

**Panasonic**  
ideas for life

Programmable Controller

**FP-X**

Introducing a New Transistor Output Model  
Pulse Output

# 4-Axis Integrated Control



2-Axis Linear  
Interpolation  
Simultaneously  
in 2 Pairs!



14-point type



30-point type



60-point type

**FP-X Programmable Controller**  
ARCT1B273E '06.8

**New**



AFPX-C60  
(Add-on cassette attached)

## ▶ Ultra High-speed Processing

High-speed scan of 0.32  $\mu$ s for a basic instruction  
(1.9 ms scan time for 5 ksteps\*<sup>1</sup>)

The processing speed of 0.32  $\mu$ sec, sufficient for a compact PLC, is even applicable when high-speed scanning is required.

\*1: A 5-kstep program consisting of 35% basic instructions and 65% applied instructions (data transfer, four operations)

## ▶ Large Capacity with an Extra Margin

Program capacity of 32 ksteps with a sufficient comment area\*<sup>2</sup>

The program capacity of 32 ksteps, exceeding the capacity of most compact PLCs, can flexibly handle a wide variety of applications requiring future equipment expansion.

\*2: C14: 16 ksteps

## ▶ Great Expandability with a Wide Variety of Options

Max. I/O expansion of 300 points and further expansion with a function expansion cassette

The add-on cassette easily enables functional enhancements when slightly more features are to be added, while keeping costs down. The expansion FP0 adapter enables the connection of 3 additional FP0 expansion units.

## High Security

Program protection with an 8-digit password and a function prohibiting uploads

## USB-port Equipped\*<sup>3</sup>

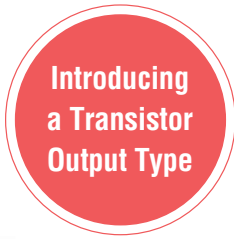
Easy direct connection with a PC via a commercial USB cable (AB type)

\*3: Not provided with C14.

## New Functions

- ▶ Easy-to-use Temperature Control Command (F356 EZPID)
- ▶ MEWTOCOL Master Function
- ▶ Ethernet Add-on Unit (Available Soon)
- ▶ Trace Function





# Programmable **FP-X** Controllers

**4-axis pulse output in a compact body** (C14 comes with 3 axes)

**Simultaneous 2-axis linear interpolation is possible in two pairs**

Servomotor and stepping motor control in production equipment has become increasingly diversified while requiring a greater number of axes – for example, electronic control for replacing cams, XY table + Z-axis control for cell-production and LCD alignment, 3D bending process of corrugated paper boxes and heat exchanger pipes, high-density coil winding operations etc. With such applications in mind, FP-X is a compact general-purpose PLC suited for small-scale equipment controls with its 4-axis pulse output built into the compact body, enabling multi-axis control in a very small space at a fraction of the equipment cost.



AFPX-C30  
(Add-on cassette attached)





AFPX-C14  
(Add-on cassette attached)

# The Highly Expandable Lineup Satisfies All Kinds of Needs.

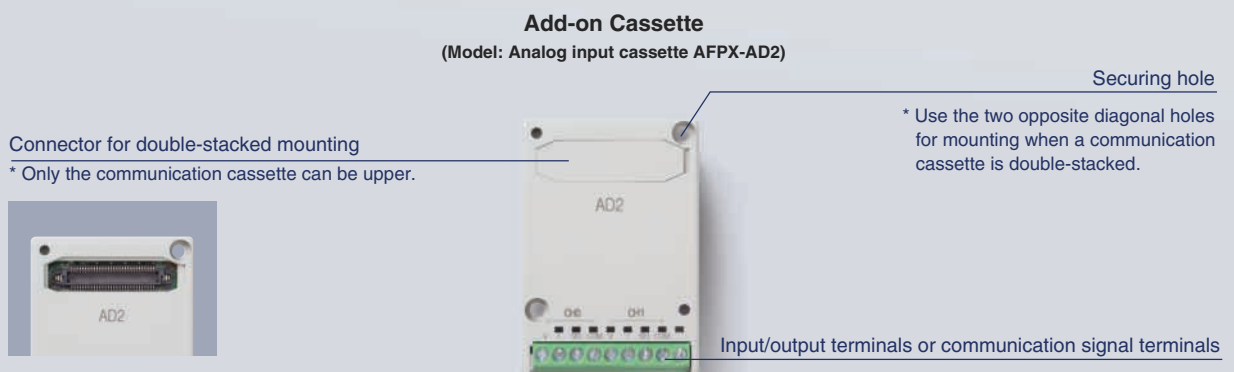
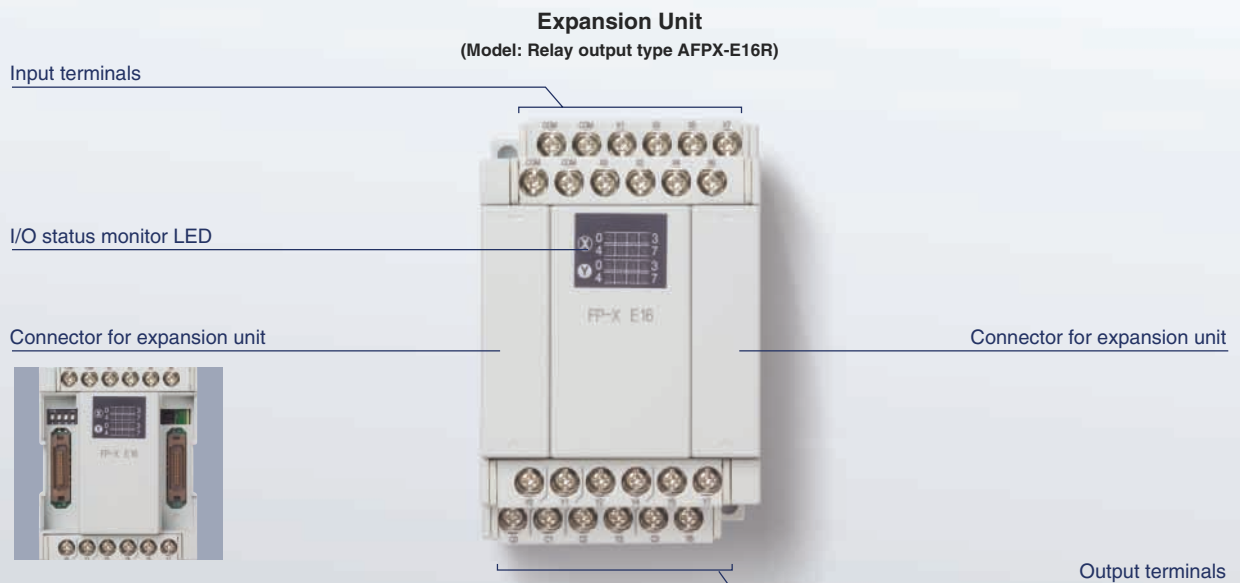
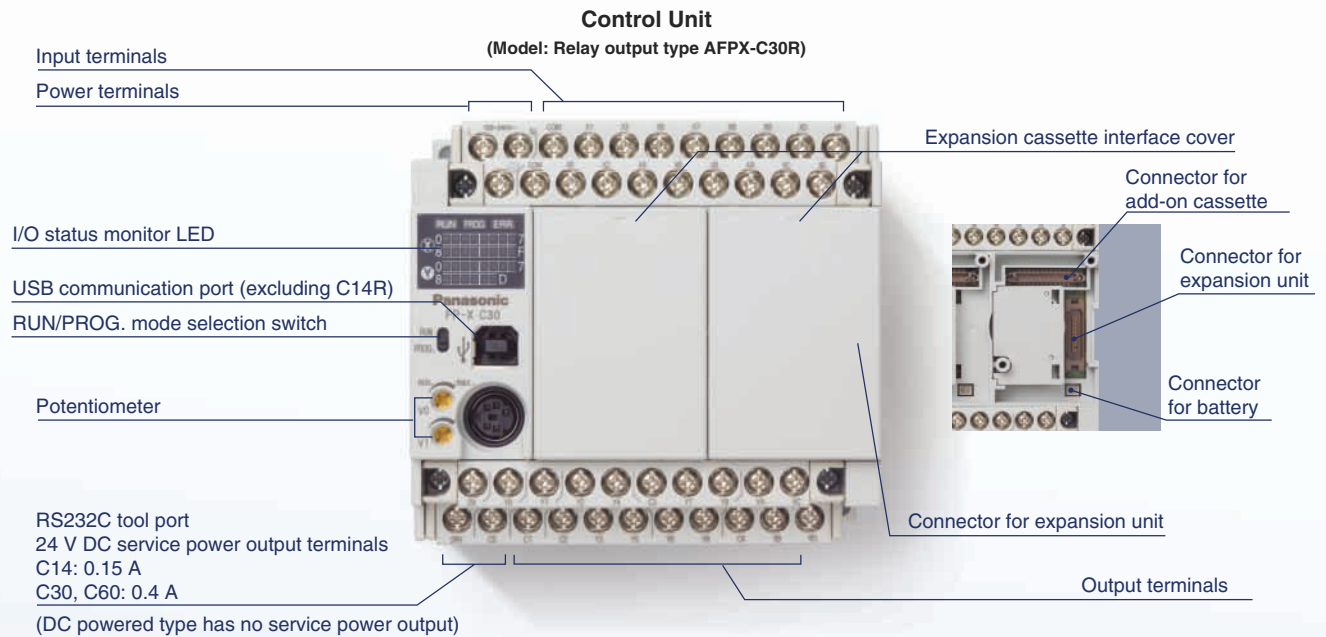
The flexible product lineup designed for rapidly responding to user needs provides a high level of satisfaction.

