



*Think Automation and beyond...*



**IDEC FT1A SmartAXIS**

*Value. Versatility. The New Breed of Controllers.*

## Design-in More Function with Affordable FT1A PLCs



12 I/O



24 I/O



40 I/O





## Value. Versatility. The New Breed of Controller!

The ideal solution for a variety of applications.

Presenting FT1A, the newest family of controllers from the industry's original manufacturer of micro PLCs. FT1A controllers deliver affordability without compromise, because all of the features and functions are already built in. Design engineers can now enjoy more versatility and more choices for their automation needs than ever before!

The SmartAXIS family is designed to give you the most bang for your buck. These simple, powerful controllers deliver an exceptional value. FT1A controllers are available with 12, 24, 40, or 48 I/O, while a 3.8" HMI + PLC is also available with sophisticated features and a super-bright LCD screen. Whatever your application requires, the FT1A SmartAXIS family has a solution!



48 I/O



3.8" HMI + PLC



# The Value of Our Controllers is in the Details

## FT1A Controllers

FT1A controllers are designed for a range of applications that demand powerful and abundant features. Available with 12, 24, 40 and 48 I/O with and without embedded LCD/keypad, these controllers enable engineers to design cost-effective solutions.

### Smart LCD Screen

The display (24 digits x 4 lines) can provide visual feedback of system status, I/O status, user configurable messages with dynamic data, bar graph, and ladder program monitor and controls.

### Non-LCD Model

FT1A controllers are also available without embedded LCD/keypad. It's a cost-effective, tamper-proof solution.

### USB mini-B

With the USB mini-B port, communication with FT1A controllers is extremely convenient as standard USB Type A to mini-B cables can be used.

Note: Features available on specific models.  
See page 14 for selection guide.

### Universal Voltages

24V DC or 100-240V AC



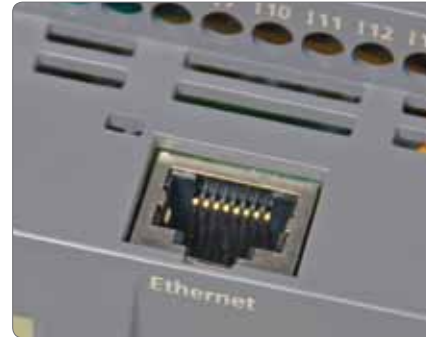
Actual Size

### Memory Cartridge

The optional memory cartridge can be used to easily transfer programs from the internal ROM memory of FT1A controllers to a memory cartridge or vice versa. It's a convenient method to update the PLC program in the field.

### Digital, Analog and High-speed Inputs

Inputs on the 24V DC power models can be configured as digital, 0-10V DC analog or high-speed counters. Up to 8 analog inputs with 10-bit resolution and up to 6 HSC 100kHz can be configured.



### RJ45 Ethernet Port

The embedded Ethernet port on the FT1A controllers provides users with easy access for remote maintenance and communication. It also supports industry standard Modbus TCP protocol. With Ethernet Remote I/O capability, the FT1A controller's I/O can be easily expanded.

### Real-Time Clock

Every FT1A controller is equipped with an embedded real-time clock for time-controlled applications. With the built-in, real-time clock, log data can also be tracked and, with just a click, daylight savings time can easily be setup.

### RS232C and RS485 Ports

Up to two RS232C and/or RS485 communication cartridges can be plugged into the FT1A controllers to allow the PLC to communicate with other serial devices. It also supports industry standard Modbus RTU protocol.

### Large Programming Memory

With up to 48KB (11,850 steps) of programming memory, FT1A controllers have enough memory for even complex PLC programming.

### SD Memory

With the embedded SD memory slot, critical data can be easily logged and retrieved over Ethernet connections or simply remove the SD card and plug it into your PC.

