

Think Automation and beyond...



# FT1A Controller



# SmartAXIS



Touch

Built-in LCD enables control and display

Pro/Lite

User-friendly interface for use in various applications

IDEC CORPORATION

(13/03/18)

# SmartAXIS Selection Guide

| Specifications                         |                               |           | Touch                                                                                                             |   | Pro                                                                                                                    |             |                                                                                                            |                 |                       |                                                                                                             |             |                                                                                                              |  |  |
|----------------------------------------|-------------------------------|-----------|-------------------------------------------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------|-----------------|-----------------------|-------------------------------------------------------------------------------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------|--|--|
|                                        |                               |           | <div></div> <div>Color LCD</div> |   | <div></div> <div>Monochrome LCD</div> |             | <div></div> <div>12</div> |                 |                       | <div></div> <div>24</div> |             | <div></div> <div>40</div> |  |  |
|                                        |                               |           |                                                                                                                   |   |                                                                                                                        |             |                                                                                                            |                 |                       |                                                                                                             |             |                                                                                                              |  |  |
| Part No.                               |                               |           | FT1A-*12RA-□                                                                                                      |   | FT1A-H12RA                                                                                                             | FT1A-H12RC  | FT1A-H24RA                                                                                                 | FT1A-H24RC      | FT1A-H40RKA           | FT1A-H40RSA                                                                                                 | FT1A-H40RC  |                                                                                                              |  |  |
| Power Voltage                          |                               |           | 24V DC                                                                                                            |   | 24V DC                                                                                                                 | 100-240V AC | 24V DC                                                                                                     | 100-240V AC     | 24V DC                | 24V DC                                                                                                      | 100-240V AC |                                                                                                              |  |  |
| No. of Inputs                          | Digital                       |           | 6 points                                                                                                          |   | 6 points                                                                                                               | 8 points    | 12 points                                                                                                  | 16 points       | 18 points             | 18 points                                                                                                   | 24 points   |                                                                                                              |  |  |
|                                        | Analog (digital compatible)   |           | 2 points                                                                                                          |   | 2 points                                                                                                               | —           | 4 points                                                                                                   | —               | 6 points              | 6 points                                                                                                    | —           |                                                                                                              |  |  |
| No. of outputs                         | Transistor (sink output)      |           | —                                                                                                                 |   | —                                                                                                                      | —           | —                                                                                                          | —               | 4 points              | —                                                                                                           | —           |                                                                                                              |  |  |
|                                        | Transistor (source output)    |           | —                                                                                                                 |   | —                                                                                                                      | —           | —                                                                                                          | —               | —                     | 4 points                                                                                                    | —           |                                                                                                              |  |  |
|                                        | Relay output                  | 10A relay | 4 points                                                                                                          |   | 4 points                                                                                                               | 4 points    | 4 points                                                                                                   | 4 points        | 4 points              | 4 points                                                                                                    | 4 points    |                                                                                                              |  |  |
|                                        |                               | 2A relay  | —                                                                                                                 |   | —                                                                                                                      | —           | 4 points                                                                                                   | 4 points        | 8 points              | 8 points                                                                                                    | 12 points   |                                                                                                              |  |  |
| Program Capacity                       |                               |           | 48KB<br>Configuration Memory Capacity: 5MB                                                                        |   | 12KB                                                                                                                   |             | 48KB                                                                                                       |                 | 48KB                  |                                                                                                             |             |                                                                                                              |  |  |
| Instructions Processing Time           | Basic Instruction             |           | 1,850μs/1,000 steps                                                                                               |   | 950μs/1,000 steps                                                                                                      |             |                                                                                                            |                 |                       |                                                                                                             |             |                                                                                                              |  |  |
|                                        | END Processing                |           | 5ms minimum                                                                                                       |   | 2ms                                                                                                                    |             |                                                                                                            |                 |                       |                                                                                                             |             |                                                                                                              |  |  |
| (Maximum Counter Frequency and Points) | Single/two-phase selectable   |           | 1 point<br>(5kHz, 2/4-edge, no single-phase use)                                                                  |   | 2 points<br>(Note 1)                                                                                                   | —           | 2 points<br>(Note 1)                                                                                       | —               | 2 points<br>(Note 1)  |                                                                                                             | —           |                                                                                                              |  |  |
|                                        | Single-phase                  |           | 4 points (×10kHz)                                                                                                 |   | 2 points<br>(×100kHz)                                                                                                  | —           | 4 points<br>(×100kHz)                                                                                      | —               | 4 points<br>(×100kHz) |                                                                                                             | —           |                                                                                                              |  |  |
| Pulse Output                           | 100kHz                        |           | —                                                                                                                 |   | —                                                                                                                      |             | —                                                                                                          |                 | 2 points              | 2 points                                                                                                    | —           |                                                                                                              |  |  |
|                                        | 5kHz                          |           | —                                                                                                                 |   | —                                                                                                                      |             | —                                                                                                          |                 | 2 points              | 2 points                                                                                                    | —           |                                                                                                              |  |  |
| Interface                              | USB Port                      |           | 2 (USB-A, USB-miniB)                                                                                              |   | 1 (Note 2)                                                                                                             |             | 1 (Note 2)                                                                                                 |                 | 1 (Note 2)            |                                                                                                             |             |                                                                                                              |  |  |
|                                        | Ethernet                      |           | 1                                                                                                                 |   | —                                                                                                                      |             | 1                                                                                                          |                 | 1                     |                                                                                                             |             |                                                                                                              |  |  |
|                                        | Expansion Communication Ports |           | —                                                                                                                 |   | —                                                                                                                      |             | 1                                                                                                          |                 | 2                     |                                                                                                             |             |                                                                                                              |  |  |
|                                        |                               | RS232C    |                                                                                                                   | 1 |                                                                                                                        | —           |                                                                                                            | 1 max. (Note 3) |                       | 2 max. (Note 3)                                                                                             |             |                                                                                                              |  |  |
|                                        |                               | RS422/485 |                                                                                                                   | 1 |                                                                                                                        | —           |                                                                                                            | 1 max. (Note 3) |                       | 2 max. (Note 3)                                                                                             |             |                                                                                                              |  |  |
|                                        | SD Memory Card                |           | —                                                                                                                 |   | —                                                                                                                      |             | —                                                                                                          |                 | 1 (Note 4)            |                                                                                                             |             |                                                                                                              |  |  |
|                                        | Memory Cartridge              |           | —                                                                                                                 |   | 1                                                                                                                      |             | 1                                                                                                          |                 | 1                     |                                                                                                             |             |                                                                                                              |  |  |
| Clock Function                         |                               |           | ✓                                                                                                                 |   | ✓                                                                                                                      |             | ✓                                                                                                          |                 | ✓                     |                                                                                                             |             |                                                                                                              |  |  |
| LCD                                    |                               |           | TFT color (65,536 colors)<br>STN monochrome (pink/red/white backlight)                                            |   | ✓<br>(STN monochrome)                                                                                                  |             | ✓<br>(STN monochrome)                                                                                      |                 | ✓<br>(STN monochrome) |                                                                                                             |             |                                                                                                              |  |  |
| Page                                   |                               |           | 4                                                                                                                 |   | 6                                                                                                                      |             | 6                                                                                                          |                 | 6                     |                                                                                                             |             |                                                                                                              |  |  |

\* LCD: M (STN monochrome), C (TFT color)    □ Bezel color: W (light gray), B (dark gray), S (silver)

Note 1: Single-phase: 100kHz, two-phase: 50kHz, 2/4-edge    Note 2: USB-miniB (maintenance port)

Note 3: When expansion communication cartridge is installed.    Note 4: SD memory card: 32GB max.

|  | Pro                                                                               |            |             |             | Lite                                                                              |             |                                                                                   |             |                                                                                    |             |             |                                                                                     |            |             |             |
|--|-----------------------------------------------------------------------------------|------------|-------------|-------------|-----------------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------|-------------|-------------|-------------------------------------------------------------------------------------|------------|-------------|-------------|
|  |  |            |             |             |  |             |  |             |  |             |             |  |            |             |             |
|  | 48                                                                                |            |             |             | 12                                                                                |             | 24                                                                                |             | 40                                                                                 |             |             | 48                                                                                  |            |             |             |
|  | FT1A-H48KA                                                                        | FT1A-H48SA | FT1A-H48KC  | FT1A-H48SC  | FT1A-B12RA                                                                        | FT1A-B12RC  | FT1A-B24RA                                                                        | FT1A-B24RC  | FT1A-B40RKA                                                                        | FT1A-B40RSA | FT1A-B40RC  | FT1A-B48KA                                                                          | FT1A-B48SA | FT1A-B48KC  | FT1A-B48SC  |
|  | 24V DC                                                                            | 24V DC     | 100-240V AC | 100-240V AC | 24V DC                                                                            | 100-240V AC | 24V DC                                                                            | 100-240V AC | 24V DC                                                                             | 24V DC      | 100-240V AC | 24V DC                                                                              | 24V DC     | 100-240V AC | 100-240V AC |
|  | 22 points                                                                         | 22 points  | 30 points   | 30 points   | 6 points                                                                          | 8 points    | 12 points                                                                         | 16 points   | 18 points                                                                          | 18 points   | 24 points   | 22 points                                                                           | 22 points  | 30 points   | 30 points   |
|  | 8 points                                                                          | 8 points   | —           | —           | 2 points                                                                          | —           | 4 points                                                                          | —           | 6 points                                                                           | 6 points    | —           | 8 points                                                                            | 8 points   | —           | —           |
|  | 18 points                                                                         | —          | 18 points   | —           | —                                                                                 | —           | —                                                                                 | —           | 4 points                                                                           | —           | —           | 18 points                                                                           | —          | 18 points   | —           |
|  | —                                                                                 | 18 points  | —           | 18 points   | —                                                                                 | —           | —                                                                                 | —           | —                                                                                  | 4 points    | —           | —                                                                                   | 18 points  | —           | 18 points   |
|  | —                                                                                 | —          | —           | —           | 4 points                                                                          | 4 points    | 4 points                                                                          | 4 points    | 4 points                                                                           | 4 points    | 4 points    | —                                                                                   | —          | —           | —           |
|  | —                                                                                 | —          | —           | —           | —                                                                                 | —           | 4 points                                                                          | 4 points    | 8 points                                                                           | 8 points    | 12 points   | —                                                                                   | —          | —           | —           |
|  | 48KB                                                                              |            |             |             | 12KB                                                                              |             | 48KB                                                                              |             | 48KB                                                                               |             |             | 48KB                                                                                |            |             |             |
|  | 950μs/1,000 steps                                                                 |            |             |             | 950μs/1,000 steps                                                                 |             |                                                                                   |             |                                                                                    |             |             |                                                                                     |            |             |             |
|  | 2ms                                                                               |            |             |             | 640μs                                                                             |             |                                                                                   |             |                                                                                    |             |             |                                                                                     |            |             |             |
|  | 2 points (Note 1)                                                                 |            | —           |             | 2 points (Note 1)                                                                 | —           | 2 points (Note 1)                                                                 | —           | 2 points (Note 1)                                                                  |             | —           | 2 points (Note 1)                                                                   |            | —           |             |
|  | 4 points (×100kHz)                                                                |            | —           |             | 2 points (×100kHz)                                                                | —           | 4 points (×100kHz)                                                                | —           | 4 points (×100kHz)                                                                 |             | —           | 4 points (×100kHz)                                                                  |            | —           |             |
|  | 2 points                                                                          | 2 points   | 2 points    | 2 points    | —                                                                                 |             | —                                                                                 |             | 2 points                                                                           | 2 points    | —           | 2 points                                                                            | 2 points   | 2 points    | 2 points    |
|  | 2 points                                                                          | 2 points   | 2 points    | 2 points    | —                                                                                 |             | —                                                                                 |             | 2 points                                                                           | 2 points    | —           | 2 points                                                                            | 2 points   | 2 points    | 2 points    |
|  | 1 (Note 2)                                                                        |            |             |             | 1 (Note 2)                                                                        |             | 1 (Note 2)                                                                        |             | 1 (Note 2)                                                                         |             |             | 1 (Note 2)                                                                          |            |             |             |
|  | 1                                                                                 |            |             |             | —                                                                                 |             | 1                                                                                 |             | 1                                                                                  |             |             | 1                                                                                   |            |             |             |
|  | 2                                                                                 |            |             |             | —                                                                                 |             | 1                                                                                 |             | 2                                                                                  |             |             | 2                                                                                   |            |             |             |
|  | 2 max. (Note 3)                                                                   |            |             |             | —                                                                                 |             | 1 max. (Note 3)                                                                   |             | 2 max. (Note 3)                                                                    |             |             | 2 max. (Note 3)                                                                     |            |             |             |
|  | 2 max. (Note 3)                                                                   |            |             |             | —                                                                                 |             | 1 max. (Note 3)                                                                   |             | 2 max. (Note 3)                                                                    |             |             | 2 max. (Note 3)                                                                     |            |             |             |
|  | 1 (Note 4)                                                                        |            |             |             | —                                                                                 |             | —                                                                                 |             | 1 (Note 4)                                                                         |             |             | 1 (Note 4)                                                                          |            |             |             |
|  | 1                                                                                 |            |             |             | 1                                                                                 |             | 1                                                                                 |             | 1                                                                                  |             |             | 1                                                                                   |            |             |             |
|  | ✓                                                                                 |            |             |             | ✓                                                                                 |             | ✓                                                                                 |             | ✓                                                                                  |             |             | ✓                                                                                   |            |             |             |
|  | ✓<br>(STN monochrome)                                                             |            |             |             | —                                                                                 |             | —                                                                                 |             | —                                                                                  |             |             | —                                                                                   |            |             |             |
|  | 6                                                                                 |            |             |             | 6                                                                                 |             | 6                                                                                 |             | 6                                                                                  |             |             | 6                                                                                   |            |             |             |

# SmartAXIS Touch

FT1A Controller

×

Small vivid LED display

## Save installation space, wire, and time.

Touch is an advanced, 3.8-inch display with integrated control and monitor functions. A bright LED backlight provides a vivid display.

Actual Size



## Control Functions

Fast Processing Speed

### Stable and efficient processing

Basic instructions processing time: 1850μs/1000 steps. Fast processing time is available in the integrated control function.

10A Relay

### No external relay, reducing wiring

Max. 10A output enables direct operation of solenoid valves. No additional circuit necessary to connect a relay, reducing wiring.



Memory

### Large memory size enables stress-free programming of easy-to-see screen

Stress-free programming with large memory size - 48KB program size and 5MB configuration memory capacity.

USB Flash Drive

### Easy log data saving

Integrated data logging function using an USB memory. Programs can also be changed easily.

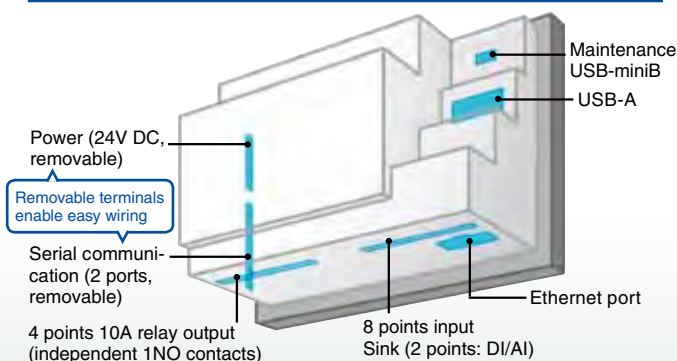


High Speed

### High-speed counter

Fast counter (single-phase 10 kHz/4 point, two-phase 5 kHz/1 point).

