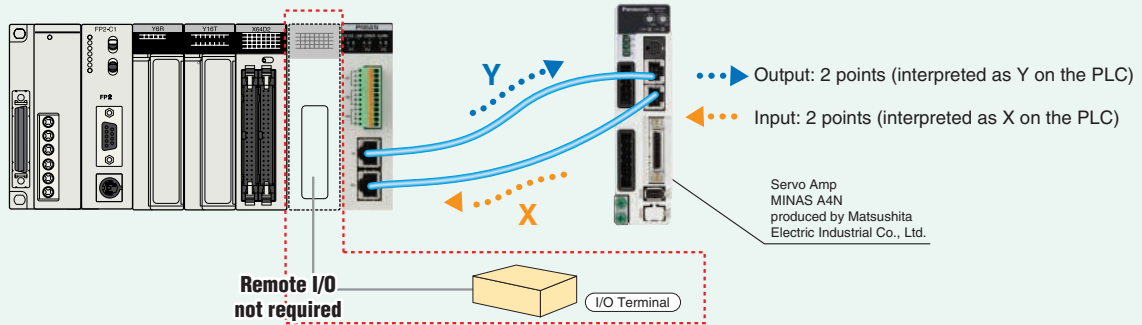
● Sensor input is wired directly to the servo amp of each axis and the signal is transferred to the positioning unit over the network. In this way, which sensor input relates to which axis can be checked at a glance, reducing wiring errors and shortening the time required for debugging, especially when the system deals with large numbers of axes. In addition, even if the positioning unit and servo amp are far apart, there is no need to wire the signal from a sensor which is close to the servo amp to the distant positioning unit, further contributing to a reduction in wiring.

Servo Amp
MINAS A4N
produced by Matsushita
Electric Industrial Co., Ltd.

No wiring required

Sensor signal | Sensor signal | Sensor signal | Sensor signal

Save wiring

Reduction in wiring mistakes and debug time

Further cost reductions

Remote I/O system not required due to 4 point general-purpose input/outputs installed in servo amp.

● The servo amp is equipped with DC input: 2 points/DC output: 2 points, which are sent via the network and interpreted in the PLC as X and Y values for each. The various sensor signal inputs and lamp illumination outputs, etc. local to the control axis can be controlled on the PLC, leading to a reduction in the cost required for the addition of remote I/O systems.

Y ▶ Output: 2 points (interpreted as Y on the PLC)

◀ Input: 2 points (interpreted as X on the PLC)

X

Servo Amp
MINAS A4N
produced by Matsushita
Electric Industrial Co., Ltd.

Remote I/O not required

I/O Terminal

Functions

■ Operating Patterns

● E Point Trapezoidal Control (PTP Control)

● P Point Change Speed Control (CP Control)

● C Point Repeated Trapezoidal Control (PTP Control)

■ Control Methods

● Absolute method, Increment method

■ Movement Unit Settings

● Pulse (pulse), scale (μm, inch), angle (degree)

■ Acceleration/Deceleration Method

● Linear, S-curve

■ Origin Return

● Origin proximity (DOG) Search Method

■ Low Speed Test Operation Mode (Speed Setting)

● The acceleration/deceleration time and target speed for each point indicated in the data table can be set to a low speed in the range of 1 to 100% without actually changing the data itself. Test operations can be carried out in safety by checking the operation of the device at low speed.

■ Interpolation Operation Modes

● 2-axis circular, 2-axis linear
● 3-axis spiral, 3-axis linear

■ Auxiliary Output

● Codes can be output during operation according to the data table No.

■ JOG Operation

● Speed and acceleration/deceleration time can be changed during operation.

■ Pulser Input

● 2-phase quad edge - Max. 1Mpps
● Division ratio setting possible by specification of numerator/denominator

# Dedicated Software Tool ConfiguratorPM
Simple and full support from configuration and startup to operation monitoring.

ConfiguratorPM

● ConfiguratorPM provides powerful yet simple full support from configuration settings (axis settings, parameter settings, data table creation, JOG operation, origin return, data monitor settings, etc.) and startup to operation monitoring, and contributes in reducing the time and man-hours required for system setup.