### 10A Relay and High-speed Outputs

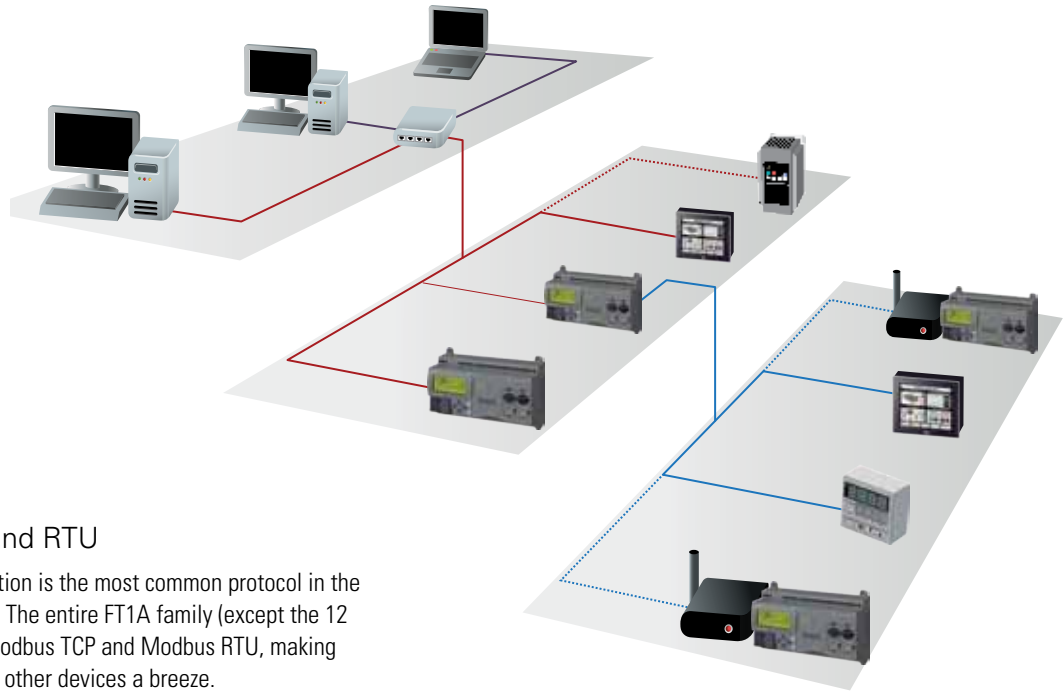
The FT1A controller with relay outputs is equipped with four 10A relay contacts. The transistor outputs model is also equipped with two 100kHz high-speed outputs for simple positioning controls. With remote I/O capability, additional outputs can easily be added.



# A Closer Look at Our Feature-rich Controllers

## From Connecting to Remote Access

From connectivity to remote access to visual display, FT1A leads the way with versatile, full-featured controllers. No other controllers offer such a broad range of capabilities at such a competitive price.



### Modbus TCP and RTU

Modbus communication is the most common protocol in the automation industry. The entire FT1A family (except the 12 I/O CPU) supports Modbus TCP and Modbus RTU, making communication with other devices a breeze.

### Ethernet Connectivity

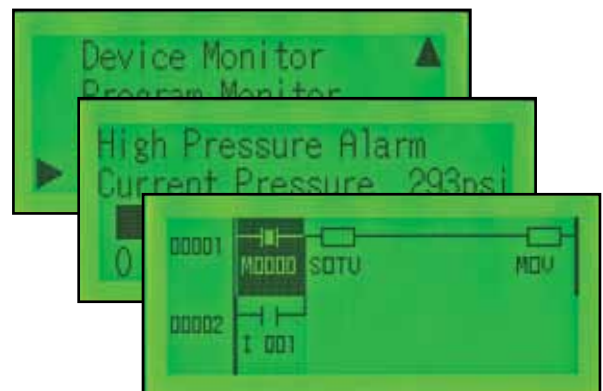
Thanks to the embedded RJ45 Ethernet port (on all models except 12 I/O), FT1A controllers can be easily accessed from remote locations. Using WindLDR software, PLC programs can be updated remotely and critical parameters monitored and controlled. Remote connectivity is a critical part of today's control environment, and FT1A controllers meet every challenge with fast, easy, and reliable Ethernet connectivity.