### Structure





Vertical  
OK

SmartAXIS

**TFT color**  
LCD  
3.8 inch

**400** cd/m<sup>2</sup>

**STN monochrome**  
LCD  
3.7 inch

**740** cd/m<sup>2</sup>

## Display Functions

Color  
LCD

### 65,536-color high-resolution TFT LCD

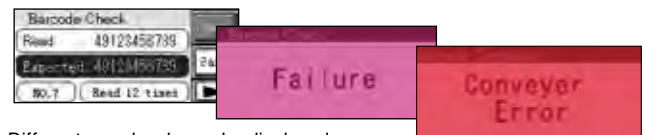
Brightest LCD in its class. Compact screen with unparalleled visibility.



Mono-  
chrome

### Backlit with pink, red, or white colors

Check the system status easily with the super-bright display with pink, red, or white backlight. Displays the same level of brightness as the color LCD models.



Different error levels can be displayed.

32-level  
Brightness  
Adjustment

### LED backlight dimming control

The brightness of the backlight can be adjusted according to surrounding conditions (day/night), saving energy.

Fast  
start-up

### Stress-free, 3-second start-up

Fast start-up allows for easy debugging and stress-free operation.



Rear Mount  
Adapter

### Flexible system design with rear mount adapter

An adapter to rear mount the Touch. Choose the most suitable mounting method to mount on the equipment.

(The customer should prepare the panel surface sheet and panel cut-out.)



When installed



Rear mount  
adapter  
(optional)

For other functions see page 8 ▶

Control functions x Optimum control

## Controls for various applications

Compact, easy-to-use controller. Independent dual axis, high-speed counter, and interrupt input are available. Equipped with an LCD, HMI functions such as messages, monitoring, and parameters can be changed easily. Status monitoring and maintenance is possible to enhance productivity.



Pro

(Photo: when cartridge is used)

## Control Functions

Fast  
Processing  
Speed

### Stable and efficient processing

Basic instructions processing time:  
950μs/1000 steps

Memory

### Large memory size for easy-to-see screen

Large program memory (12 I/O: 12 KB, 24 I/O and up: 48 KB) achieves reduction of development processes.

High  
Speed  
Counter

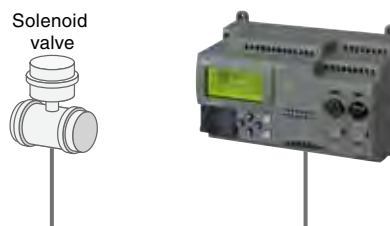
### Positioning control possible with only one controller

Supports positioning control with a single-phase (100 kHz)/4 point or a single-phase (100 kHz)/two-phase (50 kHz)/2 point high-speed counter input. Ideal for easy positioning or motor control using a rotary encoder. Equipped with 6 points for interrupt input, catch input, and frequency input.

10A  
Relay

### No external relay, reducing wiring

10A output relays connect directly to small motors and solenoid valves. No additional circuit necessary to connect a relay, reducing wiring.



High-speed  
Output

### Built-in biaxial positioning function

Independent dual-axis control is performed using two pulse outputs. Locational values can be easily defined for precise position (trapezoidal) control.

[See page 9](#)



(Photo: when cartridge is used)

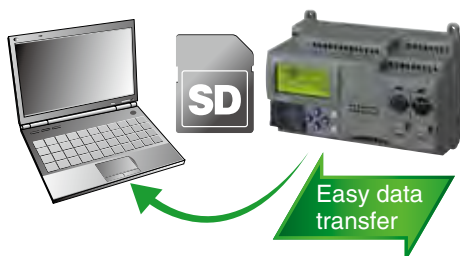
Lite

SmartAXIS Lite is a controller without an LCD. Ideal for use in a control panel where there is no need for user operation.

#### SD Memory Card

### Easy log data saving

Data can be saved or transferred by using an SD memory card. Saved data can be read via Ethernet. Up to 64 data registers can be saved at the same time. Can store up to 4 data per second (depends on the program processing speed.)

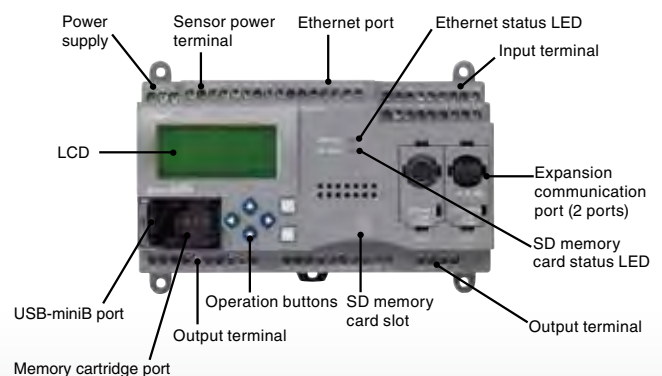


#### Memory Cartridge

### Easy maintenance, no PC required.

User programs can be read or written easily, reducing labor. When a memory cartridge is installed in the SmartAXIS, the user program stored in the memory cartridge is executed.

### Structure



For other functions see page 8 ►

# SmartAXIS Functions

## Touch/Pro/Lite Functions

### I/O Monitor

### "I/O status monitor" screen for monitoring I/O status

The monitor screens on LCD show ON/OFF status of I/Os (Touch/Pro only), enabling quick I/O status monitoring when error occurs.

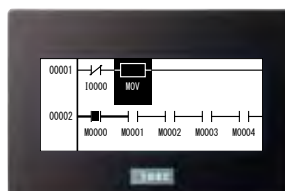


### Ladder Monitor

### Easy troubleshooting

Easy ladder program monitoring using 4 buttons. Parameters on monitor screens can be checked and changed easily. (Touch/Pro only)

Touch



Pro



Inputs from the operation buttons can be programmed as digital inputs. No external device necessary for checking the programs.

### Clock

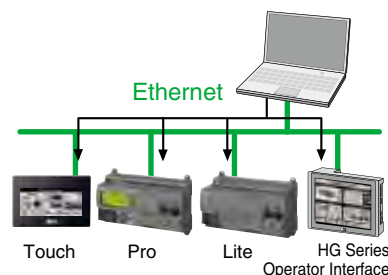
### Easy time schedule control using "Clock Function"

Clock function enables you to automatically control the time schedule for systems such as lighting or water sprinkler.

### Ethernet

### Remote maintenance

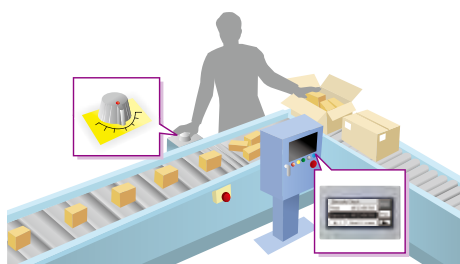
The user program can be downloaded to/uploaded from the SmartAXIS at remote locations via Ethernet (except 12 I/O type of Pro/Lite).



### Efficiency

### Digital/analog (0 to 10V DC) compatible input

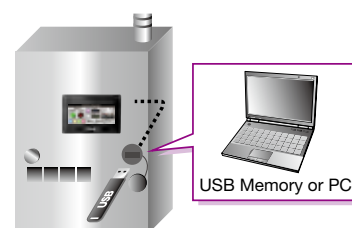
External analog potentiometer makes it easy to set the timer. Suitable for applications requiring a few analog inputs. (Pro/Lite: DC power model only)



### Front Panel Maintenance

### Easy data maintenance, shortening setup and adjustment time.

Using a panel mount extension cable, data can be transferred without opening the panel. Debugging of ladder program in the controller is also possible (Touch only).



### Security

### Password protection for secure system operation

Protect systems and programs using a password.



### Operator Interface

### Connection to Operator Interface

Pro/Lite can be connected to IDEC's HG series operator interface for powerful expressivity and rich information.



Photo: HG3G Operator Interface

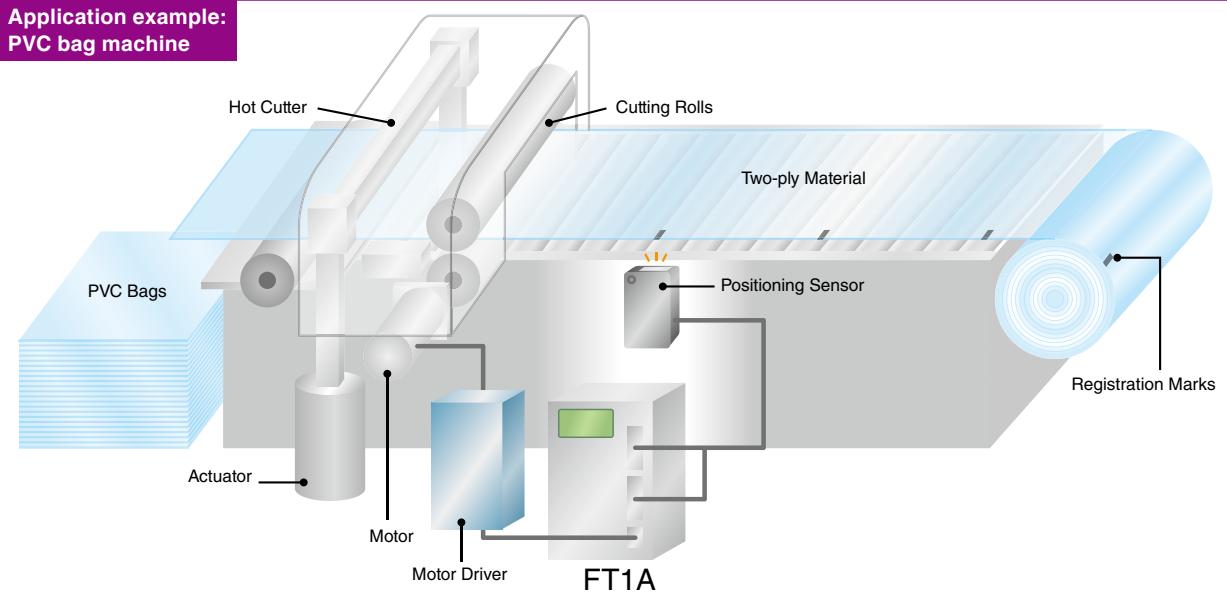
## Positioning

## Multistage Control

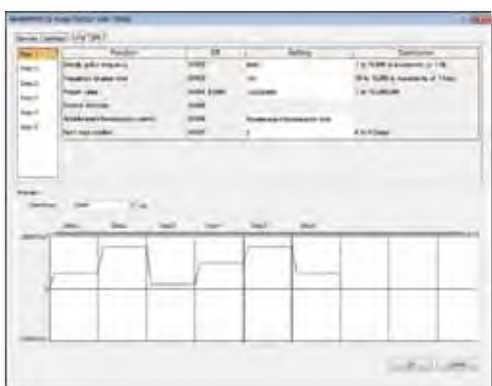
Independent dual-axis control is possible using two pulse outputs. Positioning (ramp-up/down control) can be achieved easily by setting the required values.

For applicable models, see pages 2 & 3

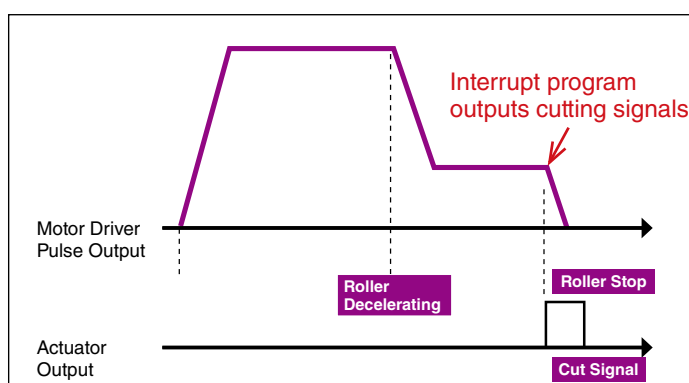
### Application example: PVC bag machine



### WindLDR: setting screen with preview



### Target frequency change programmable for 18 steps maximum



## Various Application Examples

| Applications               | Functions | 10A Relay | Analog Input | Calendar | Pulse Output | Data Logging | Ethernet Communication | User Communication | USB Communication |
|----------------------------|-----------|-----------|--------------|----------|--------------|--------------|------------------------|--------------------|-------------------|
| Elevator Control           |           | ●         |              |          | ●            |              |                        |                    |                   |
| Drain Pumps                |           | ●         | ●            | ●        |              | ●            | ●                      |                    |                   |
| Water Server               |           | ●         |              |          |              | ●            |                        | ●                  |                   |
| Coffee Server              |           | ●         | ●            |          |              | ●            |                        |                    |                   |
| Vending Machine            |           | ●         | ●            |          |              | ●            |                        |                    |                   |
| Sprinkler                  |           | ●         |              | ●        |              |              |                        | ●                  |                   |
| Mist Generator             |           |           | ●            | ●        |              |              |                        |                    |                   |
| Greenhouse Control         |           |           | ●            | ●        |              | ●            | ●                      |                    |                   |
| Coin-operated Shower       |           | ●         | ●            |          |              | ●            |                        |                    |                   |
| Golf Ball Feeder           |           |           |              |          | ●            | ●            |                        |                    |                   |
| System Status Collection   |           |           |              |          |              | ●            | ●                      |                    |                   |
| Barcode Reader             |           |           |              |          |              | ●            |                        | ●                  | ●                 |
| Ethernet Remote I/O (Note) |           |           |              |          |              |              | ●                      |                    |                   |

Note: Available soon

# SmartAXIS Programming Software

## Automation Organizer WindLDR PLC Programming Software

Pro

Lite

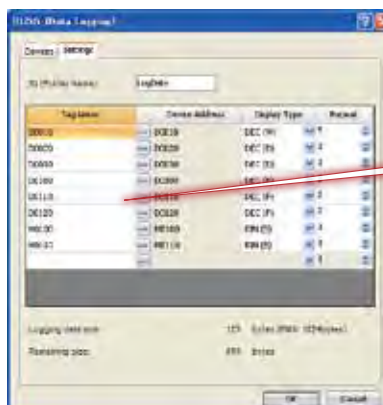
SmartAXIS Pro/Lite can be programmed using programming software WindLDR Ver. 7.0 or higher. WindLDR has a program editor, cross reference, monitor, simulation, and other functions that are required to use the SmartAXIS. WindLDR programs can also be used on the MicroSmart series PLC, making it possible to utilize existing resources effectively.

### 1. Calendar



Yearly and weekly schedule can be programmed easily using dialog setting.

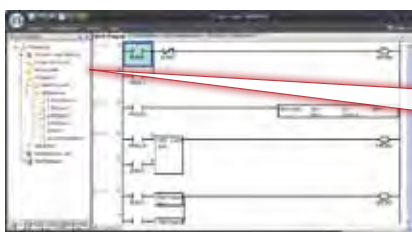
### 2. Log Setting



Log data can be configured easily.

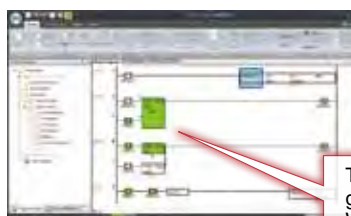
Note: Pro/Lite log data are stored in SD memory card.

### 3. Property Sheet



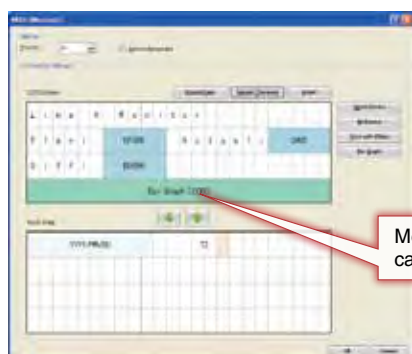
Parameters can be changed without the need to open a dialog box.

### 4. Simulation



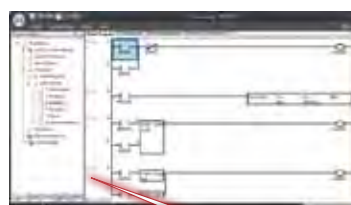
The operation of ladder programs can be confirmed on the WindLDR without connecting a PC to the SmartAXIS.