## Product Lineup

| Control Unit  | Relay output   | Transistor output  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
|---|--|--|-------------|----------------|----------------|-------------------------------|-----------------|--------------------------------|-----------------|--|------------------|--|-----------------|---|-----------------|----------------------------------|-----------------|--|-----------------|---|-----------------|--|------------------|--|----------------|----------------------------------|----------------|--------------------|-----------------|-------------------------------|-----------------|-------------------------------|----------------|--------------------------|----------------|--------------------------|----------------|---------------|-----------------|--------------|--------------------|---|-------------------|---------------|-------------------|--------------------------|
|  <b>AFPX-C14R</b>                          | Power supply (100 to 240 V AC)<br>DC input: 8 (24 V DC)<br>Relay output: 6 (250 V AC/2 A)<br>Program capacity: 16 ksteps<br>Potentiometer: 2   | <b>AFPX-C14TD</b> DC power supply, Transistor output (NPN), Input: 8-point, Output: 6-point<br><b>AFPX-C14T</b> AC power supply, Transistor output (NPN), Input: 8-point, Output: 6-point<br><b>AFPX-C14PD</b> DC power supply, Transistor output (PNP), Input: 8-point, Output: 6-point<br><b>AFPX-C14P</b> AC power supply, Transistor output (PNP), Input: 8-point, Output: 6-point   |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
|  <b>AFPX-C30R</b>                          | Power supply (100 to 240 V AC)<br>DC input: 16 (24 V DC)<br>Relay output: 14 (250 V AC/2 A)<br>Program capacity: 32 ksteps<br>Potentiometer: 2<br>Equipped with a USB communication port                           | <b>AFPX-C30TD</b> DC power supply, Transistor output (NPN), Input: 16-point, Output: 14-point<br><b>AFPX-C30T</b> AC power supply, Transistor output (NPN), Input: 16-point, Output: 14-point<br><b>AFPX-C30PD</b> DC power supply, Transistor output (PNP), Input: 16-point, Output: 14-point<br><b>AFPX-C30P</b> AC power supply, Transistor output (PNP), Input: 16-point, Output: 14-point   |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
|  <b>AFPX-C60R</b>                           | Power supply (100 to 240 V AC)<br>DC input: 32 (24 V DC)<br>Relay output: 28 (250 V AC/2 A)<br>Program capacity: 32 ksteps<br>Potentiometer: 4<br>Equipped with a USB communication port                           | <b>AFPX-C60TD</b> DC power supply, Transistor output (NPN), Input: 32-point, Output: 28-point<br><b>AFPX-C60T</b> AC power supply, Transistor output (NPN), Input: 32-point, Output: 28-point<br><b>AFPX-C60PD</b> DC power supply, Transistor output (PNP), Input: 32-point, Output: 28-point<br><b>AFPX-C60P</b> AC power supply, Transistor output (PNP), Input: 32-point, Output: 28-point   |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| Expansion Unit  |  |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
|  <b>AFPX-E16R</b>                         | DC input: 8 (24 V DC)<br>Relay output: 8 (250 V AC/2 A)<br>Remarks) Two or more E16R can't be connected serially because it can't supply the power to other units.   | <b>AFPX-E16T</b> Transistor output (NPN), Input: 8-point, Output: 8-point<br><b>AFPX-E16P</b> Transistor output (PNP), Input: 8-point, Output: 8-point   |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
|  <b>AFPX-E30R</b>                        | Power supply (100 to 240 V AC)<br>DC input: 16 (24 V DC)<br>Relay output: 14 (250 V AC/2 A)<br>Remarks) Addition of up to 8 units is possible including E16R and EFP0.   | <b>AFPX-E30TD</b> DC power supply, Transistor output (NPN), Input: 16-point, Output: 14-point<br><b>AFPX-E30T</b> AC power supply, Transistor output (NPN), Input: 16-point, Output: 14-point<br><b>AFPX-E30PD</b> DC power supply, Transistor output (PNP), Input: 16-point, Output: 14-point<br><b>AFPX-E30P</b> AC power supply, Transistor output (PNP), Input: 16-point, Output: 14-point   |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| Add-on Cassette   | Communication cassette   | Expansion FPO Adapter  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
|  <b>AFPX-COM1</b>                        | Communication cassette (RS232C 1 ch.)  |  <b>AFPX-EFPO</b><br>Up to 3 FPO expansion units can be connected.  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
|  <b>AFPX-COM2</b>                        | Communication cassette (RS232C 2 ch.)  |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>AFPX-COM3</b>  | Communication cassette (RS485/422 selectable 1 ch.)  |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>AFPX-COM4</b>  | Communication cassette (RS485 1 ch + RS232C 1 ch.)   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
|  <b>AFPX-COM5</b><br>(Avail. April 2007) | Communication cassette (Ethernet 1 ch + RS232C 1 ch.)  |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
|   | Application cassette   | FPO Expansion Unit   |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
|  <b>AFPX-IN8</b>                         | Input cassette (24 V DC, 8 input ch.)  | <table border="1"> <thead> <tr> <th>Part number</th> <th>Specifications</th> </tr> </thead> <tbody> <tr> <td><b>FPO-E8X</b></td> <td>8 ch. DC input, MIL connector</td> </tr> <tr> <td><b>FPO-E16X</b></td> <td>16 ch. DC input, MIL connector</td> </tr> <tr> <td><b>FPO-E8YT</b></td> <td>8 ch. transistor output, MIL connector</td> </tr> <tr> <td><b>FPO-E8YRS</b></td> <td>8 ch. relay output, screw terminal block</td> </tr> <tr> <td><b>FPO-E16T</b></td> <td>16 ch. transistor output, MIL connector</td> </tr> <tr> <td><b>FPO-E16P</b></td> <td>16 ch. PNP output, MIL connector</td> </tr> <tr> <td><b>FPO-E32T</b></td> <td>16 ch. DC input, 16 ch. transistor output, MIL connector</td> </tr> <tr> <td><b>FPO-E32P</b></td> <td>16 ch. DC input, 16 ch. PNP output, MIL connector</td> </tr> <tr> <td><b>FPO-E8RS</b></td> <td>4 ch. DC input, 4 ch. relay output, screw terminal block</td> </tr> <tr> <td><b>FPO-E16RS</b></td> <td>8 ch. DC input, 8 ch. relay output, screw terminal block</td> </tr> <tr> <td><b>FPO-A21</b></td> <td>2 ch. analog input, 1 ch. output</td> </tr> <tr> <td><b>FPO-A80</b></td> <td>8 ch. analog input</td> </tr> <tr> <td><b>FPO-A04V</b></td> <td>4 ch. analog (voltage) output</td> </tr> <tr> <td><b>FPO-A04I</b></td> <td>4 ch. analog (current) output</td> </tr> <tr> <td><b>FPO-TC4</b></td> <td>4 ch. thermocouple input</td> </tr> <tr> <td><b>FPO-TC8</b></td> <td>8 ch. thermocouple input</td> </tr> <tr> <td><b>FPO-IOL</b></td> <td>I/O link unit</td> </tr> <tr> <td><b>FPO-CCLS</b></td> <td>CC-Link unit</td> </tr> <tr> <td><b>FPO-E32RS*1</b></td> <td>16ch DC input, 16ch relay output screw terminal block</td> </tr> <tr> <td><b>FPO-RTD6*1</b></td> <td>6ch RTD input</td> </tr> <tr> <td><b>FPO-DPS2*1</b></td> <td>PROFIBUS remote I/O unit</td> </tr> </tbody> </table> | Part number | Specifications | <b>FPO-E8X</b> | 8 ch. DC input, MIL connector | <b>FPO-E16X</b> | 16 ch. DC input, MIL connector | <b>FPO-E8YT</b> | 8 ch. transistor output, MIL connector | <b>FPO-E8YRS</b> | 8 ch. relay output, screw terminal block | <b>FPO-E16T</b> | 16 ch. transistor output, MIL connector | <b>FPO-E16P</b> | 16 ch. PNP output, MIL connector | <b>FPO-E32T</b> | 16 ch. DC input, 16 ch. transistor output, MIL connector | <b>FPO-E32P</b> | 16 ch. DC input, 16 ch. PNP output, MIL connector | <b>FPO-E8RS</b> | 4 ch. DC input, 4 ch. relay output, screw terminal block | <b>FPO-E16RS</b> | 8 ch. DC input, 8 ch. relay output, screw terminal block | <b>FPO-A21</b> | 2 ch. analog input, 1 ch. output | <b>FPO-A80</b> | 8 ch. analog input | <b>FPO-A04V</b> | 4 ch. analog (voltage) output | <b>FPO-A04I</b> | 4 ch. analog (current) output | <b>FPO-TC4</b> | 4 ch. thermocouple input | <b>FPO-TC8</b> | 8 ch. thermocouple input | <b>FPO-IOL</b> | I/O link unit | <b>FPO-CCLS</b> | CC-Link unit | <b>FPO-E32RS*1</b> | 16ch DC input, 16ch relay output screw terminal block | <b>FPO-RTD6*1</b> | 6ch RTD input | <b>FPO-DPS2*1</b> | PROFIBUS remote I/O unit |
| Part number   | Specifications   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-E8X</b>  | 8 ch. DC input, MIL connector  |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-E16X</b>   | 16 ch. DC input, MIL connector   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-E8YT</b>   | 8 ch. transistor output, MIL connector   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-E8YRS</b>  | 8 ch. relay output, screw terminal block   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-E16T</b>   | 16 ch. transistor output, MIL connector  |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-E16P</b>   | 16 ch. PNP output, MIL connector   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-E32T</b>   | 16 ch. DC input, 16 ch. transistor output, MIL connector   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-E32P</b>   | 16 ch. DC input, 16 ch. PNP output, MIL connector  |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-E8RS</b>   | 4 ch. DC input, 4 ch. relay output, screw terminal block   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-E16RS</b>  | 8 ch. DC input, 8 ch. relay output, screw terminal block   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-A21</b>  | 2 ch. analog input, 1 ch. output   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-A80</b>  | 8 ch. analog input   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-A04V</b>   | 4 ch. analog (voltage) output  |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-A04I</b>   | 4 ch. analog (current) output  |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-TC4</b>  | 4 ch. thermocouple input   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-TC8</b>  | 8 ch. thermocouple input   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-IOL</b>  | I/O link unit  |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-CCLS</b>   | CC-Link unit   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-E32RS*1</b>  | 16ch DC input, 16ch relay output screw terminal block  |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-RTD6*1</b>   | 6ch RTD input  |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
| <b>FPO-DPS2*1</b>   | PROFIBUS remote I/O unit   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
|  <b>AFPX-TR8</b>                         | Output cassette (NPN transistor 0.3 A, 8 output ch.)   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
|  <b>AFPX-AD2</b>                         | Analog input cassette (12-bit non-insulated 0 to 10 V/0 to 20 mA, 2 ch.)   |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
|  <b>AFPX-PLS</b>                         | Pulse I/O cassette (High-speed counter input: single phase 80 kHz 2 ch., 2-phase 30 kHz 1 ch.)<br>(Pulse output: 1 axis 100 kHz < cw/ccw, pulse + sign >)<br><b>*Cannot be built into a transistor output type</b> |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |
|  <b>AFPX-MRTC</b>                        | Master memory cassette with a real-time clock (32 ksteps program memory + real-time clock in year/month/day/hour/minute)<br><b>*Real-time clock needs an option battery. (Real-time clock → Calendar timer)</b>    |  |             |                |                |                               |                 |                                |                 |  |                  |  |                 |   |                 |                                  |                 |  |                 |   |                 |  |                  |  |                |                                  |                |                    |                 |                               |                 |                               |                |                          |                |                          |                |               |                 |              |                    |   |                   |               |                   |                          |

\*1 Provided from Panasonic Electric Works Europe AG

# FP-X Name and Function of Each Part



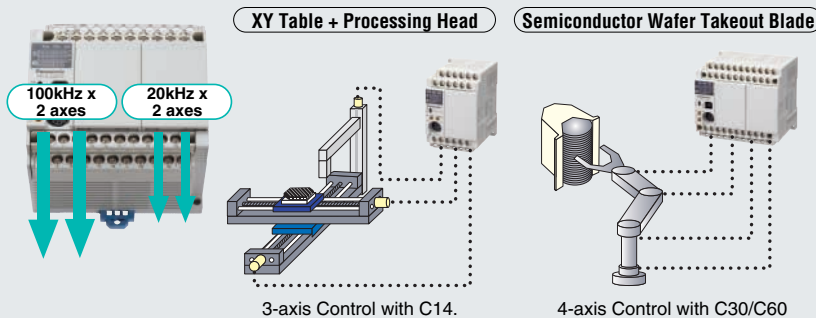
# Positioning

**FP-X perfectly fits the need for low cost “multi-axis positioning control in small-scale equipment”**

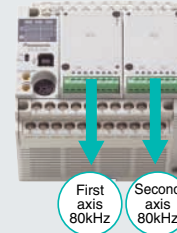
## ■ Built-in 4-axis Pulse Output (Transistor Output Type)

The transistor output type C14 comes with 3-axis while C30/60 comes with 4-axis pulse output inside the control unit. The multi-axis control, which previously required a higher-level PLC or additional positioning unit, or two or more PLC units, can now be achieved with only one FP-X transistor output type unit in a small space at a low cost. In addition, as this type does not require a pulse I/O cassette needed for a relay output type, other function expansion cassettes such as communication or analog input can be attached for more diversified applications.

| Item                       | Specification   |
|----------------------------|---|
| Pulse Output Max Frequency | C14: 100kHz(CH0,1), 20kHz(CH2)<br>C30,C60: 100kHz(CH0,1), 20kHz(CH2,3)                                |
| Output Type                | CW+CCW, Pulse + Direction Output  |
| Function                   | Trapezoidal control, multi-stage operation, jog operation, origin return, 2-axis linear interpolation |



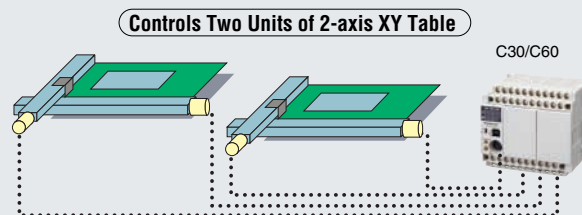
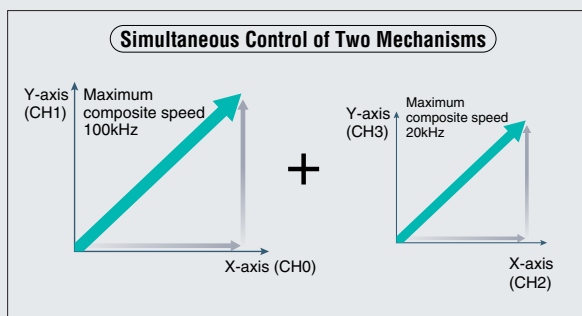
● The relay output type can control two axes by using the expansion cassettes



Pulse output up to 2-axis 80kHz is possible by loading two pulse I/O cassettes (AFPX-PLS). Also capable of performing 2-axis linear interpolation. **Pulse I/O cassette doesn't work with control unit transistor output type.**

## ■ 2-axis Linear Interpolation Simultaneously in two Sets (Transistor Output Type)

2-axis linear interpolation refers to moving a robot arm or equipment head diagonally on a straight line by simultaneously controlling two motor shafts. It is used for palletizing, component pick and place, XY table control, contour cutting of a PC board etc. FP-X transistor output type is capable of simultaneously controlling 2-axis linear interpolation, for the first time in the industry with a compact pulse-output PLC. This unit drastically expands the range of applications along with the added convenience of programming by using the linear interpolation commands F175 (SPSH).

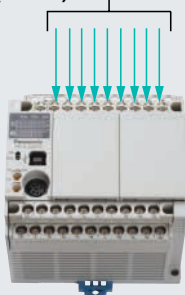


● The relay output type is also capable of 2-axis linear interpolation.

By adding two pulse I/O cassette units, linear interpolation is possible at the maximum composite speed of 80kHz. The command used for this unit is F175 (SPSH), same as that for the transistor output types.