### Smart LCD Display

With the embedded LCD screen, I/O status, system menus, customized dynamic messages, and bar-graph readouts can all be configured and displayed. Ladder programs can be displayed and controlled as well. You can configure up to 50 customized messages, all with dynamic values (24 digits by 4 lines max.). The backlight can be turned on or off. Scrolling and flashing are also supported.

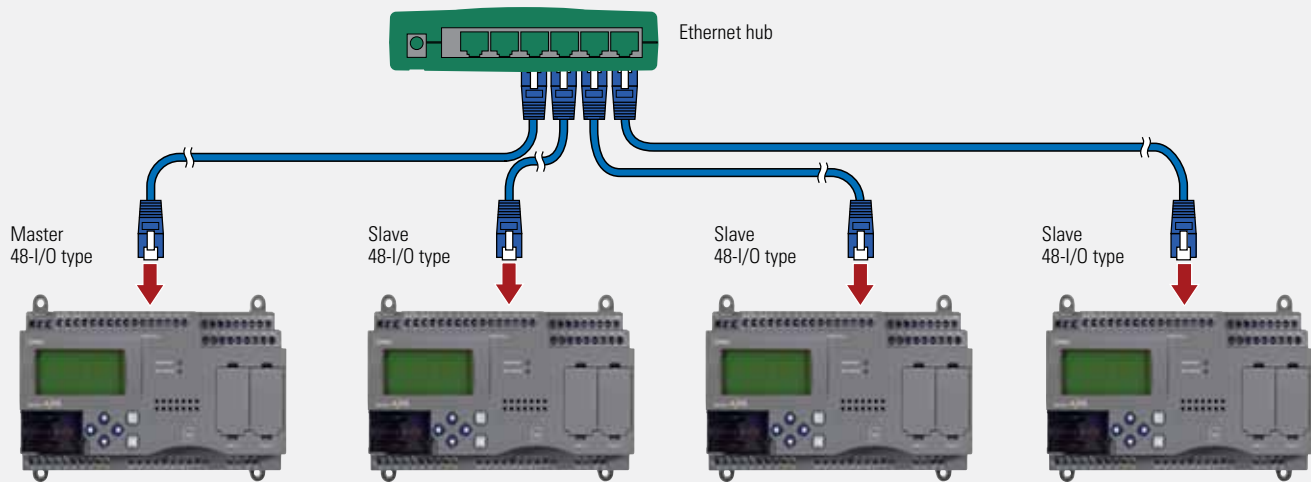
### SD Memory Card

FT1A 40 and 48 I/O controllers are equipped with an SD memory slot for data logging. Memory cards up to 32GB are supported. Log data is time/date stamped and stored in .CSV format, making it simple to review and analyze critical system data.



## Remote I/O

The FT1A remote I/O, available in all Ethernet-capable modules, enables you to expand the number of inputs and outputs by simply connecting separate FT1A modules via Ethernet as remote I/O slaves. The FT1A remote I/O can monitor and control a total of 192 points of I/O.



48-I/O type (master) + 48-I/O type (slave) + 48-I/O type (slave) + 48-I/O type (slave) = 192 I/O  
 (30 inputs, 18 outputs) + (30 inputs, 18 outputs) + (30 inputs, 18 outputs) + (30 inputs, 18 outputs) = 120 inputs, 72 outputs

## Built-in Analog Inputs

The FT1A controllers support up to 8 built-in, 0-10V DC analog inputs with 10-bit resolution, depending on the model. Having the option to configure the analog inputs on the CPU saves you time, space and money.

## 100kHz, High-Speed Counters and Outputs

Models with transistor outputs feature two 100kHz high-speed outputs for positioning control and all FT1A controllers are equipped with up to six 100kHz high-speed counters.

## 10 Amp Relay Contacts

FT1A controllers with relay outputs offer 10 Amp rated contacts. Traditional PLC relays are only rated for 2 Amps. Therefore, FT1A controllers reduce the need for, and spare you the cost of, using interposing relays.

## Built-in Real Time Clock

Equipped with a real-time clock for use with any time-controlled applications, FT1A controllers have built-in support for US, Canadian, European, and Australian daylight savings time. The option for the user to configure their own custom daylight savings schedule is also available, providing the utmost in flexibility.