### 5. Message Instruction



Message on Pro's LCD can be programmed easily.

### 6. Program Management



Subroutine function enables creating programs depending on the program function and subject for operation.

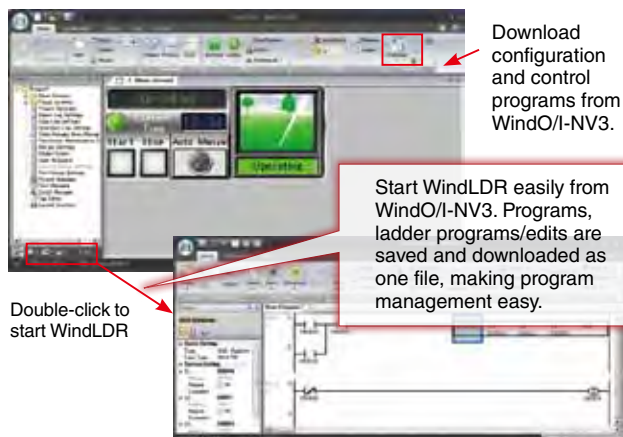
#### System Requirements

- OS Windows 7 (32-bit/64-bit), Windows Vista (32-bit), Windows XP (32-bit, Service Pack 3 or later) (Ensure that your operating system has the latest update from the Microsoft Windows Update website)
- 1.0GHz or faster CPU • Microsoft .NET Framework 3.5 • 1GB RAM • 1GB hard disk space
- Screen resolution of 1024 × 768 • Mouse, CD-ROM drive, [administrator account](#)
- \* IDEC does not guarantee that all operations will function on all personal computers satisfying the above conditions.
- \* Windows is a registered trademark of Microsoft Corporation, USA and other countries.
- \* WindLDR is included in IDEC's package software "Automation Organizer."

# Automation Organizer WindO/I-NV3 OITouchscreen Programming Software

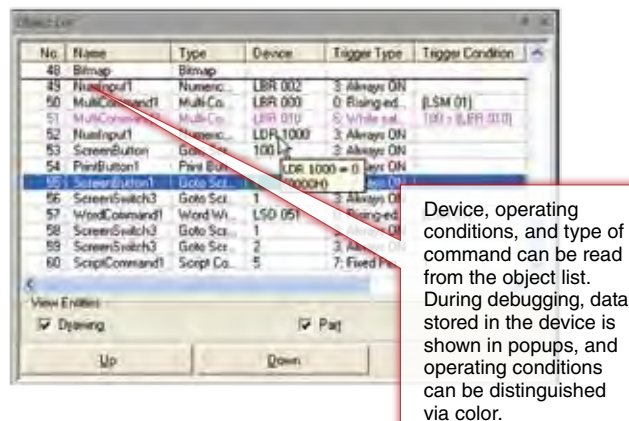
WindO/I-NV3 enables programming and also control program editing of the SmartAXIS Touch. Set HMI and control functions in just a few clicks!

## 1. Ladder program

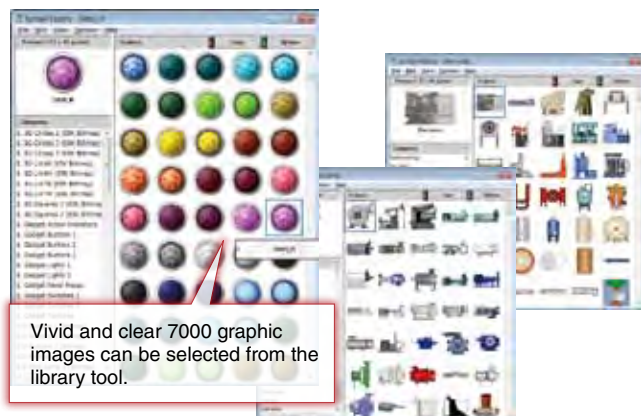


Note: Simulation is not available with WindO/I-NV3 V5.0.

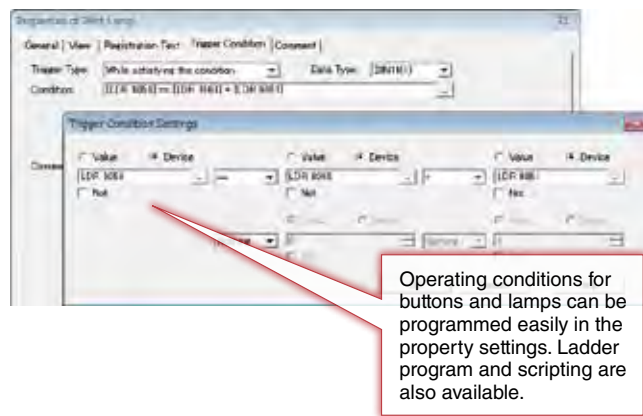
## 2. Design screens using the object list



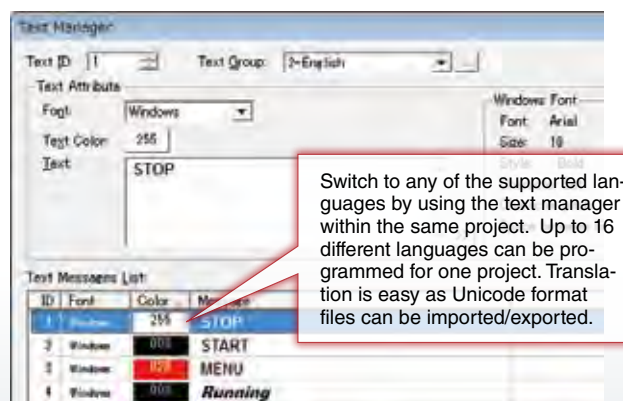
## 3. Graphic library with extensive collection of images



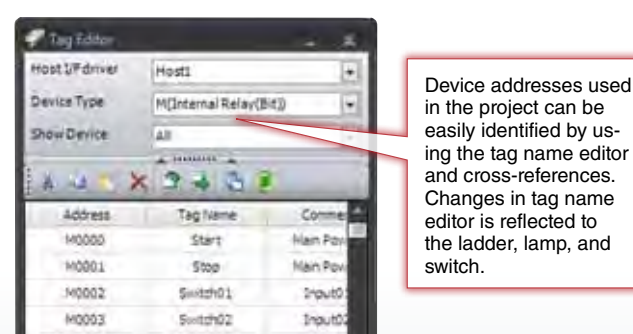
## 4. Easy programming



## 5. Create multi-language screens easily



## 6. Central control of device addresses

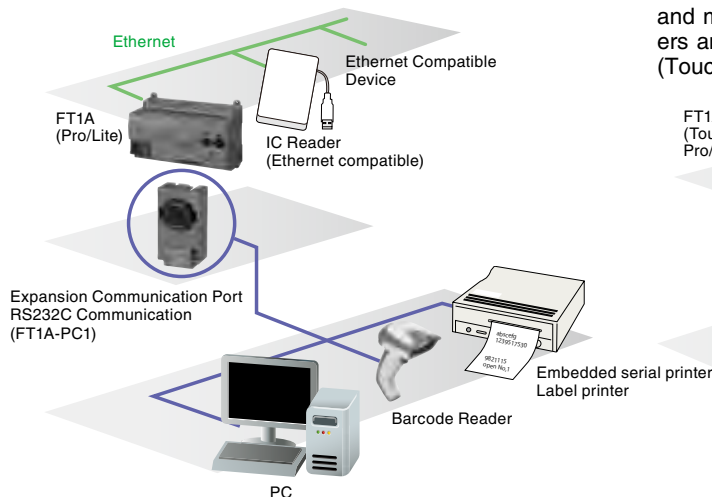


## Various Networks for a Wide Variety of Applications

(Except for 12 I/O type of Pro/Lite)

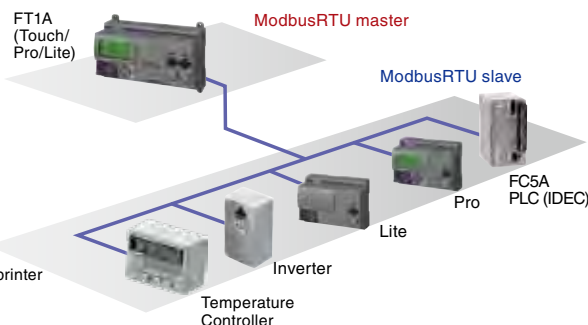
### User Communication

The user communication of the SmartAXIS enables you to control external devices such as PCs, printers, and barcode readers.



### Modbus RTU Communication

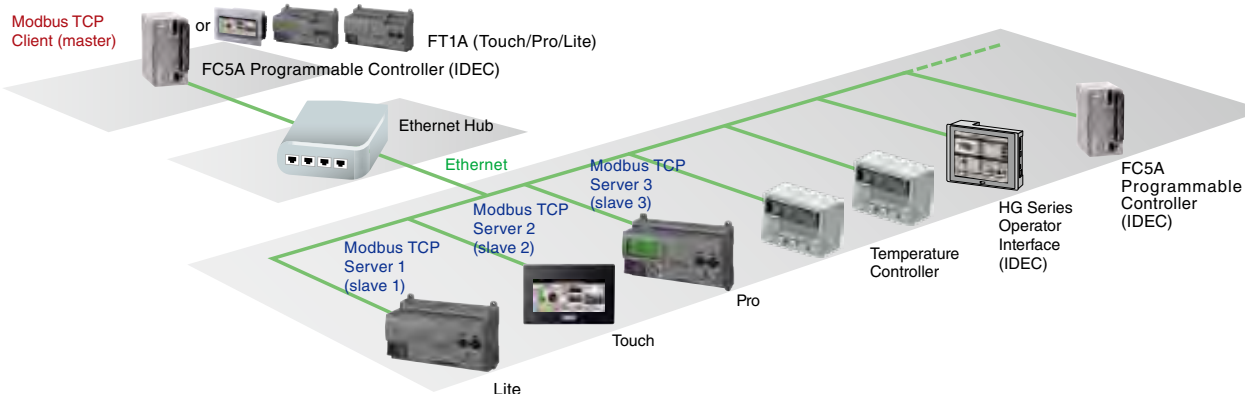
The SmartAXIS is compliant with Modbus protocol and can be used as either a Modbus communication master or slave. When used as a Modbus master, the SmartAXIS can monitor and modify data of Modbus compliant devices such as inverters and temperature controllers using Modbus communication (Touch can be used as a master only).



### Modbus TCP

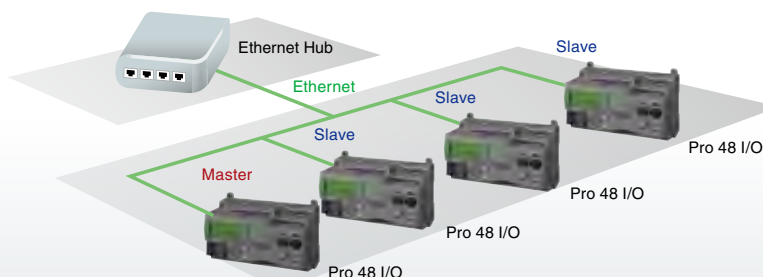
The SmartAXIS supports Modbus communications protocols. Modbus TCP protocol can also be used on the built-in Ethernet port, and can be used as a client (master) or server (slave), to monitor and change data of devices such as inverters and temperature controllers.

Note: When Pro/Lite is the client (master): up to 3 servers (slaves) can be connected.  
When Touch is the client (master): up to 16 servers (slaves) can be connected.



### Remote I/O

The remote I/O of the SmartAXIS enables you to expand the number of inputs and outputs by connecting separate SmartAXIS modules over Ethernet as remote I/O slaves. The total number of I/Os can be expanded up to 144 I/Os. The SmartAXIS remote I/O master can use the analog inputs on the remote I/O slaves (Pro/Lite only). (Available soon)



# SmartAXIS Series FT1A Controller

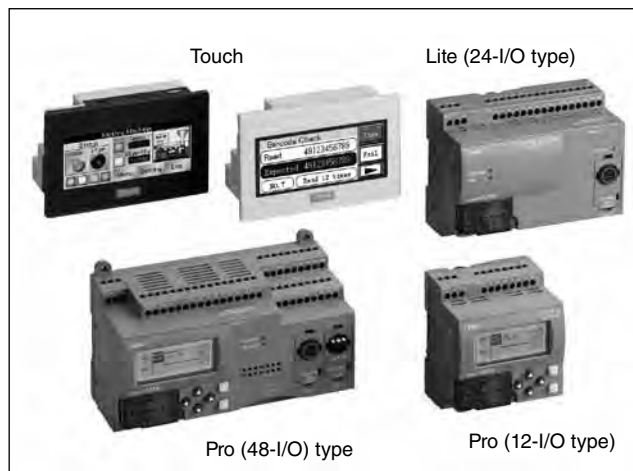
## Powerful PLC with embedded I/O.

### Touch, Pro, and Lite models for flexible use in almost all applications.

- Digital/analog-compatible input available for 24V DC. Convenient for systems requiring minimal analog inputs.
- 10A output relays connect directly to small motors and solenoid valves.
- Supports communication via RS232C, RS485, and Ethernet.
- USB programming port.
- User's program can be changed with the memory cartridge (Pro/Lite) or USB memory (Touch).



SmartAXIS will be in conformance with RCM (C-Tick).



### Touch (Display model)

- By integrating the control function (same functionality as Lite 12-I/O type) with a small display, a connected device is not needed. Wire and space-saving features offer the ideal solution for cost- and time-savings.
- Touch is an advanced small display with integrated control function.
- 400cd/m<sup>2</sup> high-contrast and 65,536 color high-resolution TFT LCD provides unparalleled visibility.
- Adjustable LED brightness function.
- Monochrome STN models are equipped with a 740 cd/m<sup>2</sup> brightness LCD and backlit with a choice of 3 colors (pink, red, white), providing practically the same brightness as the color LCD models.
- Program both the Pro and Lite models using WindLDR and the Touch model using WindO/I-NV3. Our intuitive programming software that is easy even for the first-time users.



**Touch (dark gray)**  
(photo: FT1A-\*12RA-B)



**Touch (light gray)**  
(photo: FT1A-\*12RA-W)

### Pro (LCD Model) / Lite (No LCD Model)

- Parameters such as counters and timers can be adjusted using the LCD and six operations buttons (also available on Touch).
- Monitor screens on LCD show system status and settings. "I/O status monitor" screen for monitoring I/O status "Device monitor" screen for monitoring SmartAXIS device values "Ladder Monitor" screen for monitoring the operating ladder program "Status monitor" screen: also useful for confirming protection status and scan time The states of four operation buttons can be used as digital inputs in the user programs.
- Supports positioning control with a single-phase (100 kHz)/4 point or a single-phase (100 kHz)/two-phase (50 kHz)/2 point high-speed counter input and 100 kHz/2 point pulse output. The new ARAMP instruction and enables you to program complex positioning systems easily.
- Integrated data logging function using an SD memory card. Logged data is useful for system maintenance management. (Touch: available using USB memory)
- Lite (No LCD) is available, offering more options for product selection.