## ■ High-Speed Counters – Eight Built-in Sets

Eight single-phase or four dual-phase sets (X0-X7)



| Model Type             | Output Mode  | Pulse Output (four axes) | One ch in use | All channels in use       |
|------------------------|--------------|--------------------------|---------------|---------------------------|
| Transistor Output Type | Single Phase | During Halt              | 100kHz        | 50kHz × 4ch + 10kHz × 4ch |
|                        |              | During Operation         | 35kHz         | 25kHz × 4ch + 10kHz × 4ch |
|                        | Dual Phase   | During Halt              | 35kHz         | 25kHz × 2ch + 5kHz × 2ch  |
|                        |              | During Operation         | 15kHz         | 10kHz × 2ch + 5kHz × 2ch  |
| Relay Output Type      | Single Phase | During Halt              | 10kHz         | 10kHz × 8ch               |
|                        |              | During Operation         | 10kHz         | 10kHz × 8ch               |
|                        | Dual Phase   | During Halt              | 5kHz          | 5kHz × 4ch                |
|                        |              | During Operation         | 5kHz          | 5kHz × 4ch                |

When adding a pulse I/O cassette to the relay output type, two high-speed counter sets can be added to every cassette. Please refer to the user manual for counter specification.



# Usability

The enhanced functionality expands the ranges of applications, while improving the ease of use.

## ■ Securing 0.5A in every transistor output even when all output ports are ON.

The transistor output type is not limited by the control capacity of each common line. Every output port can secure 0.5A even when all output ports are ON for any basic unit C14, C30, C60 as well as the expansion units E16 and E30 (at 25° C) – Sufficient capacity for high-load switching such as LED type signal tower etc.



LED signal tower

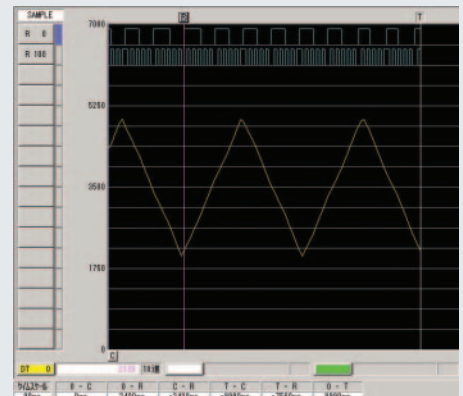
Transistor Output Capacity 0.5A  
(Even when all output ports are ON)

## ■ Equipped with a Sampling Trace Function – Smart Solution for Program Debugging

(Available from Ver. 2.0 of the transistor type and relay output types)

The sampling trace function enables the user to monitor a change of I/O condition or data register value in a very short time interval – an efficiency tool for debugging a ladder program.

The shortest sampling interval of the normal time-chart monitor is 10ms with the FPWIN GR or FPWIN PRO, but monitoring in much shorter intervals is often required during debugging operations. The sampling trace function enables data accumulation of any 16 contact data and 3 data register values once or several times within a scan time. Reading out these data through the FPWIN GR or FPWIN PRO enables the user to confirm an instantaneous change of status by time on the time-chart monitor.



(Normal Time-Chart Monitor)



(Sampling Trace)

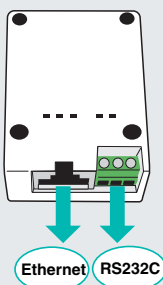


Invisible changes become visible!

## ■ The communication cassette (Ethernet Type) will be April 2007.

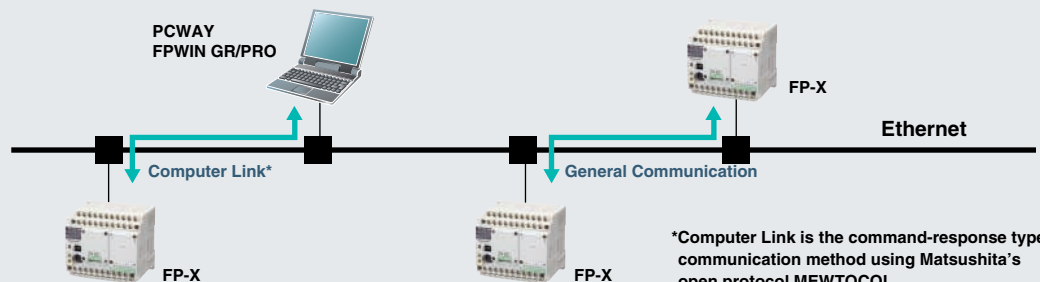
Using this option, you can monitor the data in FP-X on the PCWAY through the existing Ethernet, or remotely upload/download a program.

AFPX-COM5



|   |                          |                                      |                                  |
|---|--------------------------|--------------------------------------|----------------------------------|
| Interface                                       | Ethernet (COM1)          | 10BASE-T, 100BASE-TX, TCP/IP         |                                  |
|   | RS232C (COM2)            | 3-wire, Asynchronous, Max115.2kbps   |                                  |
| Ethernet Communication Mode (1:1 communication) | Computer Link            | General communication (server)       | General communication (client)   |
|   | PCWAY, FPWIN GR/PRO etc. | Wait for a connection by the partner | Connect to the specified partner |

FP-X ←                      → FP-X



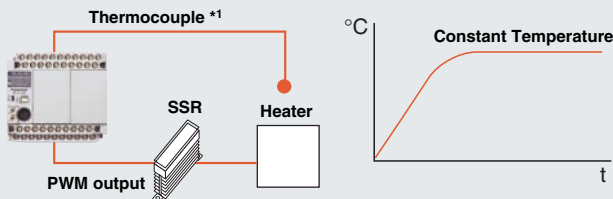
\*Computer Link is the command-response type communication method using Matsushita's open protocol MEWTOCOL.

# Temperature Control

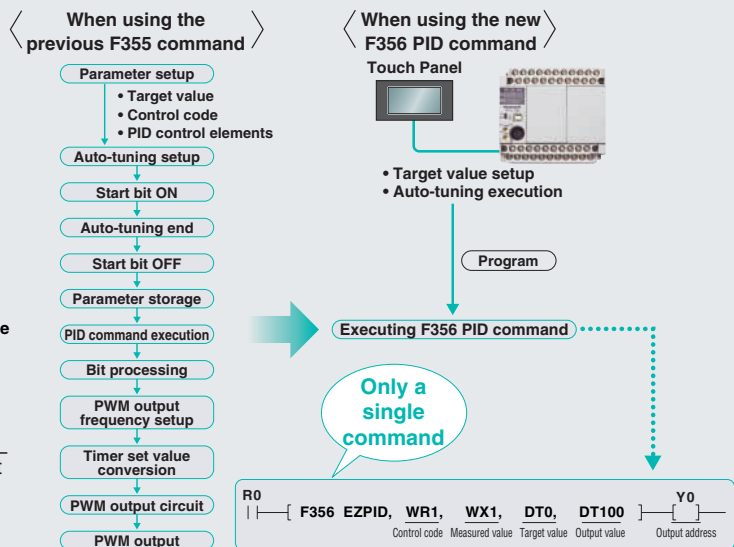
The high-level PID control easily achieves high-speed, high-accuracy multi-point temperature control.

## ■ New PID Command (F356 EZPID) Produces a Temperature Control Program only in a Single Line.

● The application of PLC-based temperature control has been expanding such as multi-level temperature control, timer-controlled temperature control, and a temperature control relative to a variable based on a data computation results etc. By using the new PID command (F356 EZPID), a PID control program can be drastically simplified and the PLC-based temperature control, which was previously thought to be difficult by a PLC, can easily be achieved. The example on the right, a simple uniform temperature control, enables a surprisingly easily PID control with a single line command by using a F356 command combined with a touch-panel operation.



\*1 Thermocouple connection requires FP0 Thermocouple Unit.

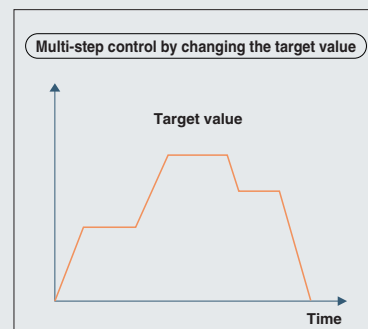
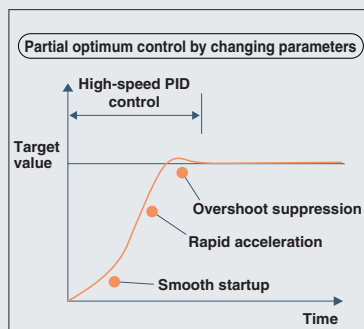
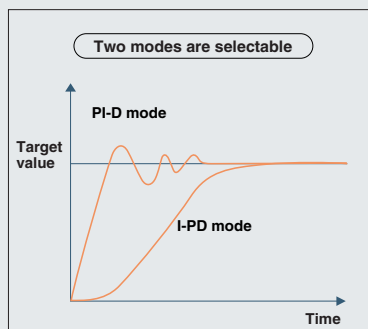
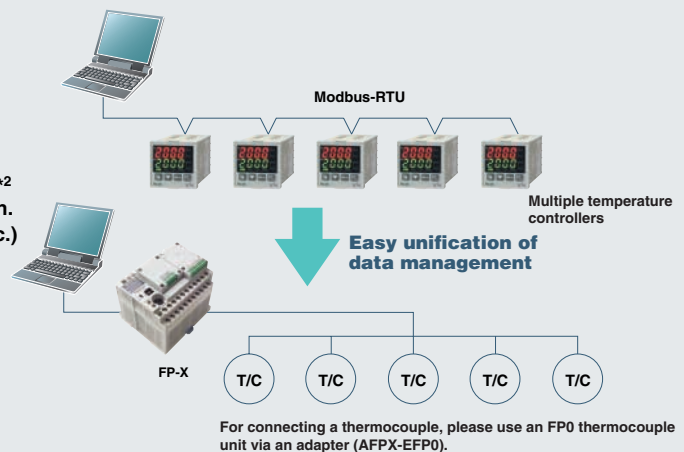


## ■ Multi-point PID control

- High-accuracy PID control is possible by adopting a sophisticated algorithm and floating-point operations.
- Higher accuracy is obtained by ultra high-speed computations in a 32  $\mu$ s/loop. For example, a 16-loop control only adds a scan time of 0.5 ms by ensuring minimum impact on the tact time.
- The simultaneous multi-point auto-tuning simplifies complex parameter setting.
- The high-speed control PI-D\*1 mode and overshoot suppression I-PD\*2 mode are available for selection according to the intended application.
- By combining with a sequence control, the parameters (Kp, Ti, Td, etc.) can be changed during a PID control execution, thereby enabling optimum temperature control in each stage including start up, mid-range, and convergence. The ability to change the target value easily enables multi-step temperature control, which was difficult only with temperature controllers. In addition, the multi-point temperature control enables the centralized control of multiple temperature controllers with a single FP-X for unified data management.

\*1 Derivative type

\*2 Proportional-derivative type





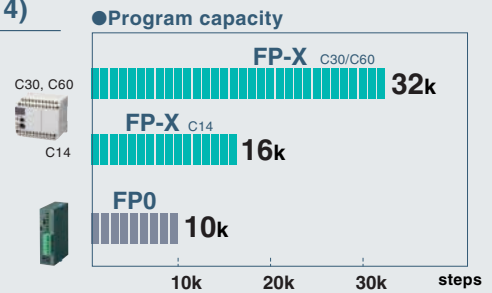
# High capacity/High speed

The high-level basic performance provides sufficient room for future equipment expansion as well as a rich variation.

## ■ Abundant program capacity - 32 ksteps (16 ksteps for C14)

The program capacity of 32 ksteps, exceeding the capacity of most compact PLCs, can flexibly handle a wide variety of applications requiring future equipment expansion. An adequate comment area has of course been reserved. Free comment entry makes the program easy to understand during verification.

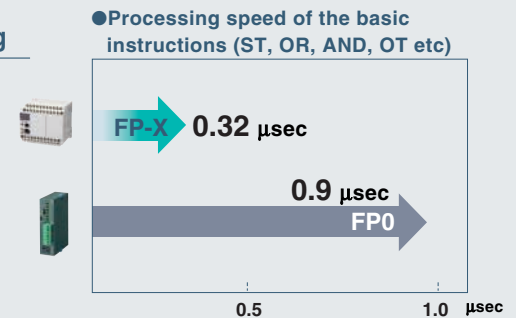
- Separate memory areas reserved for program memory and comments do not cause a reduction of program capacity when comments are entered.
- 100,000 I/O comment items, 5,000 lines of line-space comments, 5,000 lines of remark comments - All comments are stored in the FP-X simultaneously with the program.



## ■ Ultra high-speed scan at 0.32 μsec for instruction processing

High-speed processing is often required for small-scale equipment control such as serial data communication, network construction or PID temperature control. High-speed scanning at 0.32 μsec/step (basic instruction) easily meets such requirements.