## USB Maintenance Port

A convenient USB mini-B maintenance port is standard on all FT1A controllers, which means any standard Type A to mini-B USB cable can be used. No special cable is necessary.

# FT1A Touch HMI + PLC

## A Breed of Its Own

The perfect combination of PLC processing and HMI monitoring and control, the 3.8-inch SmartAXIS Touch is an all-in-one touchscreen interface and logic controller packed in a compact body big on features. Perfect for small systems that require a graphical user interface along with versatile I/O controls at a truly affordable price.

### RS232 and RS485 ports

Built-in RS232C, RS422/485 interface for serial communication.

### USB-A Port

Embedded USB-A port for storing project and recipe data, as well as for performing program updates.

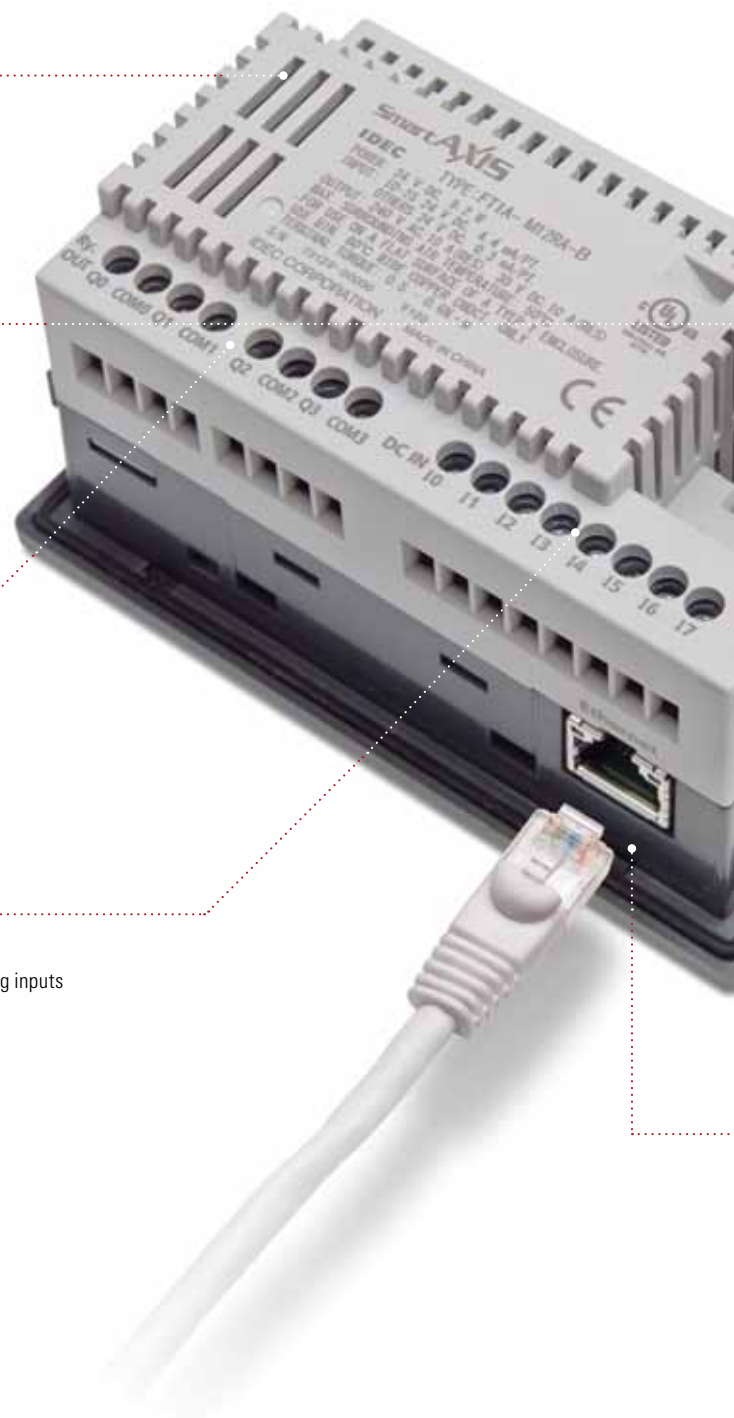
### 10A Relay Contacts

4 built-in 10A relay contacts. Interposing relays are not required.