**Pro**  
(photo: FT1A-H48KC when using communication cartridge)



**Lite**  
(photo: FT1A-B24RA when using communication cartridge)

## FT1A

### Touch (Display Models)

Package Quantity: 1

| Power  | I/O             | Input       |                     | Output                    | Program Size                        | Interfaces                                             | LCD            | Bezel Color | Part No.     |
|--------|-----------------|-------------|---------------------|---------------------------|-------------------------------------|--------------------------------------------------------|----------------|-------------|--------------|
|        |                 | Digital I/O | Analog I/O (Note 1) |                           |                                     |                                                        |                |             |              |
| 24V DC | 12 points (8/4) | 6           | 2                   | 4 points 10A relay output | 5 MB (Including 48 KB control data) | USB-A<br>USB-mini B<br>RS232C<br>RS422/485<br>Ethernet | STN monochrome | Light gray  | FT1A-M12RA-W |
|        |                 |             |                     |                           |                                     |                                                        |                | Dark gray   | FT1A-M12RA-B |
|        |                 |             |                     |                           |                                     |                                                        |                | Silver      | FT1A-M12RA-S |
|        |                 |             |                     |                           |                                     |                                                        | TFT color      | Light gray  | FT1A-C12RA-W |
|        |                 |             |                     |                           |                                     |                                                        |                | Dark gray   | FT1A-C12RA-B |
|        |                 |             |                     |                           |                                     |                                                        |                | Silver      | FT1A-C12RA-S |

### Pro (LCD Models)

Package Quantity: 1

| Power          | I/O               | Input        |                     | Output | High-Speed Tr. Output                                  | Program Size | Interfaces      |               |                                       |   |                  | Part No.   |                |                                                      |             |
|----------------|-------------------|--------------|---------------------|--------|--------------------------------------------------------|--------------|-----------------|---------------|---------------------------------------|---|------------------|------------|----------------|------------------------------------------------------|-------------|
|                |                   | Digital I/O  | Analog I/O (Note 1) |        |                                                        |              | USB mini-B Port | Ethernet Port | Expansion communication port (Note 2) |   | Memory Cartridge |            | SD Memory Card |                                                      |             |
| 24V DC         | 12 points (8/4)   | 24V DC Input | 6                   | 2      | 4 points 10A relay output                              | —            | 12 KB           | —             | —                                     | — | —                | —          | FT1A-H12RA     |                                                      |             |
|                | 24 points (16/8)  |              | 12                  | 4      | 4 points 10A relay output<br>4 points 2A relay output  | ×            |                 |               | 48 KB                                 | × | ×                |            | ×              | FT1A-H24RA                                           |             |
|                | 40 points (24/16) |              | 18                  | 6      | 4 points 10A relay output<br>8 points 2A relay output  |              |                 |               |                                       |   |                  |            |                | 4 points Tr sink output<br>4 points Tr source output | FT1A-H40RKA |
|                | 48 points (30/18) |              | 22                  | 8      | 18 points Tr sink output                               |              |                 |               |                                       |   |                  |            |                | FT1A-H40RSA                                          |             |
|                |                   |              |                     |        | 18 points Tr source output                             |              |                 |               |                                       |   |                  |            |                | FT1A-H48KA                                           |             |
|                |                   |              |                     |        |                                                        |              |                 |               |                                       |   |                  |            |                | FT1A-H48SA                                           |             |
| 100 to 240V AC | 12 points (8/4)   | 24V DC Input | 8                   | —      | 4 points 10A relay output                              | —            | 12 KB           | —             | —                                     | — | —                | FT1A-H12RC |                |                                                      |             |
|                | 24 points (16/8)  |              | 16                  |        | 4 points 10A relay output<br>4 points 2A relay output  | 48 KB        |                 |               | ×                                     | × |                  | ×          | ×              | FT1A-H24RC                                           |             |
|                | 40 points (24/16) |              | 24                  |        | 4 points 10A relay output<br>12 points 2A relay output |              |                 |               |                                       |   |                  |            |                | FT1A-H40RC                                           |             |
|                | 48 points (30/18) |              | 30                  |        | 18 points Tr sink output                               |              |                 |               |                                       |   |                  |            |                | ×                                                    | FT1A-H48KC  |
|                |                   |              |                     |        | 18 points Tr source output                             |              |                 |               |                                       |   |                  |            |                |                                                      | FT1A-H48SC  |
|                |                   |              |                     |        |                                                        |              |                 |               |                                       |   |                  |            |                |                                                      |             |

### Lite (No LCD Models)

Package Quantity: 1

| Power          | I/O               | Input        |                     | Output | High-Speed Tr. Output                                  | Program Size | Interfaces      |               |                                       |        |                  | Part No. |                |                                                      |   |   |             |
|----------------|-------------------|--------------|---------------------|--------|--------------------------------------------------------|--------------|-----------------|---------------|---------------------------------------|--------|------------------|----------|----------------|------------------------------------------------------|---|---|-------------|
|                |                   | Digital I/O  | Analog I/O (Note 1) |        |                                                        |              | USB mini-B Port | Ethernet Port | Expansion communication port (Note 2) |        | Memory Cartridge |          | SD Memory Card |                                                      |   |   |             |
|                |                   |              |                     |        |                                                        |              |                 |               | Port 2                                | Port 3 |                  |          |                |                                                      |   |   |             |
| 24V DC         | 12 points (8/4)   | 24V DC Input | 6                   | 2      | 4 points 10A relay output                              | —            | 12 KB           | —             | —                                     | —      | —                | —        | FT1A-B12RA     |                                                      |   |   |             |
|                | 24 points (16/8)  |              | 12                  | 4      | 4 points 10A relay output<br>4 points 2A relay output  | ×            | 48 KB           |               | ×                                     | ×      |                  |          | ×              | FT1A-B24RA                                           |   |   |             |
|                | 40 points (24/16) |              | 18                  | 6      | 4 points 10A relay output<br>8 points 2A relay output  |              |                 |               |                                       |        |                  |          |                | 4 points Tr sink output<br>4 points Tr source output | × | × | FT1A-B40RKA |
|                | 48 points (30/18) |              | 22                  | 8      | 18 points Tr sink output<br>18 points Tr source output |              |                 |               |                                       |        |                  |          |                | FT1A-B40RSA                                          |   |   |             |
|                |                   |              |                     |        |                                                        |              |                 |               |                                       |        |                  |          |                | FT1A-B48KA                                           |   |   |             |
|                |                   |              |                     |        |                                                        |              | FT1A-B48SA      |               |                                       |        |                  |          |                |                                                      |   |   |             |
| 100 to 240V AC | 12 points (8/4)   | 24V DC Input | 8                   | —      | 4 points 10A relay output                              | —            | 12 KB           | —             | —                                     | —      | —                | —        | FT1A-B12RC     |                                                      |   |   |             |
|                | 24 points (16/8)  |              | 16                  |        | 4 points 10A relay output<br>4 points 2A relay output  | —            | 48 KB           |               | ×                                     | ×      |                  |          | ×              | FT1A-B24RC                                           |   |   |             |
|                | 40 points (24/16) |              | 24                  |        | 4 points 10A relay output<br>12 points 2A relay output |              |                 |               |                                       |        |                  |          |                | ×                                                    | × | × | FT1A-B40RC  |
|                | 48 points (30/18) |              | 30                  |        | 18 points Tr sink output<br>18 points Tr source output |              |                 |               |                                       |        |                  |          |                |                                                      |   |   | FT1A-B48KC  |
|                |                   |              |                     |        |                                                        |              |                 |               |                                       |        |                  |          |                | FT1A-B48SC                                           |   |   |             |
|                |                   |              |                     |        |                                                        |              |                 |               |                                       |        |                  |          |                |                                                      |   |   |             |

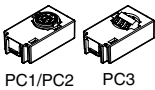
Note 1: Digital/analog-compatible input

Note 2: The following communication cartridges can be connected.

FT1A-PC1: RS232C, mini-DIN type, FT1A-PC2: RS485, mini-DIN type, FT1A-PC3: RS485, terminal block type

## Options / Maintenance Parts

### Options

| Name/Appearance                                                                                           | Applicable Model |     |      | Part No.<br>(Ordering No.) | Package<br>Quantity | Specifications                                   |
|-----------------------------------------------------------------------------------------------------------|------------------|-----|------|----------------------------|---------------------|--------------------------------------------------|
|                                                                                                           | Touch            | Pro | Lite |                            |                     |                                                  |
| Application software                                                                                      | ×                | ×   | ×    | SW1A-W1C                   | 1                   | Automation Organizer Ver. 2.0 or higher (Note 1) |
| USB maintenance cable    | ×                | ×   | ×    | HG9Z-XCM42                 | 1                   | USB cable (length 2 m), USB-miniB                |
| Panel mount extension cable                                                                               | ×                | —   | —    | HG9Z-XCE11                 | 1                   | USB-A port extension cable (length 1 m)          |
|                                                                                                           | ×                | ×   | ×    | HG9Z-XCE21                 | 1                   | USB-mini B port extension cable (length 1 m)     |
| Screen protection sheet (Note 2)                                                                          | ×                | —   | —    | FT9Z-1D3PN05               | 5                   |                                                  |
| Protective cover                                                                                          | ×                | —   | —    | FT9Z-1E3PN05               | 5                   |                                                  |
| Memory card              | —<br>(Note 3)    | ×   | ×    | HG9Z-XMS2                  | 1                   | SD memory card (2 GB)                            |
| Memory cartridge         | —                | ×   | ×    | FT1A-PM1                   | 1                   | Dedicated user program save memory (1 MB)        |
| Communication cartridge  | —                | ×   | ×    | FT1A-PC1                   | 1                   | RS232C, mini-DIN type                            |
|                                                                                                           | —                | ×   | ×    | FT1A-PC2                   | 1                   | RS485, mini-DIN type                             |
|                                                                                                           | —                | ×   | ×    | FT1A-PC3                   | 1                   | RS485, terminal block type                       |
| Rear mount adapter                                                                                        | ×                | —   | —    | FT9Z-1A01                  | 1                   | Rear mount bracket                               |
| 35-mm-wide DIN Rail                                                                                       | —                | ×   | ×    | BAA1000PN10                | 10                  | Aluminum, 1000mm long, 200g (approx.)            |
|                                                                                                           | —                | ×   | ×    | BAP1000PN10                | 10                  | Steel, 1000mm long, 200g (approx.)               |
| DIN rail mounting bracket                                                                                 | —                | ×   | ×    | BNL6PN10                   | 10                  | DIN rail bracket                                 |
| Touch User's Manual                                                                                       | Japanese         | ×   | —    | FT9Y-B1389                 | 1                   |                                                  |
|                                                                                                           | English          | ×   | —    | FT9Y-B1390                 | 1                   |                                                  |
| Pro/Lite User's Manual                                                                                    | Japanese         | —   | ×    | FT9Y-B1377                 | 1                   |                                                  |
|                                                                                                           | English          | —   | ×    | FT9Y-B1378                 | 1                   |                                                  |
| SmartAXIS Ladder Programming Manual                                                                       | Japanese         | ×   | ×    | FT9Y-B1381                 | 1                   |                                                  |
|                                                                                                           | English          | ×   | ×    | FT9Y-B1382                 | 1                   |                                                  |

Note 1: Upgrade from earlier version is possible on IDEC website. The following manuals in PDF can be downloaded from IDEC website.

FT1A SmartAXIS Touch User's Manual (English, Japanese, Simplified Chinese)

FT1A SmartAXIS Pro/Lite User's Manual (English, German, Japanese, Simplified Chinese)

FT1A SmartAXIS Ladder Programming Manual (English, German, Japanese, Simplified Chinese)

Note 2: UV resistance material is used. However, resistance against direct sunlight in outdoor usage is not guaranteed.

Note 3: Use commercially-available USB memory to store project data, log data, and recipe file of Touch models.

Note 4: Can be used for 40-I/O and 48-I/O types. Note that user programs cannot be stored or read using an SD memory card. If necessary, use a memory cartridge.

Note 5: Cannot be used for expansion with 12-I/O type.

### Maintenance Parts

| Name                                                                                                             | Applicable Model |     |      | Part No.<br>(Ordering No.) | Package<br>Quantity | Specification                                    |
|------------------------------------------------------------------------------------------------------------------|------------------|-----|------|----------------------------|---------------------|--------------------------------------------------|
|                                                                                                                  | Touch            | Pro | Lite |                            |                     |                                                  |
| Communication Interface plug  | ×                | —   | —    | FT9Z-1T09                  | 1                   | For communication ports (black)                  |
| Power supply plug             | ×                | —   | —    | FT9Z-1X03                  | 1                   | For power supply terminals (black)               |
| Mounting bracket              | ×                | —   | —    | HG9Z-4K2PN04               | 4                   |                                                  |
| USB cable lock pin            | ×                | —   | —    | HG9Z-XU1PN05               | 5                   | Used when using the USB cable on a regular basis |
| Direct mounting hook          | —                | ×   | ×    | FT9Z-PSP1PN05              | 5                   | Direct mounting hook for Pro/Lite                |

## General Specifications

### Touch (Display Model)

| Part No.                               | FT1A-*12RA-*                                                                                                                                                            |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rated Power Voltage                    | 24V DC                                                                                                                                                                  |
| Allowable Voltage Range                | 20.4 to 28.8V DC (including ripple)                                                                                                                                     |
| Power Consumption                      | 9.2W maximum                                                                                                                                                            |
| Allowable Momentary Power Interruption | 10 ms maximum                                                                                                                                                           |
| Dielectric Strength                    | 1. Between power terminal and FG: 500V AC, 5 mA, 1 minute<br>2. Between power terminal and output terminal: 2,300V AC, 5 mA, 1 minute                                   |
| EMC Immunity                           | IEC/EN 61131-2:2007 compliant                                                                                                                                           |
| Inrush Current                         | 50A maximum (5ms maximum)                                                                                                                                               |
| Operating Temperature                  | 0 to +50°C                                                                                                                                                              |
| Storage Temperature                    | -20 to +60°C (no freezing)                                                                                                                                              |
| Relative Humidity                      | 10 to 95% RH (no condensation)                                                                                                                                          |
| Pollution Degree                       | 2 (IEC 60664-1)                                                                                                                                                         |
| Corrosion Immunity                     | Atmosphere free from corrosive gases                                                                                                                                    |
| Degree of Protection                   | IP66F (Panel front) (Note 1)<br>IP20 (Rear)                                                                                                                             |
| Ground                                 | Functional grounding                                                                                                                                                    |
| Protective grounding conductor         | AWG16                                                                                                                                                                   |
| Vibration Resistance                   | 5 to 8.4 Hz half amplitude 3.5 mm, 8.4 to 150 Hz,<br>Acceleration 9.8 m/s <sup>2</sup> (1G) 2 hours per axis on each of three mutually perpendicular axis (IEC 61131-2) |
| Shock Resistance                       | 147 m/s <sup>2</sup> , 11 ms, X, Y, Z directions 3 times (IEC 61131-2)                                                                                                  |
| Mounting Structure                     | Panel mount                                                                                                                                                             |
| Weight (approx.)                       | 300g                                                                                                                                                                    |

Note 1: Operation not guaranteed when used with certain types of oils.