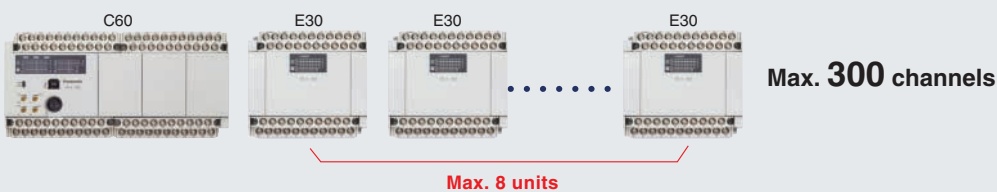
(Ex.) In the case of a 5-kstep program consisting of 35% basic instructions and 65% applied instructions,  
 → Scan time: 1.9 ms (measured time)



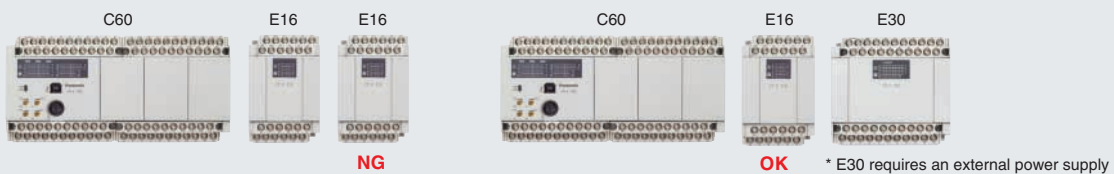
## ■ Abundant number of I/O points - Maximum 300 (Up to 382 points possible by using FP0 expansion units and add-on cassettes)

When the user cannot predict the number of I/O points required in the future for his machine or equipment, he is uncertain in selecting a PLC model. FP-X solves user concerns with a maximum of 300 I/O channels. The number can even be increased up to 382 points by using the add-on cassettes and FP0 expansion units.

- Expansion units (E16R, E30R, EFP0) can be connected up to eight units.



- Two or more E16 can't be connected serially.
- E16 can be sandwiched with E30\*



- Connection by using the cable included in each expansion unit.



The units can be tightly mounted adjacent to each other with the cable bent inside between the units for saving space.

# Expansion

**"Require slightly more functions", "Want to add functions to the existing equipment"**  
- The rich variety of expansion boards helps solve these requirements.

## ■ The **Add-on cassette** easily adds small quantities of functions and I/O points.

The add-on cassette can be mounted onto the control unit easily.

Up to 2 cassettes on C14 or up to 3 cassettes on C30/C60 can be mounted.

Only communication cassette can be double-stacked upper side. (Communication cassette should be only one totally.)

Note) Please refer to the manual for the number of mountable units and position.

| Add-on Cassette         |  | Specifications   |            |
|-------------------------|--|--|------------|
| Application Cassette    | DC input AFPX-IN8                            | 24 V DC input, 8 ch., bidirectional input (sync/source)  |            |
|                         | Transistor output AFPX-TR8                   | NPN, 8 ch., 0.3 A  |            |
|                         | Pulse I/O AFPX-PLS                           | High-speed counter input<br>→ Single-phase 2 ch. 80 kHz or two-phase<br>1 ch. 30 kHz<br>Pulse output<br>→ Single-axis 100 kHz (CW/CCW, Pulse+Sign) |            |
|                         | Cannot be used with a transistor output type |  |            |
|                         | Analog input AFPX-AD2                        | 2 ch., 12 bits (non-insulated), 2 ms/2 ch.<br>0 to 10 V or 0 to 20 mA  |            |
| Master memory AFPX-MPTC |  | 32-kstep program storage and transfer<br>Calendar timer  |            |
| Communication Cassette  | AFPX-COM1                                    | RS232C   | 1 ch.      |
|                         | AFPX-COM2                                    | RS232C   | 2 ch.      |
|                         | AFPX-COM3                                    | RS485/RS422 selectable <sup>*1</sup>   | 1 ch.      |
|                         | AFPX-COM4                                    | RS485 + RS232C <sup>*1</sup>   | 1 ch. each |
|                         | AFPX-COM5                                    | Ethernet 1ch + RS232C 1 ch (Available April 2007)  |            |

NEW

\*1: Each of RS485 and RS422 is an insulated type.



Easily removable  
(Two screws to secure the unit)

## ■ When further expansion or functions are required, use the existing **FP0 expansion unit**.

All control units can be expanded by up to 3 FP0 expansion units via an adapter.

Applications can be expanded by using [Transistor outputs], [Analog input/outputs], [Thermocouple input] and [I/O link (network)].

When further expansion or functions are required, use the existing FP0 expansion unit.

\* Only one expansion FP0 adapter unit can be attached to a control unit.  
Up to 7 FP-X expansion units can be used when the expansion FP0 adapter is attached.



Max. 7 units (210 points)

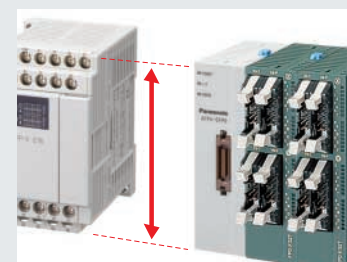
Max. 96 points



Expansion FP0 adapter (AFPX-EFP0)

| Product number | Specifications   | Product number          | Specifications  |
|----------------|--|-------------------------|---|
| FP0-E8X        | 8 ch. DC input, MIL connector                            | FP0-A21                 | Analog 2 ch. input, 1 ch. output                      |
| FP0-E16X       | 16 ch. DC input, MIL connector                           | FP0-A80                 | Analog 8 ch. input                                    |
| FP0-E8YT       | 8 ch. transistor output, MIL connector                   | FP0-A04V                | Analog (voltage) 4 ch. output                         |
| FP0-E8YRS      | 8 ch. relay output, screw terminal block                 | FP0-A04I                | Analog (current) 4 ch. output                         |
| FP0-E16YT      | 16 ch. transistor output, MIL connector                  | FP0-TC4                 | Thermocouple 4 ch. input                              |
| FP0-E32T       | 16 ch. DC input, 16 ch. transistor output, MIL connector | FP0-TC8                 | Thermocouple 8 ch. input                              |
| FP0-E8RS       | 4 ch. DC input, 4 ch. relay output, screw terminal block | FP0-IOL                 | I/O link unit   |
| FP0-E16RS      | 8 ch. DC input, 8 ch. relay output, screw terminal block | FP0-CCL                 | CC-link unit  |
|                |  | FP0-E32RS <sup>*2</sup> | 16ch DC input, 16ch relay output screw terminal block |
|                |  | FP0-RTD6 <sup>*2</sup>  | 6ch RTD input   |
|                |  | FP0-DPS2 <sup>*2</sup>  | PROFIBUS remote I/O unit                              |

\*2 Provided from Panasonic Electric Works Europe AG



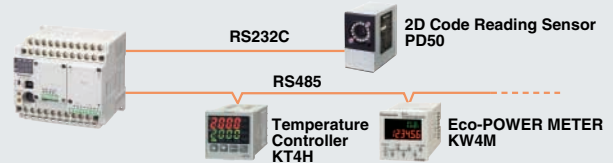
The unified unit height of 90 mm makes the panel surface look clean.

# Network

Different types of equipment need to be linked – FP-X flexibly meet such requirements.

## MEWTOCOL Master Function Has Been Added

By using the newly added MEWTOCOL master function for automatically generating MEWTOCOL (Matsushita Open Protocol) commands, serial communication with MEWTOCOL compatible units such as PD50, KT4H, KW4H etc becomes substantially easier.

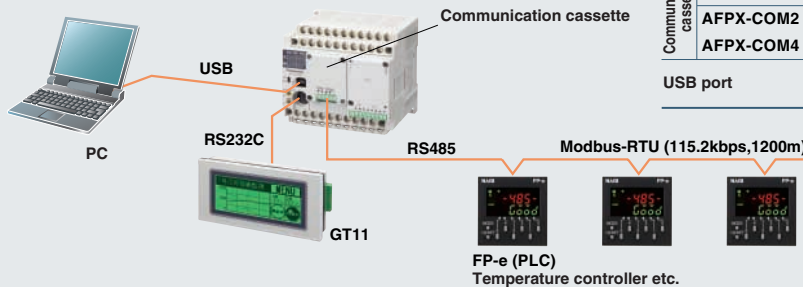


### Up to 3 serial communication ports can be used at once.

The use of a communication cassette provides up to 3 serial communication ports.

Usable interfaces include RS232C, RS485, RS422, and USB.

\*The RS232C tool port can be used as a general-purpose serial communication port.



| Communication Port       |  |                             |
|--------------------------|--|-----------------------------|
| RS232C tool port         |  | Always used                 |
| Communication cassette   | AFPX-COM1 (RS232C 1 ch.)               | Always used (Port No. COM1) |
|                          | AFPX-COM3 (RS485/422 selectable 1 ch.) |                             |
|                          | AFPX-COM2 (RS232C 2 ch.)               | 1st ch.                     |
| AFPX-COM4 (RS485+RS232C) | 2nd ch.                                |                             |
| USB port                 |  |                             |

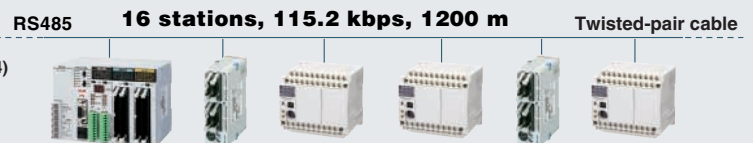
### PLC Link

The MEWNET-W0 allows program-free links of up to 16 PLC units such as FP2/2SH or FPΣ. The distributed control system allows efficient model selection.

- Simple setting of the number of linked units, linked relays, and starting area address of the own station by using FPWIN GR/Pro allows sharing of contact information and data without programming.
- The transfer rate of 115.2 kbps, the highest rate for a compact model.
- A transfer distance of 1200 m, the longest distance for a compact model.
- FP-X and FPΣ allow a change of the station number by programming (SYS instruction).

| Item                  | Specifications                                 |
|-----------------------|--|
| Number of stations    | 16 stations                                    |
| Transmission speed    | 115.2 kbps                                     |
| Transmission distance | 1200 m   |
| Shared data           | 128 words (data register), 64 words (contacts) |
| Communication method  | Floating master                                |

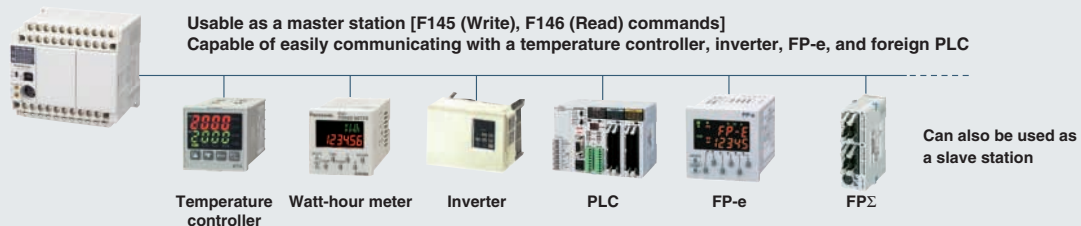
FP-X requires a communication cassette (AFPX-COM3 or AFPX-COM4)  
 FP2/2SH requires a multi-communication unit (AFP2465, AFP2805)  
 FPΣ requires a communication cassette (AFPG803, AFPG806)



### Modbus\* Compatibility

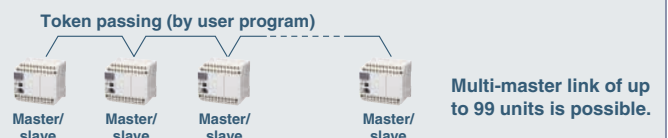
Compatible with both the master and slave of the Modbus\* RTU, the world's de-facto standard  
 Great performance is expected for air-conditioning, temperature controls etc.

\* Protocol developed by the Modicon Inc. of the United States



#### Another available application

When 17 or more FP-X units need to be linked, the use of a Modbus instead of a MEWNET-W0 can accommodate up to 99 FP-X units. Because each FP-X can be a master or slave, a multi-master link can be constructed by passing a token from a user program.