### Digital, Analog and High-speed Inputs

8 built-in DC inputs

- 2 inputs (I6 and I7) can be configured as 0-10V DC analog inputs
  - 10-bit resolution
- 4 high-speed counters
  - Up to 10kHz



#### USB Mini-B

Embedded USB mini-B port for programming.

#### 3 Bezel Colors

Available in silver, light gray and dark gray bezel.

#### STN Monochrome or 65KTFT Color

- 400cd/m<sup>2</sup> color
- 740cd/m<sup>2</sup> monochrome



Actual Size



#### IP66F Protection

Front panel (water tight and oil tight)

#### 5MB Programming Memory

Provides users with more flexibility and stress-free programming.

#### RJ45 Ethernet Port

Supports remote Ethernet communication and Modbus TCP.

# FT1A Touch Features

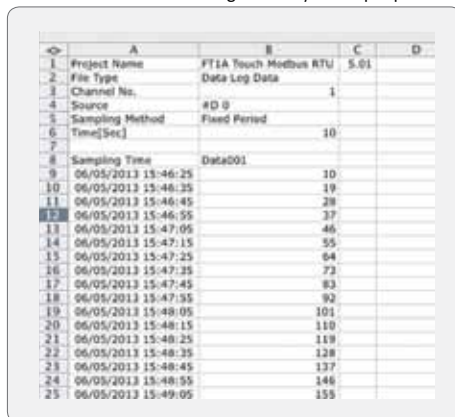
## Control Functions

### Fast Processing Speed

The processing speed of FT1A Touch is not compromised as basic instructions can be processed in 1850µs per 1000 steps of programming.

### Data Logging

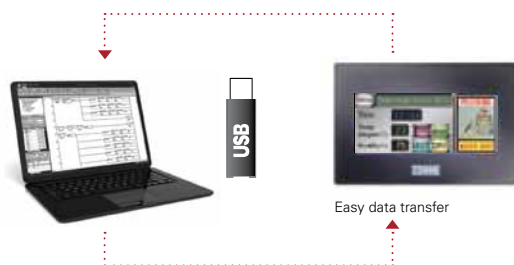
Critical data can be saved and logged into a USB memory stick. Logged data can easily be retrieved over an Ethernet connection or by removing the USB memory stick from the FT1A Touch and inserting it into your laptop or PC.



	A	B	C	D
1	Project Name	FT1A Touch Modbus RTU	5.01	
2	File Type	Data Log Data		
3	Channel No.		1	
4	Source	#D 9		
5	Sampling Method	Fixed Period		
6	Time[Sec]		10	
7				
8	Sampling Time	Data001		
9	06/05/2013 15:46:25		10	
10	06/05/2013 15:46:35		19	
11	06/05/2013 15:46:45		28	
12	06/05/2013 15:46:55		37	
13	06/05/2013 15:47:05		46	
14	06/05/2013 15:47:15		55	
15	06/05/2013 15:47:25		64	
16	06/05/2013 15:47:35		73	
17	06/05/2013 15:47:45		83	
18	06/05/2013 15:47:55		92	
19	06/05/2013 15:48:05		101	
20	06/05/2013 15:48:15		110	
21	06/05/2013 15:48:25		119	
22	06/05/2013 15:48:35		128	
23	06/05/2013 15:48:45		137	
24	06/05/2013 15:48:55		146	
25	06/05/2013 15:49:05		155	

### Easy Program File Transfer

Project files can be easily transferred between a USB memory stick and the FT1A Touch. It is a quick and convenient way for an OEM to program multiple units and for users to quickly update ladder and HMI programs.



### Digital and Analog Inputs

The FT1A Touch is equipped with 8 digital inputs, two of which can be configured as 0-10V DC analog inputs with 10-bit resolution. The built-in analog inputs can reduce overall system cost.