### Pro/Lite (LCD Model/No LCD Model)

| Part No.                               |          | Pro/Lite                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                           |  |                                                           |  |                                                                   |  |
|----------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------|--|-----------------------------------------------------------|--|-------------------------------------------------------------------|--|
|                                        |          | 12-I/O Type<br>H12RC H12RA<br>B12RC B12RA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | 24-I/O Type<br>H24RC H24RA<br>B24RC B24RA |  | 40-I/O Type<br>H40RC H40RKA H40RSA<br>B40RC B40RKA B40RSA |  | 48-I/O Type<br>H48KC H48SC H48KA H48SA<br>B48KC B48SC B48KA B48SA |  |
| Rated Power Voltage                    |          | AC power: 100 to 240V AC<br>DC power: 24V DC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                           |  |                                                           |  |                                                                   |  |
| Allowable Voltage Range                |          | AC power: 85 to 264V AC<br>DC power: 20.4 to 28.8V DC (including ripple)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                           |  |                                                           |  |                                                                   |  |
| Rated Power Frequency                  |          | AC power: 50 to 60 Hz (47 to 63 Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                           |  |                                                           |  |                                                                   |  |
| Power Consumption                      | AC power | 12-I/O: 18 VA maximum, 24-I/O: 41 VA maximum, 40-I/O: 48VA maximum, 48-I/O: 43 VA maximum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                           |  |                                                           |  |                                                                   |  |
|                                        | DC power | 12-I/O: 4.3W maximum, 24-I/O: 4.8W maximum, 40-I/O: 7.9W maximum, 48-I/O: 6.0W maximum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                           |  |                                                           |  |                                                                   |  |
| Allowable Momentary Power Interruption |          | AC power: 20 ms maximum<br>DC power: 10 ms maximum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                                           |  |                                                           |  |                                                                   |  |
| Dielectric Strength                    |          | AC power type: Between power/input and PE terminals: 1,500V AC, 1 minute<br>Between transistor output and PE terminals: 1,500V AC, 1 minute<br>Between relay output and PE terminals: 2,300V AC, 1 minute<br>Between power and input terminals: 1,500V AC, 1 minute<br>Between power/input and transistor output terminals: 1,500V AC, 1 minute<br>Between power/input and relay output terminals: 2,300V AC, 1 minute<br>DC power type: Between power/input and FE terminals: 500V AC, 1 minute<br>Between transistor output and FE terminals: 500V AC, 1 minute<br>Between relay output and FE terminals: 2,300V AC, 1 minute<br>Between power/input and transistor output terminals: 500V AC, 1 minute<br>Between power/input and relay output terminals: 2,300V AC, 1 minute |  |                                           |  |                                                           |  |                                                                   |  |
| EMC Immunity                           |          | IEC/EN 61131-2:2007 compliant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                           |  |                                                           |  |                                                                   |  |
| Inrush Current                         |          | AC power: 35A maximum (Cold start with Ta=25°C, 200V AC)<br>DC power: 30A maximum (5ms maximum)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                           |  |                                                           |  |                                                                   |  |
| Operating Temperature                  |          | 0 to +55°C (Note)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                                           |  |                                                           |  |                                                                   |  |
| Storage Temperature                    |          | -25 to +70°C (no freezing)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                           |  |                                                           |  |                                                                   |  |
| Relative Humidity                      |          | 10 to 95% RH (no condensation)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                                           |  |                                                           |  |                                                                   |  |
| Pollution Degree                       |          | 2 (IEC 60664-1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                           |  |                                                           |  |                                                                   |  |
| Corrosion Immunity                     |          | Atmosphere free from corrosive gases                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |                                           |  |                                                           |  |                                                                   |  |
| Degree of Protection                   |          | IP20 (IEC 60529)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                                           |  |                                                           |  |                                                                   |  |
| Ground                                 |          | D-type ground (Class 3 ground)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                                           |  |                                                           |  |                                                                   |  |
| Protective grounding conductor         |          | UL1007 AWG16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                           |  |                                                           |  |                                                                   |  |
| Vibration Resistance                   |          | 5 to 8.4 Hz half amplitude 3.5 mm, 8.4 to 150 Hz,<br>Acceleration 9.8 m/s <sup>2</sup> (1G) 2 hours per axis on each of three mutually perpendicular axis (IEC 61131-2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                           |  |                                                           |  |                                                                   |  |
| Shock Resistance                       |          | 147 m/s <sup>2</sup> , 11 ms, X, Y, Z directions 3 times (IEC 61131-2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                           |  |                                                           |  |                                                                   |  |
| Mounting Structure                     |          | DIN rail or direct mount                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                           |  |                                                           |  |                                                                   |  |
| Weight (approx.)                       | AC power | 12-I/O: 230g, 24-I/O: 400g, 40-I/O: 580g, 48-I/O: 540g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                           |  |                                                           |  |                                                                   |  |
|                                        | DC power | 12-I/O: 190g, 24-I/O: 310g, 40-I/O: 420g, 48-I/O: 380g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                           |  |                                                           |  |                                                                   |  |

Note: UL, c-UL Listed at 0 to +50°C (FT1A Version V110)

## Function Specifications (Touch/Pro/Lite)

| Part No.                                |                                       |                             | Touch                                                                                                                                                                                                                                                            |                                                                    | Pro/Lite FT1A-                               |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
|-----------------------------------------|---------------------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------|---------------------|--------------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|----------------------------------|----------------------------------|
|                                         |                                       |                             | FT1A-~12RA-~                                                                                                                                                                                                                                                     |                                                                    | H12RA<br>B12RA                               | H12RC<br>B12RC                                                     | H24RC<br>B24RC      | H24RA<br>B24RA                                                     | H40RKA<br>H40RSA<br>B40RKA<br>B40RSA               | H40RC<br>B40RC                                                     | H48KA<br>H48SA<br>B48KA<br>B48SA | H48KC<br>H48SC<br>B48KC<br>B48SC |
| Control System                          |                                       |                             | Stored program system                                                                                                                                                                                                                                            |                                                                    |                                              |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
| Instruction Words                       | Basic Instructions                    |                             | 42 types                                                                                                                                                                                                                                                         |                                                                    |                                              |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
|                                         | Advanced Instructions                 |                             | 97 types                                                                                                                                                                                                                                                         |                                                                    | 99 types                                     |                                                                    | 107 types           |                                                                    | DC power type: 125 types, AC power type: 111 types |                                                                    |                                  |                                  |
| Program Capacity                        |                                       |                             | Program size: 48 KB<br>Configuration memory capacity: 5 MB                                                                                                                                                                                                       |                                                                    | 12 KB                                        |                                                                    | 48 KB               |                                                                    |                                                    |                                                                    |                                  |                                  |
| User Program Storage                    |                                       |                             | Flash ROM (100,000 times)                                                                                                                                                                                                                                        |                                                                    | Built-in Flash ROM (10,000 times rewritable) |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
| Processing Time                         | Basic Instruction                     |                             | 1850μs/1000 steps                                                                                                                                                                                                                                                |                                                                    | 950 μs/1000 steps                            |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
|                                         | END Processing                        |                             | 5 msec minimum                                                                                                                                                                                                                                                   |                                                                    | 2 ms (Pro) / 640 μs (Lite)                   |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
| I/O Points                              | Inputs                                |                             | 8                                                                                                                                                                                                                                                                |                                                                    | 8                                            |                                                                    | 16                  |                                                                    | 24                                                 |                                                                    | 30                               |                                  |
|                                         | Outputs                               |                             | 4                                                                                                                                                                                                                                                                |                                                                    | 4                                            |                                                                    | 8                   |                                                                    | 16                                                 |                                                                    | 18                               |                                  |
| Internal Relays                         |                                       |                             | 1024                                                                                                                                                                                                                                                             |                                                                    | 256                                          |                                                                    | 1024                |                                                                    |                                                    |                                                                    |                                  |                                  |
| Shift Registers                         |                                       |                             | 128                                                                                                                                                                                                                                                              |                                                                    | 128                                          |                                                                    | 128                 |                                                                    |                                                    |                                                                    |                                  |                                  |
| Data Registers                          |                                       |                             | 2000                                                                                                                                                                                                                                                             |                                                                    | 400                                          |                                                                    | 2000                |                                                                    |                                                    |                                                                    |                                  |                                  |
| Special Data Registers                  |                                       |                             | 200                                                                                                                                                                                                                                                              |                                                                    | 200                                          |                                                                    | 200                 |                                                                    |                                                    |                                                                    |                                  |                                  |
| Adding/Reversible Counters              |                                       |                             | 200                                                                                                                                                                                                                                                              |                                                                    | 100                                          |                                                                    | 200                 |                                                                    |                                                    |                                                                    |                                  |                                  |
| Timer (1ms, 10 ms, 10 ms, 1s)           |                                       |                             | 200                                                                                                                                                                                                                                                              |                                                                    | 100                                          |                                                                    | 200                 |                                                                    |                                                    |                                                                    |                                  |                                  |
| Clock                                   |                                       |                             | Precision: ±30 seconds/month (25°C, typical)                                                                                                                                                                                                                     |                                                                    |                                              |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
| RAM Backup                              | Backup Data                           |                             | Internal relays, shift registers, counters, data registers, clock data                                                                                                                                                                                           |                                                                    |                                              |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
|                                         | Backup Duration                       |                             | Approximately 30 days (typical) at 25°C after backup battery is fully charged                                                                                                                                                                                    |                                                                    |                                              |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
|                                         | Battery                               |                             | Lithium secondary battery                                                                                                                                                                                                                                        |                                                                    |                                              |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
|                                         | Charging Time                         |                             | Approximately 15 hours required to charge from 0 to 90%                                                                                                                                                                                                          |                                                                    |                                              |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
|                                         | Replaceability                        |                             | Not possible                                                                                                                                                                                                                                                     |                                                                    |                                              |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
| Self-Diagnostic Functions               |                                       |                             | Keep data check, power failure check, clock error check, watchdog timer check, timer/counter preset value change error check, user program syntax check, user program execution check, system error check, memory cartridge transfer error check (Pro/Lite only) |                                                                    |                                              |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
| Input Filter                            |                                       |                             | No filter, 3 to 15 ms (selectable in increments of 1 ms)                                                                                                                                                                                                         |                                                                    |                                              |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
| Catch Input/Interrupt Input             |                                       |                             | 4/4                                                                                                                                                                                                                                                              |                                                                    | 4/4                                          |                                                                    | 6/6                 |                                                                    |                                                    |                                                                    |                                  |                                  |
| High-speed Counter                      | Maximum Counting Frequency and Points | Single/two-phase selectable | 1 (5 kHz, multiple 2/4, single-phase cannot be used)                                                                                                                                                                                                             | 2 (100 kHz when single-phase, 50 kHz when two-phase, multiple 2.4) | —                                            | 2 (100 kHz when single-phase, 50 kHz when two-phase, multiple 2.4) | —                   | 2 (100 kHz when single-phase, 50 kHz when two-phase, multiple 2.4) | —                                                  | 2 (100 kHz when single-phase, 50 kHz when two-phase, multiple 2.4) | —                                |                                  |
|                                         |                                       | Single-phase                | 4 (x 10 kHz)                                                                                                                                                                                                                                                     | 2 (x 100 kHz)                                                      | —                                            | 4 (x 100 kHz)                                                      | —                   | 4 (x 100 kHz)                                                      | —                                                  | 4 (x 100 kHz)                                                      | —                                |                                  |
|                                         | Counting Range                        |                             | 0 to 4,294,967,295 (32 bits)                                                                                                                                                                                                                                     |                                                                    |                                              |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
|                                         | Operation Mode                        |                             | Rotary encoder mode and adding counter mode                                                                                                                                                                                                                      |                                                                    |                                              |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
| Analog Voltage Inputs                   | Points                                |                             | 2                                                                                                                                                                                                                                                                | 2                                                                  | None                                         | 4                                                                  | None                | 6                                                                  | None                                               | 8                                                                  | None                             |                                  |
|                                         | Input Range                           |                             | 0 to 10V DC                                                                                                                                                                                                                                                      |                                                                    |                                              |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
|                                         | Input Impedance                       |                             | 78 kΩ                                                                                                                                                                                                                                                            |                                                                    |                                              |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
|                                         | Digital Resolution                    |                             | 10-bit (0 to 1000)                                                                                                                                                                                                                                               |                                                                    |                                              |                                                                    |                     |                                                                    |                                                    |                                                                    |                                  |                                  |
| Pulse Outputs                           | 100 kHz                               | No. of outputs              | —                                                                                                                                                                                                                                                                | —                                                                  | —                                            | —                                                                  | —                   | 2                                                                  | —                                                  | 2                                                                  | 2                                |                                  |
|                                         |                                       | Function                    | —                                                                                                                                                                                                                                                                | —                                                                  | —                                            | —                                                                  | —                   | PULS, PWM, RAMP, ARAMP, ZRN                                        | —                                                  | PULS, PWM, RAMP, ARAMP, ZRN                                        | —                                |                                  |
|                                         | 5 kHz                                 | No. of outputs              | —                                                                                                                                                                                                                                                                | —                                                                  | —                                            | —                                                                  | —                   | 2                                                                  | —                                                  | 2                                                                  | 2                                |                                  |
|                                         |                                       | Function                    | —                                                                                                                                                                                                                                                                | —                                                                  | —                                            | —                                                                  | —                   | PULS, PWM                                                          | —                                                  | PULS, PWM                                                          | —                                |                                  |
| External Output Power Supply for Sensor | Output Voltage                        |                             | —                                                                                                                                                                                                                                                                | —                                                                  | —                                            | —                                                                  | 24V DC (+10%, -15%) | —                                                                  | 24V DC (+10%, -15%)                                | —                                                                  | 24V DC (+10%, -15%)              |                                  |
|                                         | Output Current                        |                             | —                                                                                                                                                                                                                                                                | —                                                                  | —                                            | —                                                                  | 250 mA              | —                                                                  | 300 mA                                             | —                                                                  | 300 mA                           |                                  |
|                                         | Overload Detection                    |                             | —                                                                                                                                                                                                                                                                | —                                                                  | —                                            | —                                                                  | Impossible          | —                                                                  | Impossible                                         | —                                                                  | Impossible                       |                                  |
|                                         | Insulation                            |                             | —                                                                                                                                                                                                                                                                | —                                                                  | —                                            | —                                                                  | Internal Circuit    | —                                                                  | Internal Circuit                                   | —                                                                  | Internal Circuit                 |                                  |
| USB-mini B                              |                                       |                             | ×                                                                                                                                                                                                                                                                |                                                                    | ×                                            |                                                                    | ×                   |                                                                    | ×                                                  |                                                                    | ×                                |                                  |
| USB-A                                   |                                       |                             | ×                                                                                                                                                                                                                                                                |                                                                    | —                                            |                                                                    | —                   |                                                                    | ×                                                  |                                                                    | —                                |                                  |
| RS232C                                  |                                       |                             | ×                                                                                                                                                                                                                                                                |                                                                    | —                                            |                                                                    | × (Note 1)          |                                                                    | × (Note 1)                                         |                                                                    | × (Note 1)                       |                                  |
| RS485/422                               |                                       |                             | ×                                                                                                                                                                                                                                                                |                                                                    | —                                            |                                                                    | × (Note 1)          |                                                                    | × (Note 1)                                         |                                                                    | × (Note 1)                       |                                  |
| Ethernet                                |                                       |                             | ×                                                                                                                                                                                                                                                                |                                                                    | —                                            |                                                                    | ×                   |                                                                    | ×                                                  |                                                                    | ×                                |                                  |
| Expansion Communication Ports           | Port 2                                |                             | —                                                                                                                                                                                                                                                                |                                                                    | —                                            |                                                                    | ×                   |                                                                    | ×                                                  |                                                                    | ×                                |                                  |
|                                         | Port 3                                |                             | —                                                                                                                                                                                                                                                                |                                                                    | —                                            |                                                                    | —                   |                                                                    | ×                                                  |                                                                    | ×                                |                                  |
| Memory Cartridge                        |                                       |                             | —                                                                                                                                                                                                                                                                |                                                                    | ×                                            |                                                                    | ×                   |                                                                    | ×                                                  |                                                                    | ×                                |                                  |
| SD Memory Card                          |                                       |                             | —                                                                                                                                                                                                                                                                |                                                                    | —                                            |                                                                    | —                   |                                                                    | × (Note 2)                                         |                                                                    | × (Note 2)                       |                                  |

Note 1: When communication cartridge is installed. Note 2: The maximum capacity is 32 GB. DLOG and TRACE instructions are used to write data.