# Program protection

## Protects your important program by preventing illegal copies

### Program upload is easily prohibited by tool software FPWIN.

- Reading a program from the PLC main unit is virtually impossible.
- In the upload-prohibited condition, program transfers to the master memory are also prohibited.
- Release of an upload-prohibited condition is possible with a forced release accompanied by a program deletion.
- Program updates are easily carried out by transferring the program in the master memory to FP-X even during an upload-prohibited condition. The transferred program in FP-X is setup with the same upload prohibition and permission conditions used in the master memory.



|  |                                       |  |
|--|---------------------------------------|--|
| Items possible during an upload-prohibited condition   | Program download from a PC            | Forced input/output (Original program is required)     |
|  | Data transfer from the master memory  | Ladder monitor (Original program is required)          |
| Items impossible during an upload-prohibited condition | Change of data monitor/resistor value | Rewrite during RUN mode (Original program is required) |
|  | Contact monitor                       |  |
|  | Time chart monitor                    |  |
|  | Program upload to a PC                | Password protection                                    |
|  | Data transfer to the master memory    |  |

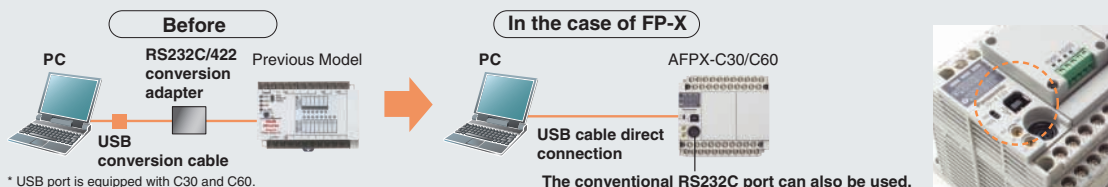
### More secure eight-character password can be used along with the previous four-character password.

- The combination of upper and lower case alphanumeric characters produces 218 trillion combinations. In addition, after three consecutive entry failures, a power reset is required for password release.

# Adaptability

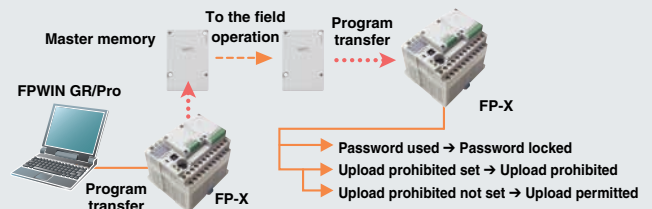
## High versatility and rich functionality provides “peace of mind” and “flexibility”.

### An expensive USB conversion adapter/cable is not necessary for connecting a PC to the PLC by using a standard USB port.\*



### The master memory makes a program transfer easy and a real-time clock is equipped also

- The built-in 1 MB flash-ROM can store a 32-kstep program as well as the comments and FPWIN Pro source file.
- Program update in a remote location is easy by simply sending master memory for local installation.
- As the master memory stores the password information, password protection can be applied for program transmission. Similarly, upload prohibition/permission can be setup.
- The built-in real-time clock enables periodical repeated control and periodical data logging.



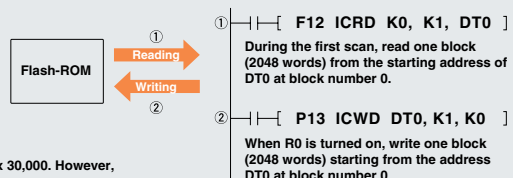
### No need for program backup – easy maintenance

- The programs and comments are stored in flash ROM, requiring no backup batteries.
- A backup battery is provided for data and real-time clock (AFPX-BATT) One battery for C14, two for C30 and three for C60 can be attached. A two-battery installation can operate for a long time (10 years or more) without maintenance. (Real-time clock doesn't work without a battery.)



### FROM data storage

- FP-X can store a program, comments, a total of 55 words of data, and bit setting values in a flash memory without a battery. All of the data and bits can be stored by adding optional batteries, but writing into a flash ROM is possible without a battery by using applied instructions (F12, P13). Perfectly suited for data storage of the setup values and recipes modified several times a day.



\* The limitation in a flash ROM designates the number of rewrites to be 10,000, or the feasible number to be approx 30,000. However, rewriting every second will generate a memory failure within a few hours.



# Programming

Note: Product names and company names in this chart are trademarks or registered trademarks of the respective companies.

## Control FPWIN GR for Windows

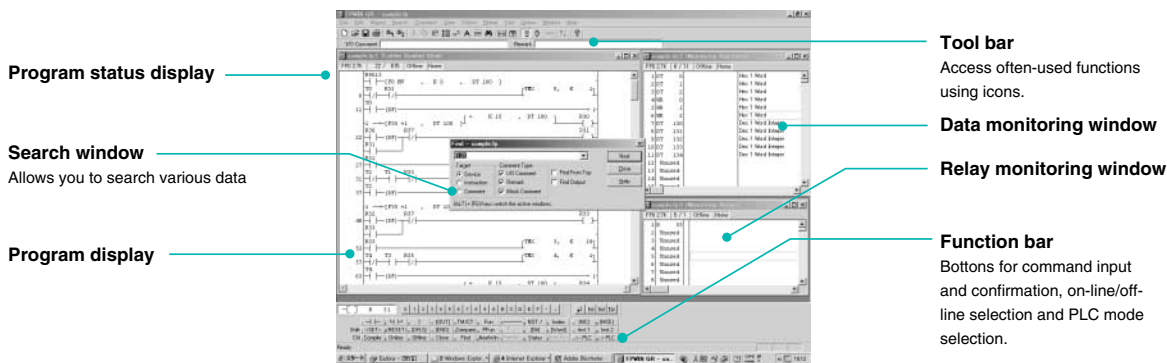
The ladder programming software for FP series – highly operational software tool for maximizing convenience in the field.

### ■ Features

1. Easy field operations not requiring the use of a mouse for data entry, search, writing, monitoring and timer changes, all carried out only from the keyboard.
2. Allows standard operations in Windows, such as Copy & Paste, etc.
3. All FP series PLCs are supported. The software assets produced by using Ver. 4 or Ver. 3 of NPST-GR are usable.
4. Easy programming with wizard functions.
5. Communication with OPC Server, CommX, GTWIN, PCWAY simultaneously through the same port.

### ■ Operational Environment

|                         |   |
|-------------------------|---|
| OS                      | Windows95 (OSR2 or higher)/98/Me/NT (Ver. 4.0 or later)/2000/XP                     |
| Hard disk capacity      | At least 40 MB  |
| CPU                     | Pentium 100 MHz or higher   |
| Onboard memory          | At least 64 MB (depends on OS)  |
| Screen resolution       | At least 1024 × 768   |
| Display colors          | High color (16-bit or higher)   |
| Applicable PLC          | FP-X/FP-e/FP0/FPΣ/FP2/FP2SH   |
| Compatible FP-X version | Relay output type: Ver.2.50 and after<br>Transistor output type: Ver.2.70 and after |

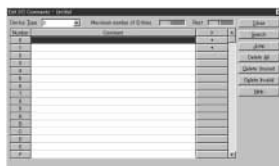


### Function instruction list



Classified by type, function instructions can be selected from the displayed list. (Simple help included.)

### I/O comment edit function



Successive I/O comments can be input for each device type. Data from Excel and other applications can be copied and pasted via the clipboard.

### Status display



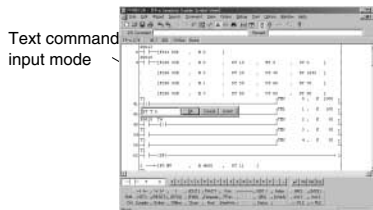
Displays information concerning PLC usage situation and settings, and detailed information when an error occurs.

### Text Compiler



This software is for importing and exporting programs created in text format to and from FPWIN GR. Programs created on the PLC of another company can be edited as text and then be transferred to the FP Series without difficulty.

### Text command input mode



A ladder diagram is displayed as a mnemonic code is entered from the keyboard.

## ■ Accompanying Tools

### ● Data Editor

This software for the PC is for reading and writing data stored in the memory of FP Series main unit or on an IC card. If a large data table is required in a PLC, the data can be created and edited on a PC and then download to the PLC.

### ● Modem connection

Communication via modem is easy with FP Series units in isolated locations.

### ● Wizard function

A Wizard function included in FPWIN GR since versions 2.2 can automatically generate ladder programs by simply entering and selecting required items in the dedicated screen. It can be used to assist in positioning, PID instruction input, and FP-e screen display instruction input.

### ● Personal preference settings

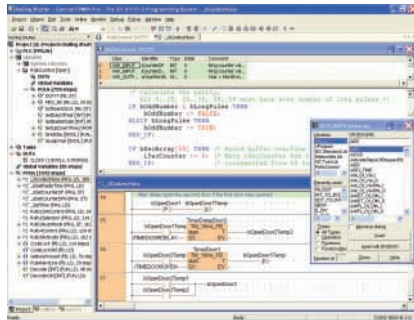
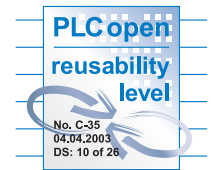
It is possible to switch among preference settings for FPWIN GR, Data Editor and Text Compiler that are set up for different individuals.

# Programming

Note: Product names and company names in this chart are trademarks or registered trademarks of the respective companies.

## Control FPWIN Pro (IEC61131-3 compliant Windows version software)

Compliant with international standard IEC61131-3  
Programming software approved by PLC Open



### ■ Features

#### 1. Five programming languages can be used.

Programming can be done using the language most familiar to the developer or using the language most suited to the process to be performed. High-level (structured text) languages that allow structuring, such as C, are supported.

#### 2. Easy to reuse well-proven programs

Efficiency when writing programs has been greatly increased by being able to split programming up for each function and process using structured programming.

#### 3. Keep know-how from getting out

By "black boxing" a part of a program, you can prevent know-how from leaking out and improve the program's maintainability.

#### 4. Conversion function for previously written programs provided to allow use of program assets.

#### 5. Uploading of source programs from PLC possible.

Maintainability increased by being able to load programs and comments from the PLC.

\* This only applies to FP-X, FPΣ and FP2 (with comment memory) and to FP2SH and FP10SH (with card board).

#### 6. Programming for all models in the FP series possible.

Any model can be used.

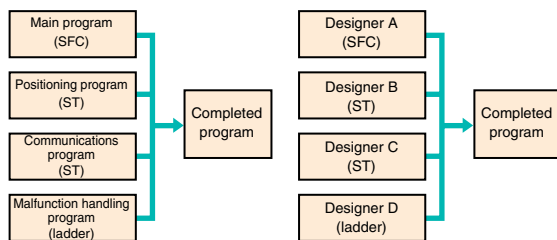
### ■ Programming in the most suitable language

#### ● Programming in the language most suited to the process

Easy-to-understand, efficient programs can be created, for example, by using a ladder program for machine control or ST for communications control.

#### ● Programming in the language you are good at

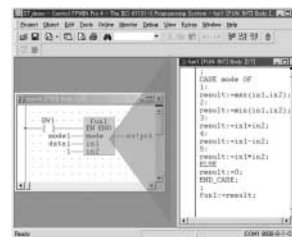
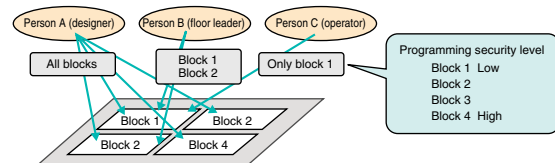
Programming time can be greatly reduced by the easy ability to split and then integrate programming for each function and process.



### ■ "Black boxing" of programs

#### ● Multiple passwords for protection of each block

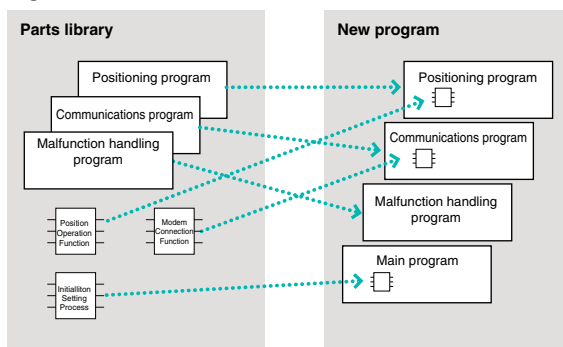
The security level (8 levels) can be input for each block in a program. Only users of a set security level or higher can make changes.



### ■ Reuse of programs is easy.

#### ● Register time-proven programs by block in the library.

#### ● By using variable identifiers (names), there is no need to be concerned with addresses for each machine when reusing programs.