### High-speed Counters

With 8 built-in inputs, 4 can be configured as high-speed counters, with a maximum frequency (range) of 10kHz for single-phase or 5kHz for dual-phase.



### Large Programming Memory

FT1A Touch is equipped with abundant memory capacity. With 48KB of logic controls programming, complex PLC programs can be constructed without much restriction. And with 5MB of configuration memory for the display, a unique and professional display interface can be easily configured.

### 10A Relay Outputs

With 10A contact ratings on all four of the relay outputs, the FT1A Touch can be directly connected to a solenoid valve or motor, which eliminates interposing relays and reduces wiring.





### 65,536 TFT Color LCD

With that many color combinations, an intuitive and crisp graphical user interface can be constructed with unparalleled visibility.

### Super-Bright LED

FT1A Touch is one of the brightest compact displays. The 65K TFT color unit is rated at 400cd/m<sup>2</sup> and the monochrome unit is rated at 740cd/m<sup>2</sup>. With 32 levels of brightness control, the backlight can be adjusted according to the surrounding conditions.

## Display Functions

### Ethernet Connectivity

With the embedded RJ45 Ethernet port, FT1A project files can be remotely uploaded or downloaded over Ethernet connection. Critical logging data can also be retrieved quickly.

### Modbus TCP or RTU

The built-in Ethernet ports allow the FT1A Touch to be configured as a Client (Master) or Server (Slave) on the Modbus network. Modbus RTU (Master) is also supported. With these capabilities, FT1A Touch can communicate with other PLCs or devices using Modbus protocol.

### Ladder Program and I/O status

PLC ladder programs can easily be monitored and controlled on the 3.8" (3.7" monochrome) display. It is a unique tool to debug the system without using WindLDR software and a PC. I/O status and any PLC parameter such as data register, timer, and internal relay can also be monitored and controlled.



### Fast Start-up

Once power is applied to the FT1A Touch, it takes only 3 seconds for it to be fully functional. The fast start-up allows for fast, easy debugging and stress-free operation.



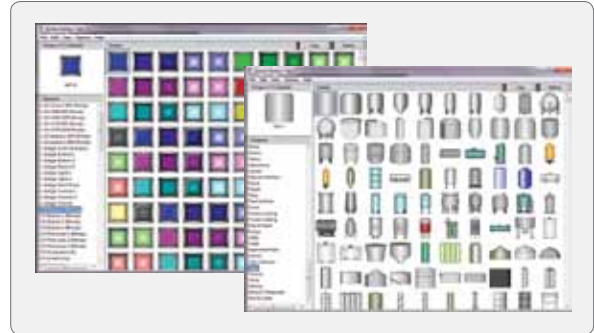
# Our Automation Organizer Software is Simple and Intuitive

## A Complete Automation Suite: All-in-one Configuration Software

Automation Organizer (AO) is a powerful software suite containing WindLDR PLC programming software, WindO/I-NV2 OI touchscreen configuration software, WindO/I-NV3 FT1A Touch configuration software, and WindCFG system configuration software. AO is an all-in-one automation software package for IEC PLCs and IEC OI touchscreens. The news gets even better, because AO software upgrades are always FREE.

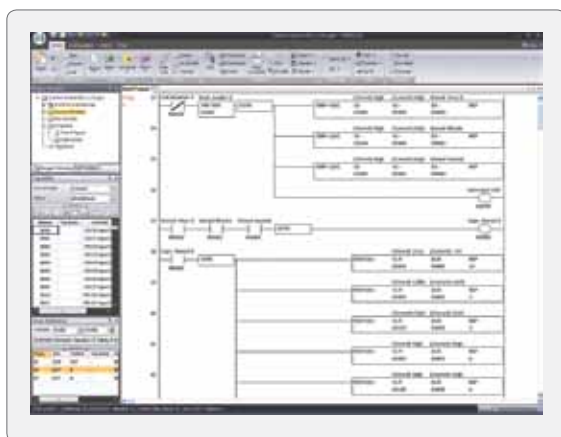
### WindO/I-NV3

WindO/I-NV3 is our exclusive configuration software for the FT1A Touch. Using the same platform as WindO/I-NV2 HG Touchscreen programming software, WindO/I-NV3 provides users with the same intuitive experience. Users can easily display alarm screens, trend and bar graphs, scrolling texts and meters. With thousands of industry-standard bitmap libraries, creating a professional interface is just a click away.