## Display Specifications

### Touch/Pro (Display Model/Built-in LCD)

| Part No.                |             | Touch                                                                                                                                          |                                | Pro                                                                                          |
|-------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------------------------------------------------------------------------|
| Display Element         |             | TFT color LCD                                                                                                                                  | STN monochrome LCD             | STN monochrome LCD                                                                           |
| Colors/Shades           |             | 65,536 colors                                                                                                                                  | Monochrome 8 shades            | Monochrome                                                                                   |
| Effective Display Area  |             | 88.92 W x 37.05 H mm                                                                                                                           | 87.59 W x 35.49 H mm           | 47.98 W x 18.22 H mm                                                                         |
| Display Resolution      |             | 240 W x 100 H pixels                                                                                                                           |                                | 192 W x 64 H pixels                                                                          |
| View Angle              |             | Left/right 40°, top 20°, bottom 60°                                                                                                            | Left/right/top/bottom: 45°     | Left/right 30°, top 20°, bottom 40°                                                          |
| Contrast Adjustment     |             | Not possible                                                                                                                                   | 32 levels                      | Not possible                                                                                 |
| Backlight               |             | LED                                                                                                                                            | LED (white, red, pink)         | LED (green)                                                                                  |
| Backlight Life          |             | 50,000 hours (Note 1)                                                                                                                          |                                | —                                                                                            |
| Brightness              |             | 400 cd/m <sup>2</sup> (Note 2)                                                                                                                 | 740 cd/m <sup>2</sup> (Note 2) | 45 cd/m <sup>2</sup>                                                                         |
| Brightness Adjustment   |             | 32 levels                                                                                                                                      |                                | Not possible                                                                                 |
| Backlight Control       |             | Auto off function                                                                                                                              |                                | On/off                                                                                       |
| Backlight Replacement   |             | Not possible                                                                                                                                   |                                |                                                                                              |
| Display Character Size  | 1/4 Size    | 8 x 8 pixels [Japanese Katakana, JIS 8-bit code, ISO 8859-1 (Latin 1), ANSI 1250 (central Europe) ], ANSI 1257 (Baltic), ANSI 1251 (Cyrillic)  |                                | —                                                                                            |
|                         | 1/2 Size    | 8 x 16 pixels [Japanese Katakana, JIS 8-bit code, ISO 8859-1 (Latin 1), ANSI 1250 (central Europe) ], ANSI 1257 (Baltic), ANSI 1251 (Cyrillic) |                                | 8 x 16 pixels [Japanese Katakana, JIS 8-bit code, ISO 8859-1 (Latin 1), ANSI 1251 (Cyrillic) |
|                         |             | 16 x 32 pixels, 24 x 48 pixels, 32 x 64 pixels<br>(Western European languages: ISO 8859-1)                                                     |                                | —                                                                                            |
|                         | Full Size   | 16 x 16 pixels (Japanese JIS first and second level characters, simplified Chinese, traditional Chinese, Korean)                               |                                | 16 x 16 pixels<br>(Japanese JIS first level characters, Chinese)                             |
|                         | Double Size | 32 x 32 pixels (Japanese JIS first level characters, Mincho font)                                                                              |                                | —                                                                                            |
| No. of Characters       | 1/4 Size    | 30 characters x 12 lines/screen                                                                                                                |                                | —                                                                                            |
|                         | 1/2 Size    | 30 characters x 6 lines/screen                                                                                                                 |                                | 24 characters x 4 lines                                                                      |
|                         | Full Size   | 15 characters x 6 lines/screen                                                                                                                 |                                | 12 characters x 4 lines                                                                      |
|                         | Double Size | 7 characters x 3 lines/screen                                                                                                                  |                                | —                                                                                            |
| Character Magnification |             | 0.5x, 1x, 2x, 3x, 4x, 8x vertically and horizontally                                                                                           |                                | —                                                                                            |
| Character Attributes    |             | Blink, reverse, bold, shadowed (blink is 1 sec or 0.5 sec)                                                                                     |                                | Blink, reverse                                                                               |
| Graphics                |             | Line, polyline, polygon, rectangle, circle, ellipse, arc, pie, equilateral polygons (3, 4, 5, 6, 8), fill, picture                             |                                | —                                                                                            |
| Window Display          |             | 3 popup screens + 1 system screen                                                                                                              |                                | —                                                                                            |

Note 1: The backlight life refers to the time until the brightness reduces by half after use at 25°C.

Note 2: Brightness of LCD only (monochrome LCD: when lit white).

## Operation Specifications

### Touch/Pro (Display/LCD Models)

| Part No.             |  | Touch                                   | Pro               |
|----------------------|--|-----------------------------------------|-------------------|
| Switching Element    |  | Analog resistive membrane (touch panel) | Rubber switches   |
| Operating Force      |  | 0.2 to 2.5N                             | 2.0 N minimum     |
| Mechanical Life      |  | 1 million operations                    | 10,000 operations |
| Acknowledgment Sound |  | Electric Buzzer                         | Not provided      |
| Multiple Press       |  | Not possible                            | Possible          |

## Input Specifications (Touch/Pro/Lite)

| Part No.                       |                                          |                               | Touch                               |                                                                                                           | Pro/Lite FT1A-                                                                                                 |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
|--------------------------------|------------------------------------------|-------------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------|--------------------------------------|--------------------------------------|------------------|------------------|------------------|----------------|----------------|----------------|------|
|                                |                                          |                               | FT1A-*12RA-*                        | H12RC<br>B12RC                                                                                            | H12RA<br>B12RA                                                                                                 | H24RC<br>B24RC                          | H24RA<br>B24RA                       | H40RC<br>B40RC                       | H40RKA<br>B40RKA | H40RSA<br>B40RSA | H48KC<br>B48KC   | H48SC<br>B48SC | H48KA<br>B48KA | H48SA<br>B48SA |      |
| Digital Input                  | Input Points                             |                               | 6 (digital input)                   |                                                                                                           | 8                                                                                                              | 6                                       | 16                                   | 12                                   | 24               | 18               | 30               |                | 22             |                |      |
|                                | Input Type                               |                               | Sink                                |                                                                                                           | No-voltage<br>(with contact)                                                                                   | Sink                                    | Sink/<br>Source                      | Sink                                 | Sink/<br>Source  | Source           | Sink             | Sink/Source    |                | Source         | Sink |
|                                | Input Voltage Range                      |                               | 0 to 28.8V DC                       |                                                                                                           |                                                                                                                |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
|                                | Rated Input Current                      |                               | 4.4 mA                              |                                                                                                           | No-voltage type and sink/source type: 5.3 mA, sink type: 4.4 mA, source type: 5.2 mA                           |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
|                                | Input Impedance                          |                               | 5.5 kΩ                              |                                                                                                           | No-voltage type and sink/source type: 4.3 kΩ, sink type: 5.5 kΩ, source type: 4.7 kΩ                           |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
|                                | Input<br>Delay Time                      | OFF → ON                      | 2.5 μs + soft filter<br>setting     |                                                                                                           | 40 μs + filter value (high-speed input section: 2.5 μs + filter value)                                         |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
|                                |                                          | ON → OFF                      | 5 μs + soft filter<br>setting       |                                                                                                           | 150 μs + filter value (high-speed input section: 5 μs + filter value)                                          |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
|                                | Isolation                                | Between<br>input<br>terminals | Not isolated                        |                                                                                                           | Not isolated                                                                                                   |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
|                                |                                          | Internal circuit              | Not isolated                        |                                                                                                           | Contact type and sink/source type: photocoupler isolated, sink type and source type: not isolated              |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
|                                | Input Type                               |                               | Type 1 (IEC 61131-2)                |                                                                                                           |                                                                                                                |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
|                                | External Load for<br>I/O Interconnection |                               | Not needed                          |                                                                                                           |                                                                                                                |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
|                                | Operating<br>Level                       | OFF voltage                   | Less than 5 VDC                     |                                                                                                           | No-voltage type: 18 kΩ min., sink/source type and sink type: less than 5 VDC, source type: 15 VDC min.         |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
|                                |                                          | ON voltage                    | 15 VDC min.                         |                                                                                                           | No-voltage type: 2 kΩ max., sink/source type and sink type: 15 VDC min., source type: less than 5 VDC          |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
|                                |                                          | OFF current                   | Less than 0.9 mA                    |                                                                                                           | No-voltage type and sink/source type: less than 1.1 mA, sink type: less than 0.9 mA, source type: -1.0 mA min. |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
| ON current                     |                                          | 2.7 mA minimum                |                                     | No-voltage type and sink/source type: 3.0 mA min., sink type: 2.7 mA min., source type: less than -3.0 mA |                                                                                                                |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
| Analog Input                   | Input Points                             |                               | 2                                   |                                                                                                           | 2                                                                                                              | 4                                       | 6                                    | 8                                    |                  |                  |                  |                |                |                |      |
|                                | Input Type                               |                               | Voltage input                       |                                                                                                           | Voltage input                                                                                                  | Voltage input                           | Voltage input                        | Voltage input                        |                  |                  |                  |                |                |                |      |
|                                | Input Range                              |                               | 0 to 10.0 VDC                       |                                                                                                           | 0 to<br>10.0V DC                                                                                               | 0 to<br>10.0V DC                        | 0 to 10.0V DC                        | 0 to 10.0V DC                        |                  |                  |                  |                |                |                |      |
|                                | Sampling Duration Time                   |                               | 2 ms maximum                        |                                                                                                           | 2 ms<br>maximum                                                                                                | 2 ms<br>maximum                         | 2 ms maximum                         | 2 ms maximum                         |                  |                  |                  |                |                |                |      |
|                                | Total Input System<br>Transfer Time      |                               | 2 ms + sampling<br>time + scan time |                                                                                                           | 2 ms +<br>filtering time<br>+ scan time                                                                        | 2 ms +<br>filtering time<br>+ scan time | 2 ms + filtering<br>time + scan time | 2 ms + filtering<br>time + scan time |                  |                  |                  |                |                |                |      |
|                                | Resolution                               |                               | 10-bit (0 to 1000)                  |                                                                                                           | 10-bit<br>(0 to 1,000)                                                                                         | 10-bit<br>(0 to 1,000)                  | 10-bit<br>(0 to 1,000)               | 10-bit<br>(0 to 1,000)               |                  |                  |                  |                |                |                |      |
|                                | Input<br>Error                           | 25°C                          | ±3% of full scale                   |                                                                                                           | ±1.5% of<br>full scale                                                                                         | ±1.5% of<br>full scale                  | ±1.5% of full<br>scale               | ±1.5% of full<br>scale               |                  |                  |                  |                |                |                |      |
|                                |                                          | Total                         | ±5% of full scale                   |                                                                                                           | ±5% of<br>full scale                                                                                           | ±5% of<br>full scale                    | ±5% of full<br>scale                 | ±5% of full<br>scale                 |                  |                  |                  |                |                |                |      |
|                                | Isolation                                | Between<br>input<br>terminals | Not isolated                        |                                                                                                           | Not<br>isolated                                                                                                | Not<br>isolated                         | Not isolated                         | Not isolated                         |                  |                  |                  |                |                |                |      |
|                                |                                          | Internal<br>circuit           | Not isolated                        |                                                                                                           | Not<br>isolated                                                                                                | Not<br>isolated                         | Not isolated                         | Not isolated                         |                  |                  |                  |                |                |                |      |
|                                | When<br>used<br>as<br>digital<br>input   | Digital<br>I/O                |                                     | — (not conforming to IEC 61131-2 digital I/O type)                                                        |                                                                                                                |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
|                                |                                          | Opera-<br>tion Level          | OFF voltage: 5V maximum             |                                                                                                           |                                                                                                                |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
|                                |                                          |                               | ON voltage: 15V minimum             |                                                                                                           |                                                                                                                |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
|                                |                                          |                               | OFF current: 0.06mA maximum         |                                                                                                           |                                                                                                                |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
| ON current: 0.20mA minimum     |                                          |                               |                                     |                                                                                                           |                                                                                                                |                                         |                                      |                                      |                  |                  |                  |                |                |                |      |
| External<br>Power for<br>Input | Input<br>Voltage<br>Range                | —                             |                                     | —                                                                                                         | —                                                                                                              | 20.4 to<br>26.4V<br>DC                  | —                                    | 20.4 to<br>26.4V<br>DC               | —                | —                | 20.4 to 26.4V DC |                | —              | —              |      |
|                                | Output<br>Current<br>Capacity            | —                             |                                     | —                                                                                                         | —                                                                                                              | 250 mA                                  | —                                    | 300 mA                               | —                | —                | 300 mA           |                | —              | —              |      |

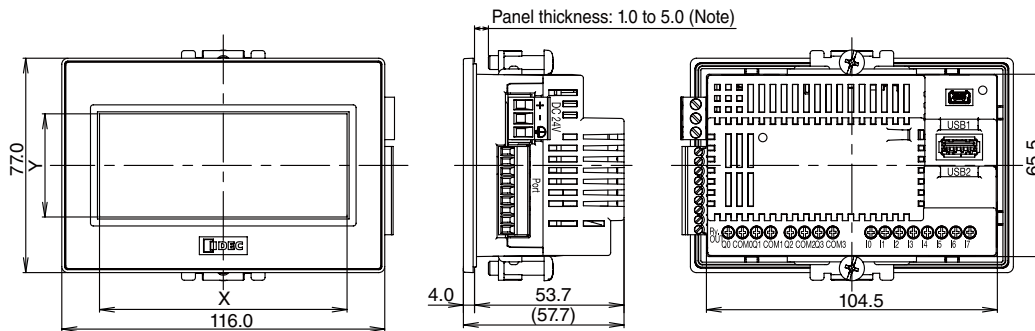
## Output Specifications (Touch/Pro/Lite)