### ■ Operational Environment

|                         |  |
|-------------------------|--|
| OS                      | Windows95 (OSR2 or higher)/98/Me/NT (Ver. 4.0 or later)/2000/XP                                    |
| Hard disk capacity      | At least 100 MB  |
| CPU                     | Pentium 100 MHz or higher  |
| Onboard memory          | At least 64 MB (depends on OS)   |
| Screen resolution       | At least 1024 × 768  |
| Display colors          | High Color (16-bit) or higher  |
| Applicable PLC          | FP-X/FP-e/FP0/FPΣ/FP1/FP-M/FP2/FP2SH/FP3/FP10SH  |
| Compatible FP-X version | Relay output type: Ver.5.1 and after<br>Transistor output type: Ver.5.3 and after (Available soon) |

# Part Number List

## FP-X Control Unit

|                   | Product name               | Power supply   | Specifications  | Part number |
|-------------------|----------------------------|----------------|---|-------------|
| Relay output      | FP-X C14R<br>Control unit  | 100 to 240V AC | 8-point input of 24 V DC, 6-point output of 2 A relay<br>Program capacity 16 ksteps, 2-point potentiometer                    | AFPX-C14R   |
|                   | FP-X C30R<br>Control unit  | 100 to 240V AC | 16-point input of 24 V DC, 14-point output of 2 A relay<br>Program capacity 32 ksteps, 2-point potentiometer, USB port        | AFPX-C30R   |
|                   | FP-X C60R<br>Control unit  | 100 to 240V AC | 32-point input of 24 V DC, 28-point output of 2 A relay<br>Program capacity 32 ksteps, 4-point potentiometer, USB port        | AFPX-C60R   |
| Transistor output | FP-X C14TD<br>Control unit | 24V DC         | 8-point of 24 V DC, 6-point output of 0.5 A transistor (NPN)<br>Program capacity 16 ksteps, 2-point potentiometer             | AFPX-C14TD  |
|                   | FP-X C14T<br>Control unit  | 100 to 240V AC | 8-point of 24 V DC, 6-point output of 0.5 A transistor (NPN)<br>Program capacity 16 ksteps, 2-point potentiometer             | AFPX-C14T   |
|                   | FP-X C14PD<br>Control unit | 24V DC         | 8-point of 24 V DC, 6-point output of 0.5 A transistor (PNP)<br>Program capacity 16 ksteps, 2-point potentiometer             | AFPX-C14PD  |
|                   | FP-X C14P<br>Control unit  | 100 to 240V AC | 8-point of 24 V DC, 6-point output of 0.5 A transistor (PNP)<br>Program capacity 16 ksteps, 2-point potentiometer             | AFPX-C14P   |
|                   | FP-X C30TD<br>Control unit | 24V DC         | 16-point of 24 V DC, 14-point output of 0.5 A transistor (NPN)<br>Program capacity 32 ksteps, 2-point potentiometer, USB port | AFPX-C30TD  |
|                   | FP-X C30T<br>Control unit  | 100 to 240V AC | 16-point of 24 V DC, 14-point output of 0.5 A transistor (NPN)<br>Program capacity 32 ksteps, 4-point potentiometer, USB port | AFPX-C30T   |
|                   | FP-X C30PD<br>Control unit | 24V DC         | 16-point of 24 V DC, 14-point output of 0.5 A transistor (PNP)<br>Program capacity 32 ksteps, 2-point potentiometer, USB port | AFPX-C30PD  |
|                   | FP-X C30P<br>Control unit  | 100 to 240V AC | 16-point of 24 V DC, 14-point output of 0.5 A transistor (PNP)<br>Program capacity 32 ksteps, 2-point potentiometer, USB port | AFPX-C30P   |
|                   | FP-X C60TD<br>Control unit | 24V DC         | 32-point of 24 V DC, 28-point output of 0.5 A transistor (NPN)<br>Program capacity 32 ksteps, 4-point potentiometer, USB port | AFPX-C60TD  |
|                   | FP-X C60T<br>Control unit  | 100 to 240V AC | 32-point of 24 V DC, 28-point output of 0.5 A transistor (NPN)<br>Program capacity 32 ksteps, 4-point potentiometer, USB port | AFPX-C60T   |
|                   | FP-X C60PD<br>Control unit | 24V DC         | 32-point of 24 V DC, 28-point output of 0.5 A transistor (PNP)<br>Program capacity 32 ksteps, 4-point potentiometer, USB port | AFPX-C60PD  |
|                   | FP-X C60P<br>Control unit  | 100 to 240V AC | 32-point of 24 V DC, 28-point output of 0.5 A transistor (PNP)<br>Program capacity 32 ksteps, 4-point potentiometer, USB port | AFPX-C60P   |

## FP-X Expansion Unit

|                   | Product name                  | Power supply   | Specifications  | Part number |
|-------------------|-------------------------------|----------------|---|-------------|
| Relay output      | FP-X E16R Expansion I/O unit  | —              | 8-point input of 24 V DC, 8-point relay output of 2 A<br>Remarks; Two or more E16R can't be connected serially because it can't supply the power to other units. With an 8cm extension cable                | AFPX-E16R   |
|                   | FP-X E30R Expansion I/O unit  | 100 to 240V AC | 16-point input of 24 V DC, 14-point relay output of 2 A<br>Remarks; Possible to connect up to 8 units including E16R, EFP0. With an 8cm extension cable   | AFPX-E30R   |
|                   | FP-X E16T Expansion I/O unit  | —              | 8-point input of 24 V DC, 8-point transistor (NPN) output of 0.5 A<br>Remarks; Two or more E16T cannot be connected serially because it cannot supply the power to other units. With an 8cm extension cable | AFPX-E16T   |
| Transistor output | FP-X E16P Expansion I/O unit  | —              | 8-point input of 24 V DC, 8-point transistor (PNP) output of 0.5 A<br>Remarks; Two or more E16P cannot be connected serially because it cannot supply the power to other units. With an 8cm extension cable | AFPX-E16P   |
|                   | FP-X E30TD Expansion I/O unit | 24V DC         | 16-point input of 24 V DC, 14-point transistor (NPN) output of 0.5 A<br>Remarks; Possible to connect up to 8 units including E16, EFP0. With an 8cm extension cable   | AFPX-E30TD  |
|                   | FP-X E30T Expansion I/O unit  | 100 to 240V AC | 16-point input of 24 V DC, 14-point transistor (NPN) output of 0.5 A<br>Remarks; Possible to connect up to 8 units including E16, EFP0. With an 8cm extension cable   | AFPX-E30T   |
|                   | FP-X E30PD Expansion I/O unit | 24V DC         | 16-point input of 24 V DC, 14-point transistor (PNP) output of 0.5 A<br>Remarks; Possible to connect up to 8 units including E16, EFP0. With an 8cm extension cable   | AFPX-E30PD  |
|                   | FP-X E30P Expansion I/O unit  | 100 to 240V AC | 16-point input of 24 V DC, 14-point transistor (PNP) output of 0.5 A<br>Remarks; Possible to connect up to 8 units including E16, EFP0. With an 8cm extension cable   | AFPX-E30P   |
|                   | Expansion FP0 Adapter         | 24V DC         | Up to 3 FP0 expansion units can be connected via an adapter.<br>With an 8cm extension cable and power cable   | AFPX-EFP0   |

## FP-X Add-on Cassette

| Product name   | Specifications  | Part number |
|--|---|-------------|
| FP-X COM1 Communication cassette                                     | RS232C 1 ch. RS, CS control signal equipped (non-insulated)   | AFPX-COM1   |
| FP-X COM2 Communication cassette                                     | RS232C 2 ch. (non-insulated)  | AFPX-COM2   |
| FP-X COM3 Communication cassette                                     | RS485/422 selectable 1ch (insulated)  | AFPX-COM3   |
| FP-X COM4 Communication cassette                                     | RS485 1 ch. (insulated) + RS232C 1 ch. (non-insulated)  | AFPX-COM4   |
| FP-X COM5 Communication cassette                                     | Ethernet 1 ch.(10BASE-T, 100BASE-TX) + RS232C 1 ch. (non-insulated)   | AFPX-COM5   |
| FP-X Input cassette  | 8 point input of 24 V DC  | AFPX-IN8    |
| FP-X Output cassette   | 8 point output of NPN 0.3 A   | AFPX-TR8    |
|  | 6 point output of PNP 0.5 A   | AFPX-TR6P   |
| FP-X Analog input cassette   | 2 point 12-bit non-insulated 0 to 10 V DC/0 to 20 mA  | AFPX-AD2    |
| FP-X Pulse I/O cassette<br>(for relay output type control unit only) | High-speed counter: single-phase 2 ch., each 80 kHz or two-phase 1 ch., 30 kHz.<br>Pulse output: one axis 100 kHz/ch. (Use restriction is applied for a two-unit installation)  | AFPX-PLS    |
| FP-X Master memory<br>with a real-time clock                         | Master memory: Capable of storing all program steps and comments simultaneously. Storage of FPWIN Pro source files.<br>Real-time clock: Year, month, day, hour, minute, second, day of week (optional battery required) | AFPX-MRTC   |

## FP-X Options and Service Parts

| Product name                 | Specifications   | Part number |
|------------------------------|--|-------------|
| FP-X Backup battery          | Battery for backing up the operation memory and real-time clock                          | AFPX-BATT   |
| FP-X Expansion cable (8 cm)  | Expansion unit connection cable, 8 cm  | AFPX-EC08   |
| FP-X Expansion cable (30 cm) | Expansion unit connection cable, 30 cm   | AFPX-EC30   |
| FP-X Expansion cable (80 cm) | Expansion unit connection cable, 80 cm   | AFPX-EC80   |
| FP-X Terminal block          | Terminal block for C30, C60 and E30, 21 pins, cover with no marking, five units included | AFPX-TAN1   |

# Part Number List

## FP0 Expansion Units

| Product name           | Specifications       |                         |         |                               |                                 |                 | Product number | Part number |
|------------------------|----------------------|-------------------------|---------|-------------------------------|---------------------------------|-----------------|----------------|-------------|
|                        | Number of I/O points | Power supply voltage    | Input   | Output                        | Connection type                 |                 |                |             |
| FP0 E8 Expansion Unit  | 8                    | Input: 8                | –       | 24 V DC Sink/Source (±common) | –                               | MIL connector   | FP0-E8X        | AFP03003    |
|                        | 8                    | Input: 4<br>Output: 4   | 24 V DC | 24 V DC Sink/Source (±common) | Relay output: 2 A               | Terminal block  | FP0-E8RS       | AFP03023    |
|                        | 8                    | Output: 8               | 24 V DC | –                             | Relay output: 2 A               | Molex connector | FP0-E8RM       | AFP03013    |
|                        | 8                    | Output: 8               | –       | –                             | Relay output: 2 A               | Terminal block  | FP0-E8YRS      | AFP03020    |
| FP0 E16 Expansion Unit | 16                   | Input: 16               | –       | 24 V DC Sink/Source (±common) | –                               | MIL connector   | FP0-E16X       | AFP03303    |
|                        | 16                   | Input: 8<br>Output: 8   | 24 V DC | 24 V DC Sink/Source (±common) | Relay output: 2 A               | Terminal block  | FP0-E16RS      | AFP03323    |
|                        | 16                   | Input: 8<br>Output: 8   | –       | 24 V DC Sink/Source (±common) | Relay output: 2 A               | Molex connector | FP0-E16RM      | AFP03313    |
|                        | 16                   | Output: 8               | –       | –                             | Transistor output:<br>NPN 0.1 A | MIL connector   | FP0-E16T       | AFP03343    |
| FP0 E16 Expansion Unit | 16                   | Output: 16              | –       | –                             | Transistor output:<br>NPN 0.1 A | MIL connector   | FP0-E16YT      | AFP03340    |
| FP0 E32 Expansion Unit | 32                   | Input: 16<br>Output: 16 | –       | 24 V DC Sink/Source (±common) | Transistor output:<br>NPN 0.1 A | MIL connector   | FP0-E32T       | AFP03543    |

- Notes: 1) The relay output type expansion units come with a power cable (part number AFP0581). (The transistor output type needs no power cable.)  
 2) The terminal block type relay output units have 2 terminal blocks (9 pins) made by Phoenix. Use a 2.5 mm wide screwdriver.  
 Preferably use the specific terminal block screwdriver (part number AFP0806, Phoenix type code SZS 0.4 × 2.5 mm) or equivalent.  
 3) The connector-type relay output units have 2 connectors made by Nihon Molex (Molex type code 51067-0900, 9 pins).  
 Use the specific Molex connector press-fit tool (part number AFP0805, Nihon Molex type code 57189-5000) or equivalent.  
 4) The transistor output units have a press-fit socket for wire-pressed terminal cable and contacts. Use the press-fit tool (part number AXY52000) for wire-pressed terminal cable.