Axis Settings

Check the axis to be used.
Select axis No. used.
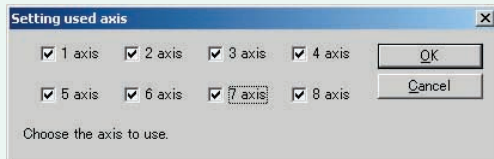
Grouping of axes for interpolation operations is carried out simply by dragging and dropping the relevant axes.
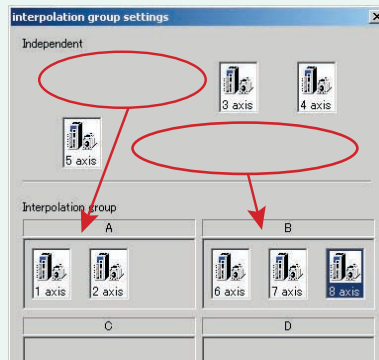
Parameter Settings

The details of settings can be displayed in a table.
Details on how to make settings for each category are explained in the box below.

Parameters can be copied between axes.
In cases where many settings are shared between axes, this can reduce the number of repeated
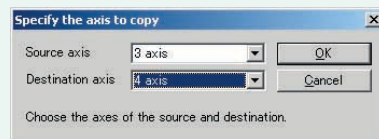
Data Table Creation

Simple input as in Excel.

Sheets are separate for each axis (or for each interpolation axis group) and data tables for each axis are displayed in an easy-to-understand manner.

Data tables can be exported as text files in CSV format.
This is effective when making printouts for document management.

Parts of a CSV file you want to copy to a data table can be copied using Cut & Paste.

Tool Operations

Independent from the operation modes (PROG and RUN) of the FPΣ control unit (or the FP2CPU unit), each axis can also be operated by tool operation.
JOG operation and teaching can be carried out easily to index positioning points and test operation is possible without having to create a rudder program.
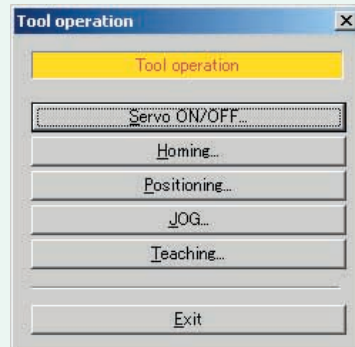
Data Monitor and Status Monitor

Data Monitor

● Data Table No. during operation.
● Auxiliary output
● Current position, speed and vector
● Error code, warning code
  (Errors and Warnings can also be cleared)

Status Monitor

● Connection status of each axis
● Model code of each motor amp and motor connected.
● Servo lock status
● Origin proximity input, limit input

Specifications

■Functional/Performance Specifications

		2-axis Type	4-axis Type	8-axis Type
Unit Specifications	No. of Control Axes	2 axes (2 axes x 1)	4 axes (4 axes x 1)	8 axes (8 axes x 1)
	Position Control Functions — Control Method	PTP Control, Cursor Path (CP) Control		
	Interpolation Control	2-axis/3-axis linear interpolation 2-axis circular interpolation 3-axis spiral interpolation		
	Control Units	pulse/μm/inch/degree		
	Position Data	600 points for each axis		
	Backup	Parameters and data file can be saved to FROM		
	Acceleration/deceleration Method	Linear acceleration/deceleration/S-curve acceleration/deceleration		
	Acceleration/deceleration Time	0 to 10,000ms (1ms units) Different setting for acceleration and deceleration is possible		
	Positioning Area	(-1,073,741,823 to 1,073,741,823 pulse) increment and absolute specification		
	Speed Control Functions	Supported with JOG operation (free run operation)		
	Origin Return — Search Method	Origin proximity (DOG) search		
	Creep Speed	Free settings possible		
	Other Functions	Pulser input operation support		
		Auxiliary output code, auxiliary output contact support		
		Dwell time support		
Communication Specifications	Communication Speed	100Mbps		
	Cable	Commercially-available LAN straight cable (shielded category 5e)		
	Connection Method	Ring method		
	Communication Cycle/No. of Terminals	0.5ms: max. 8 axes/system (command cycle: 1ms)		
	Transmission Distance	Between terminals: 60m. Total length: 200m		