| Part No.                   |                               |                                              |                                                                                                                                                                                                                                                                                                                                                                                | Touch                         | Pro/Lite       |                              |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |
|----------------------------|-------------------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------|------------------------------|----------------|----------------|----------------|-------------------------------------------------------------------------|------------------|----------------|----------------|----------------|----------------|---|---|--|--|
|                            |                               |                                              |                                                                                                                                                                                                                                                                                                                                                                                | FT1A-*12RA-*                  | H12RC<br>B12RC | H12RA<br>B12RA               | H24RC<br>B24RC | H24RA<br>B24RA | H40RC<br>B40RC | H40RKA<br>B40RKA                                                        | H40RSA<br>B40RSA | H48KC<br>B48KC | H48SC<br>B48SC | H48KA<br>B48KA | H48SA<br>B48SA |   |   |  |  |
| Output Specification       | Transistor Output             | Output Points                                | Transistor Sink Output                                                                                                                                                                                                                                                                                                                                                         | —                             | —              | —                            | —              | —              | —              | 4                                                                       | —                | 18             | —              | 18             | —              |   |   |  |  |
|                            |                               |                                              | Transistor Source Output                                                                                                                                                                                                                                                                                                                                                       |                               |                |                              |                |                |                | —                                                                       | 4                | —              | 18             | —              | 18             |   |   |  |  |
|                            |                               | Rated Load Voltage                           |                                                                                                                                                                                                                                                                                                                                                                                |                               |                |                              |                |                |                | 24V DC                                                                  |                  |                |                |                |                |   |   |  |  |
|                            |                               | Input Voltage Range                          |                                                                                                                                                                                                                                                                                                                                                                                |                               |                |                              |                |                |                | 20.4 to 28.8V DC                                                        |                  |                |                |                |                |   |   |  |  |
|                            |                               | Maximum Load Current                         | 1 point                                                                                                                                                                                                                                                                                                                                                                        |                               |                |                              |                |                |                | 0.3A maximum                                                            |                  |                |                |                |                |   |   |  |  |
|                            |                               | Voltage Drop (ON Voltage)                    |                                                                                                                                                                                                                                                                                                                                                                                |                               |                |                              |                |                |                | 1A maximum                                                              |                  |                |                |                |                |   |   |  |  |
|                            |                               | Inrush Current                               |                                                                                                                                                                                                                                                                                                                                                                                |                               |                |                              |                |                |                | 1V maximum (voltage between COM and output terminals when output is ON) |                  |                |                |                |                |   |   |  |  |
|                            |                               | Leakage Current                              |                                                                                                                                                                                                                                                                                                                                                                                |                               |                |                              |                |                |                | 1A                                                                      |                  |                |                |                |                |   |   |  |  |
|                            |                               | Clamping Voltage                             |                                                                                                                                                                                                                                                                                                                                                                                |                               |                |                              |                |                |                | 0.1 mA maximum                                                          |                  |                |                |                |                |   |   |  |  |
|                            |                               | Maximum Lamp Load                            |                                                                                                                                                                                                                                                                                                                                                                                |                               |                |                              |                |                |                | 39V ± 1V                                                                |                  |                |                |                |                |   |   |  |  |
|                            |                               | Inductive Load                               |                                                                                                                                                                                                                                                                                                                                                                                |                               |                |                              |                |                |                | 8 W maximum                                                             |                  |                |                |                |                |   |   |  |  |
|                            |                               | External Current Draw                        |                                                                                                                                                                                                                                                                                                                                                                                |                               |                |                              |                |                |                | L/R = 10 ms (28.8V DC, 1 Hz)                                            |                  |                |                |                |                |   |   |  |  |
|                            |                               | Isolation                                    | Between output terminal and internal circuit                                                                                                                                                                                                                                                                                                                                   |                               |                |                              |                |                |                | Photocoupler isolated                                                   |                  |                |                |                |                |   |   |  |  |
|                            |                               |                                              | Between output terminals                                                                                                                                                                                                                                                                                                                                                       |                               |                |                              |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |
|                            | Output Delay                  | OFF → ON                                     | Same common line: Not isolated<br>Separate common line: isolated<br>High-speed output terminal (100 kHz pulse output terminal): 5 μs max.<br>Normal output terminal (including 5kHz pulse output terminal): 100 μs max.<br>High-speed output terminal (100 kHz pulse output terminal): 5 μs max.<br>Normal output terminal (including 5kHz pulse output terminal): 100 μs max. |                               |                |                              |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |
|                            |                               | ON → OFF                                     |                                                                                                                                                                                                                                                                                                                                                                                |                               |                |                              |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |
|                            | 10A relay                     | Output Points                                |                                                                                                                                                                                                                                                                                                                                                                                | 4                             |                |                              |                |                |                |                                                                         |                  |                |                | —              | —              | — | — |  |  |
|                            |                               | Output Type                                  |                                                                                                                                                                                                                                                                                                                                                                                | 1a contact                    |                |                              |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |
|                            |                               | Rated Load Current                           |                                                                                                                                                                                                                                                                                                                                                                                | 240V AC 10A, 24V DC 10A       |                |                              |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |
|                            |                               | Minimum Switching Load                       |                                                                                                                                                                                                                                                                                                                                                                                | 10 mA/5V DC (reference value) |                |                              |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |
| Initial Contact Resistance |                               | 100 mΩ maximum (1A, at 6V DC)                |                                                                                                                                                                                                                                                                                                                                                                                |                               |                |                              |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |
| 2A relay                   | Output Points                 |                                              | —                                                                                                                                                                                                                                                                                                                                                                              | —                             | —              | 4                            | 4              | 12             | 8              | 8                                                                       | —                | —              | —              | —              |                |   |   |  |  |
|                            | Output Points per Common Line | COM4                                         |                                                                                                                                                                                                                                                                                                                                                                                |                               |                | 4                            | 4              | 4              | 4              | 4                                                                       |                  |                |                |                |                |   |   |  |  |
|                            |                               | COM5                                         |                                                                                                                                                                                                                                                                                                                                                                                |                               |                | —                            | —              | 4              | 4              | 4                                                                       |                  |                |                |                |                |   |   |  |  |
|                            |                               | COM6                                         |                                                                                                                                                                                                                                                                                                                                                                                |                               |                | —                            | —              | 4              | —              | —                                                                       |                  |                |                |                |                |   |   |  |  |
|                            |                               | 1a contact                                   |                                                                                                                                                                                                                                                                                                                                                                                |                               |                |                              |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |
|                            | Output Type                   |                                              |                                                                                                                                                                                                                                                                                                                                                                                |                               |                | 2A                           |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |
|                            | Maximum Load Current          | 1 point                                      |                                                                                                                                                                                                                                                                                                                                                                                |                               |                | 8A maximum                   |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |
|                            | Minimum Switching Load        |                                              |                                                                                                                                                                                                                                                                                                                                                                                |                               |                | 1 mA/5 VDC (reference value) |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |
| Initial Contact Resistance |                               | 30 mΩ maximum (1A, at 6V DC)                 |                                                                                                                                                                                                                                                                                                                                                                                |                               |                |                              |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |
| Relay Output Common        | Electrical Life               |                                              | 100,000 operations minimum (resistive load 1,800 operations/h)                                                                                                                                                                                                                                                                                                                 |                               |                |                              |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |
|                            | Mechanical Life               |                                              | 20 million operations minimum (no load 18,000 operations/h)                                                                                                                                                                                                                                                                                                                    |                               |                |                              |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |
|                            | Dielectric Strength           | Between output terminal and internal circuit | 2,300V AC, 1 minute                                                                                                                                                                                                                                                                                                                                                            |                               |                |                              |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |
|                            |                               | Between output terminals (between COMs)      | 2,300V AC, 1 minute                                                                                                                                                                                                                                                                                                                                                            |                               |                |                              |                |                |                |                                                                         |                  |                |                |                |                |   |   |  |  |

## Dimensions

### Touch (Display Model)

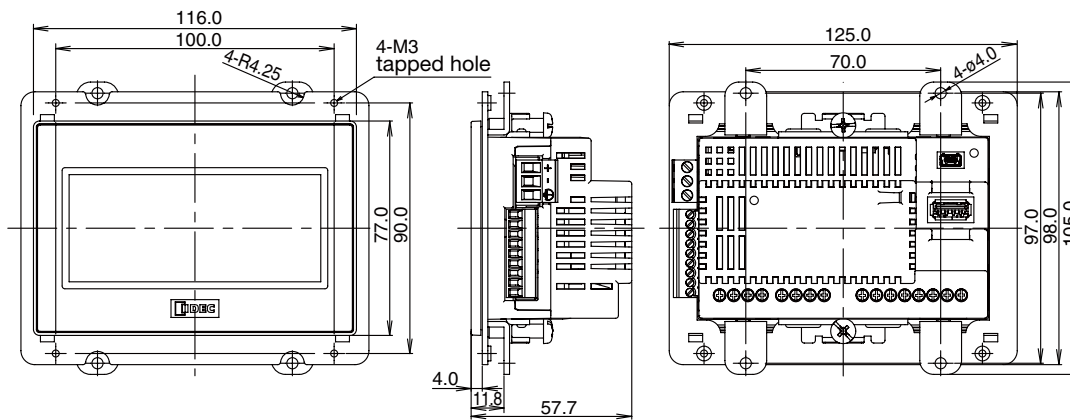
When using mounting bracket (HG9Z-4K2PN04)



### LCD Active Area

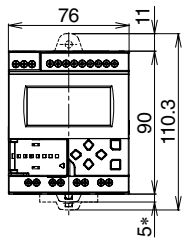
| LCD Type | X     | Y     |
|----------|-------|-------|
| TFT      | 88.92 | 37.05 |
| STN      | 87.59 | 35.49 |

When using rear mount adapter (FT9Z-1A01)

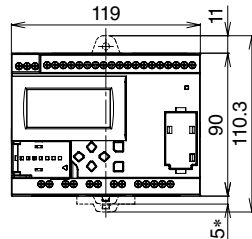


### Pro (LCD Model)

FT1A-H12\*A/\*C

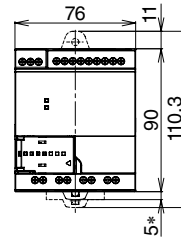


FT1A-H24\*A/\*C

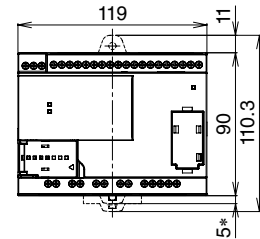


### Lite (No LCD Model)

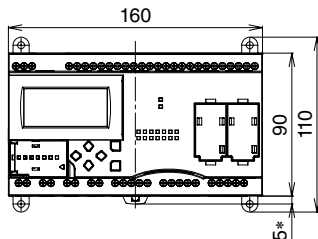
FT1A-B12\*A/\*C



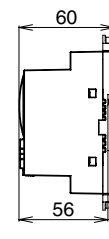
FT1A-B24\*A/\*C



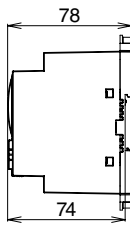
FT1A-H40\*A/\*C



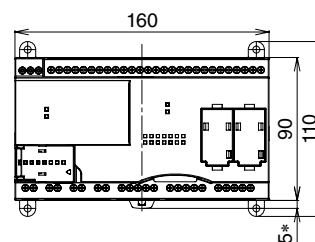
FT1A-H\*\*A



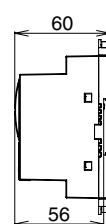
FT1A-H\*\*C



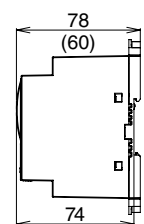
FT1A-B40\*A/\*C



FT1A-B\*\*A

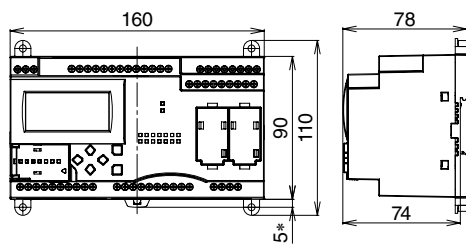


FT1A-B\*\*C



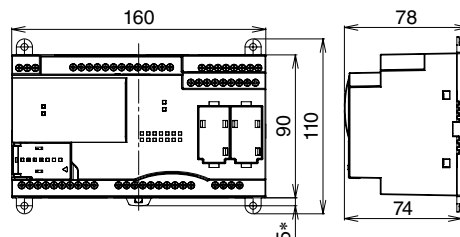
All dimensions in mm.

## FT1A-H48\*A/\*C



Note: 9.3 mm when the clamp is pulled out.

## FT1A-B48\*A/\*C

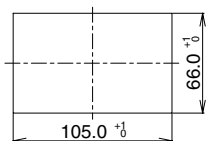


Note: 9.3 mm when the clamp is pulled out.

## Mounting Hole Layout

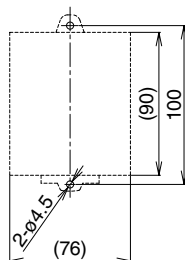
### Touch

FT1A-\*12RA-\*

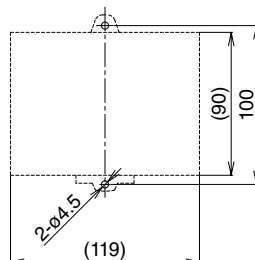


### Pro/Lite

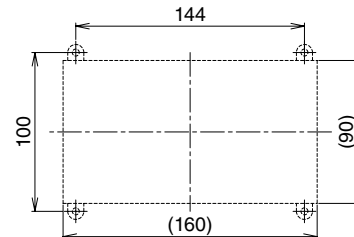
FT1A-\*12\*\*



FT1A-\*24\*\*



FT1A-\*40\*\*/FT1A-\*48\*\*

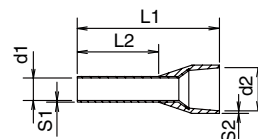


All dimensions in mm.

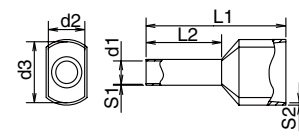
## Recommended Ferrules for Touch/Pro/Lite

| Cross Section (mm <sup>2</sup> ) | Cable Size | Phoenix Contact Part No. (Order No.) |                                    |
|----------------------------------|------------|--------------------------------------|------------------------------------|
|                                  |            | For 1-wire connection                | For 2-wire connection              |
| 0.25                             | AWG24      | AI 0.25-8 YE (32 00 04 3)            | —                                  |
| 0.5                              | AWG22      | AI 0.5-8 WH (32 00 01 4)             | AI-TWIN 2 × 0.5-8 WH (32 00 93 3)  |
| 0.75                             | AWG18      | —                                    | AI-TWIN 2 × 0.75-8 GY (32 00 80 7) |
| 1.0                              | 18         | AI 1-8 RD (32 00 03 0)               | —                                  |
| 1.5                              | 16         | AI 1.5-8 BK (32 00 04 3)             | —                                  |

### For 1-wire connection



### For 2-wire connection



### For 1-wire connection

Package Quantity: 1

| Cross Section (mm <sup>2</sup> ) | Phoenix Contact Part No. (Order No.) | L1   | L2  | d1  | S1   | d2  | S2   |
|----------------------------------|--------------------------------------|------|-----|-----|------|-----|------|
| 0.25                             | AI 0.25-8 YE (32 00 04 3)            | 12.5 | 8.0 | 0.8 | 0.15 | 1.8 | 0.25 |
| 0.5                              | AI 0.5-8 WH (32 00 01 4)             | 14.0 | 8.0 | 1.1 | 0.15 | 2.5 | 0.3  |
| 1.0                              | AI 1-8 RD (32 00 03 0)               | 14.5 | 8.0 | 1.5 | 0.15 | 3.0 | 0.3  |
| 1.5                              | AI 1.5-8 BK (32 00 04 3)             | 14.5 | 8.0 | 1.8 | 0.15 | 3.4 | 0.3  |

### For 2-wire connection

Package Quantity: 1

| Cross Section (mm <sup>2</sup> ) | Phoenix Contact Part No. (Order No.) | L1   | L2  | d1  | S1   | d2  | d3  | S2   |
|----------------------------------|--------------------------------------|------|-----|-----|------|-----|-----|------|
| 2 × 0.5                          | AI-TWIN 2 × 0.5-8 WH (32 00 93 3)    | 15.0 | 8.0 | 1.5 | 0.15 | 2.5 | 4.6 | 0.25 |
| 2 × 0.75                         | AI-TWIN 2 × 0.75-8 GY (32 00 80 7)   | 15.0 | 8.0 | 1.8 | 0.15 | 2.7 | 5.2 | 0.3  |

## Instructions

### Basic Instructions (Touch/Pro/Lite)

| Instructions | Function                                                                 |
|--------------|--------------------------------------------------------------------------|
| LOD          | Stores intermediate results and reads contact status                     |
| LODN         | Stores intermediate results and reads inverted contact status            |
| AND          | Series connection of NO contact                                          |
| ANDN         | Series connection of NC contact                                          |
| OR           | Parallel connection of NO contact                                        |
| ORN          | Parallel connection of NC contact                                        |
| ANDL0D       | Series connection of circuit blocks                                      |
| ORL0D        | Parallel connection of circuit blocks                                    |
| BPS          | Saves the result of bit logical operation temporarily                    |
| BRD          | Reads the result of bit logical operation which was saved temporarily    |
| BPP          | Restores the result of bit logical operation which was saved temporarily |
| OUT          | Outputs the result of bit logical operation                              |
| OUTN         | Output the inverted result of bit logical operation                      |
| SET          | Sets output, internal relay, or shift register bit                       |
| RST          | Resets output, internal relay, or shift register bit                     |
| TMS          | Subtracting 1-ms on-delay timer (0 to 65.535 sec)                        |
| TMH          | Subtracting 10-ms on-delay timer (0 to 655.35 sec)                       |
| TIM          | Subtracting 100-ms on-delay timer (0 to 6553.5 sec)                      |
| TML          | Subtracting 1-sec on-delay timer (0 to 65535 sec)                        |
| TMSO         | Subtracting 1-ms off-delay timer (0 to 65.535 sec)                       |
| TMHO         | Subtracting 10-ms off-delay timer (0 to 655.35 sec)                      |

| Instructions | Function                                                              |
|--------------|-----------------------------------------------------------------------|
| TIMO         | Subtracting 100-ms off-delay timer (0 to 6553.5 sec)                  |
| TMLO         | Subtracting 1-sec off-delay timer (0 to 65535 sec)                    |
| CNT          | Adding counter (0 to 65,535)                                          |
| CNTD         | Double-word adding counter (0 to 4,294,967,295)                       |
| CDP          | Dual pulse reversible counter (0 to 65,535)                           |
| CDPD         | Double-word dual pulse reversible counter (0 to 4,294,967,295)        |
| CUD          | Up/down selection reversible counter (0 to 65,535)                    |
| CUDD         | Double-word up/down selection reversible counter (0 to 4,294,967,295) |
| CC=          | Equal to comparison of counter current value                          |
| CC≥          | Greater than or equal to comparison of counter current value          |
| DC=          | Equal to comparison of data register value                            |
| DC≥          | Greater than or equal to comparison of data register value            |
| SFR          | Forward shift register                                                |
| SFRN         | Reverse shift register                                                |
| SOTU         | Rising-edge differentiation output                                    |
| SOTD         | Falling-edge differentiation output                                   |
| JMP          | Jumps a designated program area                                       |
| JEND         | Ends a jump instruction                                               |
| MCS          | Starts a master control                                               |
| MCR          | Ends a master control                                                 |
| END          | Ends a program                                                        |