## FP0 Intelligent Units

| Product name           | Specifications   | Product number | Part number |
|------------------------|--|----------------|-------------|
| FP0 Thermocouple unit  | K, J, T, R thermocouple, Resolution: 0.1 °C  | FP0-TC4        | AFP0420     |
|                        | K, J, T, R thermocouple, Resolution: 0.1 °C  | FP0-TC8        | AFP0421     |
| FP0 Analog I/O unit    | <Input specifications> Number of channels: 2 channels<br>Input range: 0 to 5 V, -10 to +10 V (Resolution: 1/4000)<br>0 to 20 mA (Resolution: 1/4000)               | FP0-A21        | AFP0480     |
|                        | <Output specifications> Number of channels: 1 channel<br>Output range: -10 to +10 V (Resolution: 1/4000)<br>0 to 20 mA (Resolution: 1/4000)                        |                |             |
| FP0 A/D Converter Unit | <Input specifications> Number of channels: 8 channels<br>Input range: 0 to 5, -10 to +10 V, -100 to 100 mV (Resolution: 1/4000)<br>0 to 20 mA (Resolution: 1/4000) | FP0-A80        | AFP0401     |
| FP0 D/A Converter Unit | <Output specifications> Number of channels: 4 channels<br>Output range: -10 to +10 V (Resolution: 1/4000)<br>4 to 20 mA (Resolution: 1/4000)                       | FP0-A04V       | AFP04121    |
|                        |  | FP0-A04I       | AFP04123    |

## FP0 Link Units

| Product name           | Specifications   | Power supply voltage | Product number | Part number |
|------------------------|--|----------------------|----------------|-------------|
| FP0 CC-Link Slave unit | This unit is for making the FP0 function as a slave station of the CC-Link.<br>Only one unit can be connected to the furthest right edge of the FP0 expansion bus.<br>Note: Accuracy will change if an FP0 thermocouple unit is used at the same time. For details, please refer to the FP0 catalog or to the CC-Link Unit manual. | 24 V DC              | FP0-CCLS       | AFP07943    |
| FP0 I/O Link unit      | This is a link unit designed to make the FP0 function as a station to MEWNET-F (remote I/O system).  | 24 V DC              | FP0-IOL        | AFP0732     |

## Control FPWIN GR for Windows

| Product name            | Type                  | Part number        | Applicable PLC |     |             |            |      |     |       |       |                |     |     |
|-------------------------|-----------------------|--------------------|----------------|-----|-------------|------------|------|-----|-------|-------|----------------|-----|-----|
|                         |                       |                    | FP-X           | FPΣ | FP0<br>FP-e | FP0<br>10k | FP1* | FP2 | FP2SH | FP-M* | FP3*<br>FP10SH |     |     |
| FPWIN GR<br>for Windows | English: Full type    | CD-ROM for Windows | AFPS10520      | A   | A           | A          | A    | A   | A     | A     | A              | A   | A   |
|                         | English: Small type   | CD-ROM for Windows | AFPS11520      | A   | A           | A          | A    | A   | N/A   | N/A   | A              | N/A | N/A |
|                         | English: Ver. up type | CD-ROM for Windows | AFPS10520R     | A   | A           | A          | A    | A   | A     | A     | A              | A   | A   |
|                         | Chinese               | CD-ROM for Windows | AFPS10820      |     |             |            |      |     |       |       |                |     |     |
|                         | Chinese: Ver. up type | CD-ROM for Windows | AFPS10820R     |     |             |            |      |     |       |       |                |     |     |
|                         | Korean                | CD-ROM for Windows | AFPS10920      |     |             |            |      |     |       |       |                |     |     |

\*The production of FP1, FP-M, FP3/FP10SH has been discontinued.

A: Available, N/A: Not available

## Control FPWIN Pro (IEC61131-3 compliant Windows version software)

| Product name             | Type                | Part number        | Applicable PLC |     |             |            |      |     |       |       |                |     |     |
|--------------------------|---------------------|--------------------|----------------|-----|-------------|------------|------|-----|-------|-------|----------------|-----|-----|
|                          |                     |                    | FP-X           | FPΣ | FP0<br>FP-e | FP0<br>10k | FP1* | FP2 | FP2SH | FP-M* | FP3*<br>FP10SH |     |     |
| FPWIN Pro<br>for Windows | English: Full type  | CD-ROM for Windows | AFPS50550      | A   | A           | A          | A    | A   | A     | A     | A              | A   | A   |
|                          | English: Small type | CD-ROM for Windows | AFPS51550      | A   | A           | A          | A    | A   | N/A   | N/A   | A              | N/A | N/A |

\*The production of FP1, FP-M, FP3/FP10SH has been discontinued.

A: Available, N/A: Not available

## Programmable Display GT series

| Product name     | Description        |         |                  | Part number |            |
|------------------|--------------------|---------|------------------|-------------|------------|
| GT01: Main Unit  | STN monochrome LCD | 5 V DC  | RS232C type      | Black       | AIGT0030B1 |
|                  |                    |         |                  | Ash gry     | AIGT0030H1 |
|                  |                    |         | RS422/RS485 type | Black       | AIGT0032B1 |
|                  |                    | 24 V DC | RS232C type      | Ash gry     | AIGT0032H1 |
|                  |                    |         |                  | Black       | AIGT0030B  |
|                  |                    |         | RS422/RS485 type | Ash gry     | AIGT0030H  |
| GT11: Main Unit  | STN monochrome LCD | 24 V DC | RS232C type      | Black       | AIGT0032B  |
|                  |                    |         |                  | Ash gry     | AIGT0032H  |
|                  |                    |         | RS422/RS485 type | Black       | AIGT2030B  |
|                  |                    | 24 V DC | RS232C type      | Ash gry     | AIGT2030H  |
|                  |                    |         |                  | Black       | AIGT2032B  |
|                  |                    |         | RS422/RS485 type | Ash gry     | AIGT2032H  |
| GT21C: Main Unit | STN color LCD      | 24 V DC | RS232C type      | Black       | AIGT2230B  |
|                  |                    |         |                  | Silver      | AIGT2230H  |
|                  |                    |         | RS422/RS485 type | Black       | AIGT2232B  |
|                  |                    | 24 V DC | RS232C type      | Black       | AIGT2230B  |
|                  |                    |         |                  | Silver      | AIGT2230H  |
|                  |                    |         | RS422/RS485 type | Black       | AIGT2232B  |
|                  |                    |         | Silver           | AIGT2232H   |            |



# Related Products List

## FP Memory Loader

| Product name       | Part number |
|--------------------|-------------|
| Data non-hold type | AFP8670     |
| Data hold type     | AFP8671     |

## PCWAY Ver. 2.7 (Operation Data Managing Software)

| Product name                   | Part number |
|--------------------------------|-------------|
| PCWAY IBM printer port version | AFW10011    |
| PCWAY USB port version         | AFW10031    |
| PCWAY Version upgrade          | AFW10401    |

\* Charged version upgrade for Ver. 2.0 to 2.6.

## Control CommX Ver. 1.3 (OCX for Communication)

| Product name                   | Part number |
|--------------------------------|-------------|
| Control CommX IBM printer port | AFW20011    |
| Control CommX USB port         | AFW20031    |

## FP Web-Server Unit

| Product name             | Part number |
|--------------------------|-------------|
| FP Web-Server unit       | AFP0610     |
| FP Web Configurator Tool | AFPS30510   |

## Key Unit

Economical type is available for secondary key.

The key unit is available for PCWAY and Control CommX.

| Product name                      | Part number |
|-----------------------------------|-------------|
| Key unit IBM printer port version | AFW1031*    |
| Key unit USB port version         | AFW1033     |

\*The discontinuation of AFW1031 production is scheduled for August 2007.

# Specifications

## 1. General Specifications

| Item                             | Description   |
|----------------------------------|---|
| Rated voltage                    | 100 to 240 V AC (AC power), 24 V DC (DC power)  |
| Operating voltage range          | 85 to 264 V AC (AC power), 20.4 to 28.8 V DC (DC power)   |
| Rush current                     | 40 A or less (C14), 45 A or less (C30, C60) at 25°C (AC power)<br>12 A or less at 25°C (DC power)   |
| Allowed momentary power off time | 10 ms or more   |
| Ambient temperature              | 0 to +55°C  |
| Storage temperature              | -40 to +70°C  |
| Ambient humidity                 | 10 to 95% RH (at 25 °C, non-condensing)   |
| Storage humidity                 | 10 to 95% RH (at 25 °C, non-condensing)   |
| Breakdown voltage                | Combined input/output terminals - Combined power and ground terminals, 2300 V AC 1 minute (AC power), 500 V AC <sup>*1</sup> 1 minute (DC power)                  |
|                                  | Input terminals - Relay output terminals, 2300 V AC <sup>*1</sup> 1 minute  |
|                                  | Input terminals - Transistor output terminals, 500 V AC <sup>*1</sup> 1 minute  |
| Insulation resistance            | Power terminals - Ground terminals, 1500 V AC <sup>*1</sup> 1 minute (AC power), 500 V AC <sup>*1</sup> 1 minute (DC power)                                       |
|                                  | Combined input/output terminals - Combined power and ground terminals, 100 MΩ or higher (500 V DC using an insulation resistance meter)                           |
|                                  | Input terminals - Output terminals, 100 MΩ or higher (500 V DC using an insulation resistance meter)  |
| Vibration resistance             | Power terminals - Ground terminals, 100 MΩ or higher (500 V DC using an insulation resistance meter)  |
| Shock resistance                 | 5 to 9 Hz, single amplitude 3.5 mm/9 to 150 Hz, constant acceleration 9.8 m/s <sup>2</sup> , 1 sweep/min, 10 sweeps in each XYZ direction<br>147 m/s <sup>2</sup> |
| Noise immunity                   | 1500 V [P-P] pulse width 50 ns, 1 μs (AC power), 500 V [P-P] pulse width 50 ns, 1 μs (DC power) (per noise simulator method) (power terminals)                    |
| Operating condition              | No corrosive gas and no excessive dust  |
| EC Directive Compliance Standard | Conforming to EN61131-2   |
| Level of contamination           | 2   |
| Over-voltage category            | II  |

\*1 Cutoff current 5 mA

## 2. Power Consumption, Weight

| Product name                | Part number | Current consumption          | Weight                |
|-----------------------------|-------------|------------------------------|-----------------------|
| Control unit                | AFPX-C14○○  | 26 W or less <sup>*2</sup>   | Approx. 280 g or less |
|                             | AFPX-C30○○  | 52 W or less <sup>*2</sup>   | Approx. 490 g or less |
|                             | AFPX-C60○○  | 64 W or less <sup>*2</sup>   | Approx. 780 g or less |
| Expansion I/O unit          | AFPX-E16○○  | 8 W or less <sup>*2</sup>    | Approx. 195 g or less |
|                             | AFPX-E30○○  | 42 W or less <sup>*2</sup>   | Approx. 430 g or less |
| Expansion FP0 adapter       | AFPX-EFP0   | 0.24 W or less <sup>*3</sup> | Approx. 65 g          |
| FP-X communication cassette | AFPX-COM1   | 2 W or less <sup>*2</sup>    | Approx. 20 g          |
|                             | AFPX-COM2   | 2 W or less <sup>*2</sup>    | Approx. 20 g          |
|                             | AFPX-COM3   | 2 W or less <sup>*2</sup>    | Approx. 20 g          |
|                             | AFPX-COM4   | 2 W or less <sup>*2</sup>    | Approx. 20 g          |
|                             | AFPX-COM5   | 2 W or less <sup>*2</sup>    | Approx. 20 g          |
| FP-X analog input cassette  | AFPX-AD2    | 2 W or less <sup>*2</sup>    | Approx. 25 g          |
| FP-X input cassette         | AFPX-IN8    | 1 W or less <sup>*2</sup>    | Approx. 25 g          |
| FP-X output cassette        | AFPX-TR8    | 1 W or less <sup>*2</sup>    | Approx. 25 g          |
|                             | AFPX-TR6P   | 1 W or less <sup>*2</sup>    | Approx. 25 g          |
| FP-X pulse I/O cassette     | AFPX-PLS    | 2 W or less <sup>*2</sup>    | Approx. 25 g          |
| FP-X master memory cassette | AFPX-MRTC   | 2 W or less <sup>*2</sup>    | Approx. 20 g          |

\*2 Power consumption by the AC power supply connected to the control unit    \*3 Power consumption by the DC power supply connected to the expansion FP0 adapter

\*4 Please refer to FP0 users manual for FP0 expansion units.

Please refer to the user manual and specifications for further details.