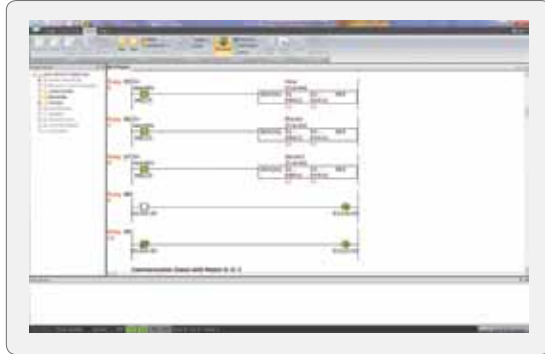
### WindLDR

All IEC PLCs—including the FT1A family—are programmed with WindLDR software. This icon-driven programming tool combines logic and intuition with an incredibly easy-to-use interface. Offline simulation, I/O Force and program bookmarks are just some of the standard features you'll find in WindLDR. Newly added for FT1A are Function Block Diagram (FBD) and Script programming. Over the years, WindLDR has proven to be the most user-friendly, intuitive software available for beginners and advanced programmers alike.



## Simulation Mode

WindLDR allows you to simulate ladder and Function Block Diagram (FBD) programs in FT1A. You can easily test and verify functionality of your ladder and FBD programs without having to connect any hardware.

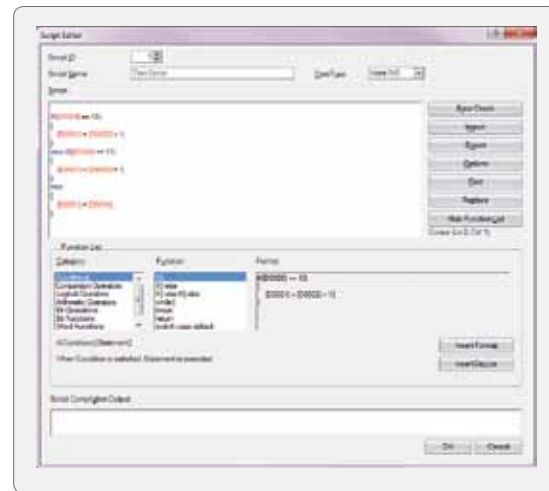


## Comment Download Settings

The comment download settings allow you to choose whether to download Tag names, rung comments, custom monitor dialog boxes or file names. The biggest advantage of utilizing these settings is that once a program is retrieved from the PLC, all these important parameters will be available.

## Function Block and Scripting

In addition to ladder logic, WindLDR now supports Function Block Diagram (FBD) and Script programming. With the FT1A controllers, you now have the flexibility and convenience of programming using any or all of these methods.



## Free 30-Day Demo






Curious to see how an IDEC FT1A SmartAXIS controller might complement your design? Find out for yourself!