## Advanced Instructions (Touch/Pro/Lite)

| Instructions | Name                                      |
|--------------|-------------------------------------------|
| NOP          | No Operation                              |
| MOV          | Move                                      |
| MOVN         | Move Not                                  |
| IMOV         | Indirect Move                             |
| IMOVN        | Indirect Move Not                         |
| IBMV         | Indirect Bit Move                         |
| IBMVN        | Indirect Bit Move Not                     |
| BMOV         | Block Move                                |
| NSET         | N Data Set                                |
| NRS          | N Data Repeat Set                         |
| XCHG         | Exchange                                  |
| TCCST        | Timer/Counter Current Value Store         |
| CMP=         | Compare Equal To                          |
| CMP<>        | Compare Unequal To                        |
| CMP<         | Compare Less Than                         |
| CMP>         | Compare Greater Than                      |
| CMP<=        | Compare Less Than or Equal To             |
| CMP>=        | Compare Greater Than or Equal To          |
| ICMP>=       | Interval Compare Greater Than or Equal to |
| LC=          | Load Compare Equal To                     |
| LC<>         | Load Compare Unequal To                   |
| LC<          | Load Compare Less Than                    |
| LC>          | Load Compare Greater Than                 |

| Instructions | Name                                  |
|--------------|---------------------------------------|
| LC<=         | Load Compare Less Than or Equal To    |
| LC>=         | Load Compare Greater Than or Equal To |
| ADD          | Addition                              |
| SUB          | Subtraction                           |
| MUL          | Multiplication                        |
| DIV          | Division                              |
| INC          | Increment                             |
| DEC          | Decrement                             |
| ROOT         | Root                                  |
| SUM          | Sum                                   |
| RAD          | Degree to Radian                      |
| DEG          | Radian to Degree                      |
| SIN          | Sine                                  |
| COS          | Cosine                                |
| TAN          | Tangent                               |
| ASIN         | Arc Sine                              |
| ACOS         | Arc Cosine                            |
| ATAN         | Arc Tangent                           |
| LOGE         | Natural Logarithm                     |
| LOG10        | Common Logarithm                      |
| EXP          | Exponent                              |
| POW          | Power                                 |
| ANDW         | AND Word                              |

| Instructions | Name              |
|--------------|-------------------|
| ORW          | OR Word           |
| XORW         | Exclusive OR Word |
| SFTL         | Shift Left        |
| SFTR         | Shift Right       |
| BCDLS        | BCD Left Shift    |
| WSFT         | Word Shift        |
| ROTL         | Rotate Left       |
| ROTR         | Rotate Right      |
| HTOB         | Hex to BCD        |
| BTOH         | BCD to Hex        |
| HTOA         | Hex to ASCII      |
| ATOH         | ASCII to Hex      |
| BTOA         | BCD to ASCII      |
| ATOB         | ASCII to BCD      |
| ENCO         | Encode            |
| DECO         | Decode            |
| BCNT         | Bit Count         |
| ALT          | Alternate Output  |
| CVDT         | Convert Data Type |
| DTDV         | Data Divide       |
| DTCB         | Data Combine      |
| SWAP         | Data Swap         |

## Advanced Instructions (Continued)

| Instructions | Function                   | Touch            | Pro/Lite        |                 |                 |                 |  |
|--------------|----------------------------|------------------|-----------------|-----------------|-----------------|-----------------|--|
|              |                            | FT1A-<br>*12RA-* | FT1A-<br>*12*** | FT1A-<br>*24*** | FT1A-<br>*40*** | FT1A-<br>*48*** |  |
| TXDn         | Transmit                   | —                | —               | ×               | ×               | ×               |  |
| RXDn         | Receive                    | —                | —               | ×               | ×               | ×               |  |
| ETXDn        | Transmit over Ethernet     | —                | —               | ×               | ×               | ×               |  |
| ERXDn        | Receive over Ethernet      | —                | —               | ×               | ×               | ×               |  |
| LABEL        | Label                      | ×                | ×               | ×               | ×               | ×               |  |
| LJMP         | Label Jump                 | ×                | ×               | ×               | ×               | ×               |  |
| LCAL         | Label Call                 | ×                | ×               | ×               | ×               | ×               |  |
| LRET         | Label Return               | ×                | ×               | ×               | ×               | ×               |  |
| DJNZ         | Decrement Jump Non-zero    | ×                | ×               | ×               | ×               | ×               |  |
| MSG          | Message                    | —                | ×               | ×               | ×               | ×               |  |
|              |                            |                  | (Pro only)      | (Pro only)      | (Pro only)      | (Pro only)      |  |
| IOREF        | I/O Refresh                | ×                | ×               | ×               | ×               | ×               |  |
| HSCRF        | High-speed Counter Refresh | ×                | ×               | ×               | ×               | ×               |  |
| WEEK         | Week Timer                 | ×                | ×               | ×               | ×               | ×               |  |
| YEAR         | Yearly Timer               | ×                | ×               | ×               | ×               | ×               |  |
| TADD         | Time Addition              | ×                | ×               | ×               | ×               | ×               |  |
| TSUB         | Time Subtraction           | ×                | ×               | ×               | ×               | ×               |  |
| HOURL        | Hour Meter                 | ×                | ×               | ×               | ×               | ×               |  |
| HTOS         | HMS to Sec                 | ×                | ×               | ×               | ×               | ×               |  |
| STOH         | Sec to HMS                 | ×                | ×               | ×               | ×               | ×               |  |
| DTML         | 1-sec Dual Timer           | ×                | ×               | ×               | ×               | ×               |  |
| DTIM         | 100-ms Dual Timer          | ×                | ×               | ×               | ×               | ×               |  |
| DTMH         | 10-ms Dual Timer           | ×                | ×               | ×               | ×               | ×               |  |
| DTMS         | 1-ms Dual Timer            | ×                | ×               | ×               | ×               | ×               |  |
| TTIM         | Teaching Timer             | ×                | ×               | ×               | ×               | ×               |  |
| PULSn        | Pulse Output               | —                | —               |                 | ×               | ×               |  |
| PWMn         | Pulse Width Modulation     | —                | —               |                 | ×               | ×               |  |
| RAMPn        | Ramp Pulse Output          | —                | —               |                 | ×               | ×               |  |
| ZRNn         | Zero Return                | —                | —               |                 | ×               | ×               |  |
| ARAMPn       | Advanced Ramp              | —                | —               |                 | ×               | ×               |  |
| DI           | Disable Interrupt          | ×                | ×               | ×               | ×               | ×               |  |
| EI           | Enable Interrupt           | ×                | ×               | ×               | ×               | ×               |  |
| XYFS         | XY Format Set              | ×                | ×               | ×               | ×               | ×               |  |
| CVXTY        | Convert X to Y             | ×                | ×               | ×               | ×               | ×               |  |
| CVYTX        | Convert Y to X             | ×                | ×               | ×               | ×               | ×               |  |
| AVRG         | Average                    | ×                | ×               | ×               | ×               | ×               |  |
| FIFO         | FIFO Format                | ×                | ×               | ×               | ×               | ×               |  |
| FIEX         | First-In Execute           | ×                | ×               | ×               | ×               | ×               |  |
| FOEX         | First-Out Execute          | ×                | ×               | ×               | ×               | ×               |  |
| NDSRC        | N Data Search              | ×                | ×               | ×               | ×               | ×               |  |
| SCRPT (Note) | Script                     | ×                | ×               | ×               | ×               | ×               |  |
| DLOG         | Data Logging               | —                | —               |                 | ×               | ×               |  |
| TRACE        | Data Trace                 | —                | —               |                 | ×               | ×               |  |

×: Available, —: Not available

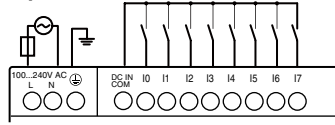
\* DC power type only

Note: Available soon

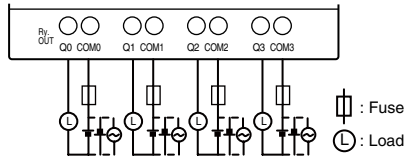
## Terminal Arrangement and I/O Wiring Diagram Examples

### FT1A-\*12RC

#### Input Side

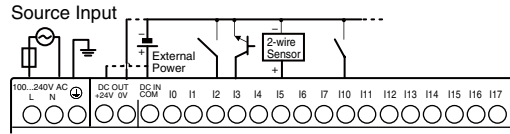


#### Output Side

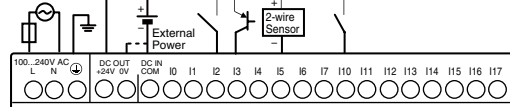


### FT1A-\*24RC

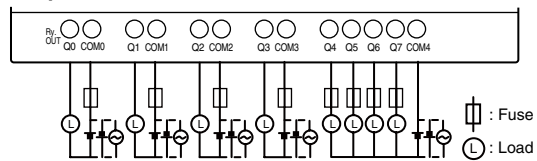
#### Input Side (sink/source)



#### Sink Input



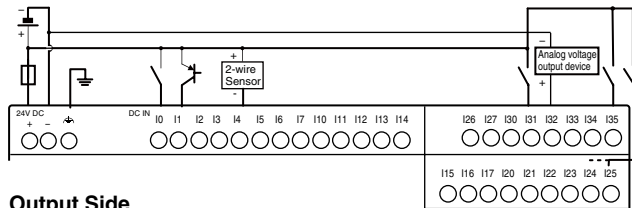
#### Output Side



### FT1A-\*48SA

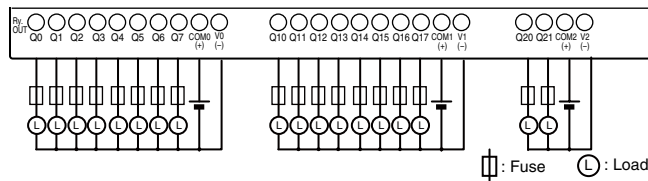
#### Input Side

##### Sink Input



#### Output Side

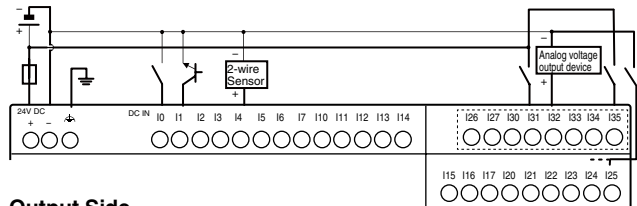
##### Source Output



### FT1A-\*48KA

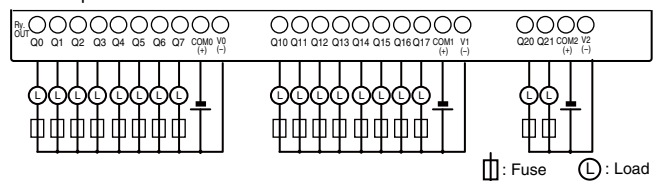
#### Input Side

##### Source Input (Analog/Digital Shared Input) is Sink Input)



#### Output Side

##### Sink Output



For terminal arrangement and I/O wiring diagram, see User's Manual.

Specifications and other descriptions in this catalog are subject to change without notice.



## IDEC CORPORATION

**IDEC CORPORATION (USA)**  
1175 Elko Drive  
Sunnyvale, CA 94089-2209, USA  
Tel: +1-408-747-0550 / (800) 262-IDEC (4332)  
Fax: +1-408-744-9055 / (800) 635-6246  
E-mail: opencontact@idec.com

**IDEC CANADA LIMITED**  
3155 Pepper Mill Court, Unit 4  
Mississauga, Ontario, L5L 4X7, Canada  
Tel: +1-905-890-8561  
Toll Free: (800) 262-IDEC (4332)  
Fax: +1-905-890-8562  
E-mail: sales@ca.idec.com

**IDEC AUSTRALIA PTY. LTD.**  
Unit 17, 104 Ferntree Gully Road,  
Oakleigh, Victoria 3166, Australia  
Tel: +61-3-8523-5900, Toll Free: 1800-68-4332  
Fax: +61-3-8523-5999  
E-mail: sales@au.idec.com

**IDEC ELECTRONICS LIMITED**  
Unit 2, Beechwood, Chineham Business Park,  
Basingstoke, Hampshire RG24 8WA, UK  
Tel: +44-1256-321000, Fax: +44-1256-327755  
E-mail: sales@uk.idec.com

**IDEC ELEKTROTECHNIK GmbH**  
Wendenstrasse 331, 20537 Hamburg, Germany  
Tel: +49-40-25 30 54 - 0, Fax: +49-40-25 30 54 - 24  
E-mail: service@idec.de

**IDEC (SHANGHAI) CORPORATION**  
Room 701-702 Chong Hing Finance Center,  
No. 288 Nanjing Road West, Shanghai 200003, PRC  
Tel: +86-21-6135-1515  
Fax: +86-21-6135-6225 / +86-21-6135-6226  
E-mail: idec@cn.idec.com

**IDEC (BEIJING) CORPORATION**  
Room 211B, Tower B, The Grand Pacific Building,  
8A Guanghua Road, Chaoyang District,  
Beijing 100026, PRC  
Tel: +86-10-6581-6131, Fax: +86-10-6581-5119

6-64, Nishi-Miyahara 2-Chome, Yodogawa-ku, Osaka 532-0004, Japan  
Tel: +81-6-6398-2571, Fax: +81-6-6392-9731  
E-mail: marketing@idec.co.jp

**IDEC (SHENZHEN) CORPORATION**  
Unit AB-3B2, Tian Xiang Building, Tian'an Cyber Park,  
Fu Tian District, Shenzhen, Guang Dong 518040, PRC  
Tel: +86-755-8356-2977, Fax: +86-755-8356-2944

**IDEC IZUMI (H.K.) CO., LTD.**  
Units 11-15, Level 27, Tower 1,  
Millennium City 1, 388 Kwun Tong Road,  
Kwun Tong, Kowloon, Hong Kong  
Tel: +852-2803-8989, Fax: +852-2565-0171  
E-mail: info@hk.idec.com

**IDEC TAIWAN CORPORATION**  
8F-1, No. 79, Hsin Tai Wu Road, Sec. 1,  
Hsi-Chih District, 22101 New Taipei City, Taiwan  
Tel: +886-2-2698-3929, Fax: +886-2-2698-3931  
E-mail: service@tw.idec.com

**IDEC IZUMI ASIA PTE. LTD.**  
No. 31, Tannery Lane #05-01,  
HB Centre 2, Singapore 347788  
Tel: +65-6746-1155, Fax: +65-6844-5995  
E-mail: info@sg.idec.com