# Specifications

## 3. Controls Specifications

| Item                                     | Specifications  |  |
|--|---|--|
| Program method                           | Relay symbol method   |  |
| Control method                           | Cyclic operation method   |  |
| Program memory                           | Flash ROM built-in (no battery backup required)   |  |
| Program capacity                         | 16 ksteps (C14), 32 ksteps (C30, C60)   |  |
| Operation processing speed               | Basic instruction 0.32 μs/step  |  |
| Basic instructions                       | 111   |  |
| Applied instructions                     | 216   |  |
| External inputs (X)                      | 1760 points *4  |  |
| External outputs (Y)                     | 1760 points *4  |  |
| Internal relay (R)                       | 4096 points   |  |
| Special internal relay (R)               | 192 points  |  |
| Link relay (L)                           | 2048 points   |  |
| Timer/counter (T/C)                      | Total 1024 points: timer capable of counting (1 ms, 10 ms, 100 ms, 1 s) x 32767<br>Counter capable of counting 1 to 32767   |  |
| Data register (DT)                       | 12285 words (C14), 32765 words (C3R, C60)   |  |
| Link data register (LD)                  | 256 words   |  |
| Special data register (DT)               | 374 words   |  |
| Index register (I0 to ID)                | 14 words  |  |
| Master control relay (MCR)               | 256 points  |  |
| Number of labels (LOOP)                  | 256 labels  |  |
| Number of differentiations               | Up to program capacity  |  |
| Number of stepladders                    | 1000 stages   |  |
| Number of subroutines                    | 500 subroutines   |  |
| Number of interruption programs          | Relay output type: 15 programs (14 external, 1 constant)<br>Transistor output type: 9 programs (8 external, 1 constant)   |  |
| High-speed counter *5                    | Built-in (Transistor output): single-phase 8 ch (50 kHz x 4 ch + 10 kHz x 4 ch)<br>Built-in (Relay output): single-phase 8 ch (10 kHz x 8 ch)<br>Pulse I/O cassette (AFPX-PLS) for relay output type: single-phase 2 ch (80 kHz x 2 ch)   |  |
| Pulse output *6                          | Built-in (Transistor output): 100 kHz x 2 ch + 20 kHz x 2 ch<br>Pulse I/O cassette (AFPX-PLS) for relay output type: One unit (one axis) 100 kHz, or two units (two axes) 80 kHz  |  |
| Pulse catch input / interrupt input      | Relay output type: Total 14 points (including the high-speed counter)<br>Transistor output type: Total 8 points (including the high-speed counter)  |  |
| Periodical interrupt                     | 0.5 ms to 30 s  |  |
| Potentiometer                            | 2 points (0 to 1000) (C14, C30) 4 points (0 to 1000) (C60)  |  |
| Constant scan                            | Possible  |  |
| Real-time clock                          | Equipped (usable only when AFPX-MRTC is installed) *7   |  |
| Flash ROM backup *9                      | Backup by F12, P13 commands   | Data register (32765 words)  |
|  | Auto-backup at power failure  | Counter 16 points (1008 to 1023), Internal relay 128 points (R2470 to R255F), Data register 55 words |
| Battery backup                           | The memory allocated in the storage area by the system register (only when a battery is installed) *8   |  |
| Battery life (when no power is supplied) | Before installing AFPX-MRTC C14: 1230 days (actual operation 10 years at 25°C)<br>C30, C60: 990 days (actual operation 10 years at 25°C)<br>After installing AFPX-MRTC C14: 780 days (actual operation 10 years at 25°C)<br>C30, C60: 680 days (actual operation 10 years at 25°C)<br>(More than two batteries can be installed in C30 and C60. In this case, the battery life is extended several times) |  |
| Password                                 | Capable (4 or 8 characters selectable)  |  |
| Self-diagnosis function                  | Watch dog timer, program syntax check   |  |
| Comment storage                          | Capable (328 KB) (backup battery not required)  |  |
| PLC link function                        | Max 16 units, link relay 1024 points, link register 128 words (No data transfer or remote programming)  |  |
| Rewriting in RUN mode                    | Capable   |  |

\*4 The actual usable number of points is restricted by the hardware.

\*5 Specification at the rated input voltage of 24 V DC, 25°C. Frequency may be lower due to the voltage and temperature.

\*6 Max frequency may vary by the method of operation. Please refer to the manual for details.

\*7 Calendar accuracy at 0°C: 119 sec/month or less, 25°C: 51 sec/month or less, 55°C: 148 sec/month or less (Real-time clock requires a battery.)

\*8 When data is stored in the storage area while the battery is not installed, the data is not cleared and the data value may be indefinite.

The same condition occurs when the battery is exhausted.

\*9 The number of possible rewrites is 10,000 or less.

# Specifications

## 4. Input Specifications (Control unit, expansion unit)

| Item                         |                      | Description  |  |
|------------------------------|----------------------|--|--|
|                              |                      | Relay output   | Transistor output  |
| Insulation method            |                      | Photo-coupler  |  |
| Rated input voltage          |                      | 24 V DC  |  |
| Operating voltage range      |                      | 21.6 to 26.4 V DC  |  |
| Rated input current          |                      | Approx. 4.7 mA (Control unit X0 to X7)   | Approx. 8 mA (Control unit X0 to X3)   |
|                              |                      | Approx. 4.3 mA (Control unit X8 and after, expansion unit)   | Approx. 4.7 mA (Control unit X4 to X7)   |
| Input points per common      |                      | 8 points/common (C14, E16) 16 points/common (C30, C60)   |  |
|                              |                      | (Input power polarity either positive or negative)   |  |
| Min. ON voltage/ON current   |                      | 19.2 V/3 mA  | 19.2 V/6 mA (Control unit X0 to X3)<br>19.2 V/3 mA (Control unit X4 and after, expansion unit)   |
| Max. OFF voltage/OFF current |                      | 2.4 V/1 mA   | 2.4 V/1.3 mA (Control unit X0 to X3)<br>2.4 V/1 mA (Control unit X4 and after, expansion unit)   |
| Input impedance              |                      | Approx. 5.1 k $\Omega$ (Control unit X0 to X7)   | Approx. 3 k $\Omega$ (Control unit X0 to X3)   |
|                              |                      | Approx. 5.6 k $\Omega$ (Control unit X8 and after, expansion unit)   | Approx. 5.1 k $\Omega$ (Control unit X4 to X7)<br>Approx. 5.6 k $\Omega$ (Control unit X8 and after, expansion unit)   |
| Response time                | OFF $\rightarrow$ ON | Control unit X0 to X7<br>0.6 ms or less: Normal input<br>50 ms or less: High-speed counter, pulse catch, interruption input setting*1<br>Control unit X8 and after, expansion unit<br>0.6 ms or less | Control unit X0 to X3<br>135 $\mu$ s or less: Nominal input<br>5 $\mu$ s or less: High-speed counter, pulse catch, interruption input setting*1<br>Control unit X4 to X7<br>135 $\mu$ s or less: Nominal input<br>50 $\mu$ s or less: High-speed counter, pulse catch, interruption input setting*1<br>Control unit X8 and after, expansion unit<br>0.6 ms or less |
|                              | ON $\rightarrow$ OFF | Same as above  |  |
| Operating indicator          |                      | LED display  |  |

\*1 Specification at the rated input voltage of 24 V DC, 25°C.

## 5. Relay Output Specifications (Control units, Expansion units)

| Item                                    |                      | Description   |
|---|----------------------|---|
| Output type                             |                      | 1a contact  |
| Rated control capacity (Resistive load) |                      | 2 A 250 V AC, 2 A 30 V DC (8 A or less/common)  |
| Output points per common                |                      | 4 points/common   |
| Response time                           | OFF $\rightarrow$ ON | Approx. 10 ms   |
|   | ON $\rightarrow$ OFF | Approx. 8 ms  |
| Life time                               | Mechanical           | 20 million operations or more (Operation frequency 180 times/min)                           |
|   | Electrical           | 100,000 operations or more (Operation frequency 20 times/min at the rated control capacity) |
| Surge absorber                          |                      | None  |
| Operating indicator                     |                      | LED display   |

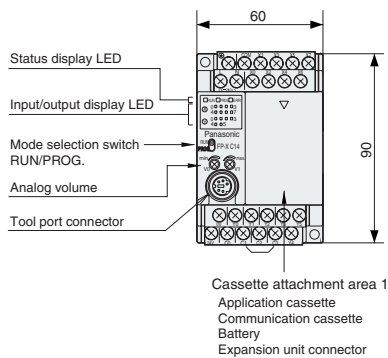
## 6. Transistor Output Specifications

| Item                                    |                      | Description   |
|---|----------------------|---|
| Insulation method                       |                      | Photocoupler  |
| Output type                             |                      | Open collector  |
| Rated load voltage                      |                      | NPN type: 5 to 24 V DC, PNP type: 24 V DC                                     |
| Load voltage allowable range            |                      | NPN type: 4.75 to 26.4 V DC, PNP type: 21.6 to 26.4 V DC                      |
| Max. load current                       |                      | 0.5 A   |
| Max. inrush current                     |                      | 1.5 A   |
| Output points per common                |                      | 8 points/common (C14, E16)   8 points/common, 6 points/common (C30, C60, E30) |
| OFF state leakage current               |                      | 1 $\mu$ A or less   |
| ON state voltage drop                   |                      | 0.3 V DC or less  |
| Response time                           | OFF $\rightarrow$ ON | 1 ms or less*2  |
|   | ON $\rightarrow$ OFF | 1 ms or less*2  |
| Voltage range for external power supply |                      | 21.6 to 26.4 V DC   |
| Surge absorber                          |                      | Zener diode   |
| Operating indicator                     |                      | LED display   |

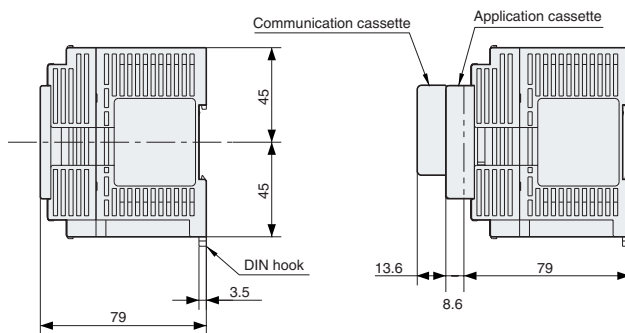
\*2 Please refer to the user manual for Y0 to Y7 of the transistor output type.

**FP-X Control Unit Dimensions (Unit: mm)**

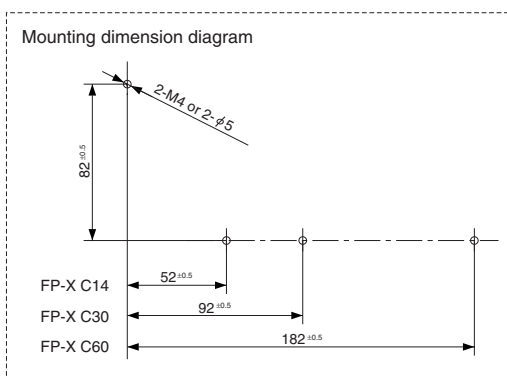
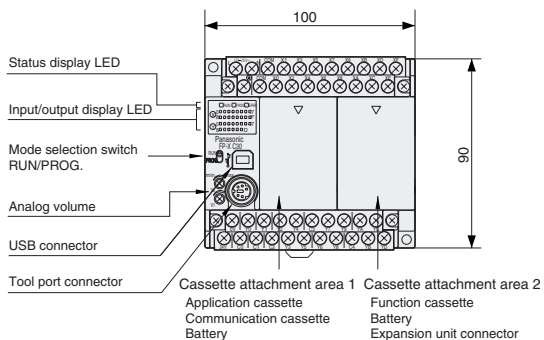
●AFPX-C14 \*\* (The same dimensions apply to the expansion I/O unit AFPX-E16\*\*)



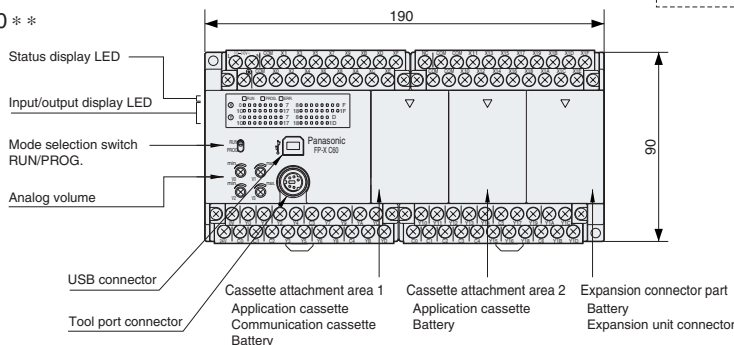
Dimensions when expansion cassettes (function and communication) are installed



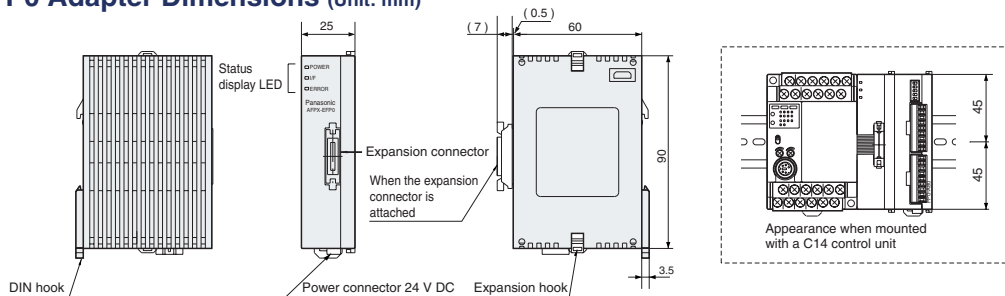
●AFPX-C30 \*\* (The same dimensions apply to the expansion I/O unit AFPX-E30\*\*)



●AFPX-C60 \*\*



**FP-X Expansion FP0 Adapter Dimensions (Unit: mm)**



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