# Selection Guide and Part Number Listing

## Products

Touch	Part Number	Power Voltage	Total I/O	Input Type	Output Type	Ethernet Port	Screen Type	Embedded Analog Inputs	High-Speed Counter	SD Memory Slot	RS232C, RS485 Port		
	FT1A-M12RA-W	24V DC	12 I/O (8 in, 4 out)	Sink	Relay	Yes	3.7" STN Monochrome (8 shades)	2pt, 0-10V DC, 10-bit Resolution	4 x 10kHz	—	Yes		
	FT1A-M12RA-B												
	FT1A-M12RA-S												
	FT1A-C12RA-W						3.8" TFT 65,536 colors						
	FT1A-C12RA-B												
	FT1A-C12RA-S												
12 I/O CPU													
	FT1A-H12RC	100-240V AC	12 I/O (8 in, 4 out)	Contact	Relay	—	2.1" Monochrome	—	—	—	—		
	FT1A-H12RA	24V DC		Sink				2pt, 0-10VDC, 10-bit	4 x 100kHz				
	FT1A-B12RC	100-240V AC		Contact			—	—	2pt, 0-10VDC, 10-bit			4 x 100kHz	
	FT1A-B12RA	24V DC		Sink									
24 I/O CPU													
	FT1A-H24RC	100-240V AC	24 I/O (16 in, 8 out)	Sink/Source	Relay	Yes	2.1" Monochrome	—	—	—	Optional Adapter		
	FT1A-H24RA	24V DC		Sink				4pt, 0-10VDC, 10-bit	6 x 100kHz				
	FT1A-B24RC	100-240V AC		Sink/Source			—	—	4pt, 0-10VDC, 10-bit			6 x 100kHz	
	FT1A-B24RA	24V DC		Sink									
40 I/O CPU													
	FT1A-H40RC	100-240V AC	40 I/O (24 in, 16 out)	Sink/Source	Relay	Yes	2.1" Monochrome	—	—	Yes	Optional Adapters (x2)		
	FT1A-H40RKA	24V DC		Source	Relay/Trans. Sink			6pt, 0-10VDC, 10-bit	6 x 100kHz				
	FT1A-H40RSA			Sink	Relay/Trans. Source								
	FT1A-B40RC	100-240V AC		Sink/Source	Relay		—	6pt, 0-10VDC, 10-bit	6 x 100kHz				
	FT1A-B40RKA	24V DC		Source	Relay/Trans. Sink								
	FT1A-B40RSA			Sink	Relay/Trans. Source								
48 I/O CPU													
	FT1A-H48SC	100-240V AC	48 I/O (30 in, 18 out)	Sink/Source	Transistor Source	Yes	2.1" Monochrome	—	—	Yes	Optional Adapters (x2)		
	FT1A-H48SA	24V DC		Sink	8pt, 0-10VDC, 10-bit			6 x 100kHz					
	FT1A-H48KC	100-240V AC		Sink/Source	Transistor Sink			—	—				
	FT1A-H48KA	24V DC		Source	8pt, 0-10VDC, 10-bit			6 x 100kHz					
	FT1A-B48SC	100-240V AC		Sink/Source	Transistor Source		—	8pt, 0-10VDC, 10-bit	6 x 100kHz				
	FT1A-B48SA	24V DC		Sink									
	FT1A-B48KC	100-240V AC		Sink/Source	Transistor Sink							—	—
	FT1A-B48KA	24V DC		Source	8pt, 0-10VDC, 10-bit							6 x 100kHz	

## Starter Kits

	Type	Part Number	Description
	Touch	KIT-TOUCH-MW	SmartAXIS Touch Starter Kit, Monochrome Light bezel, USB cable, 30W PS and software
		KIT-TOUCH-MB	SmartAXIS Touch Starter Kit, Monochrome Dark bezel, USB cable, 30W PS and software
		KIT-TOUCH-MS	SmartAXIS Touch Starter Kit, Monochrome Silver bezel, USB cable, 30W PS and software
		KIT-TOUCH-CW	SmartAXIS Touch Starter Kit, 65K color TFT Light bezel, USB cable, 30W PS and software
		KIT-TOUCH-CB	SmartAXIS Touch Starter Kit, 65K color TFT Dark bezel, USB cable, 30W PS and software
		KIT-TOUCH-CS	SmartAXIS Touch Starter Kit, 65K color TFT Silver bezel, USB cable, 30W PS and software
	12 I/O CPU	KIT-SMART-12-HAC	SmartAXIS Starter Kit, 12 I/O AC with display/keypad , USB cable and software
		KIT-SMART-12-BAC	SmartAXIS Starter Kit, 12 I/O AC, USB cable and software
		KIT-SMART-12-HDC	SmartAXIS Starter Kit, 12 I/O DC with display/keypad, USB cable, 30W PS and software
		KIT-SMART-12-BDC	SmartAXIS Starter Kit, 12 I/O DC, USB cable, 30W PS and software
	24 I/O CPU	KIT-SMART-24-HAC	SmartAXIS Starter Kit, 24 I/O AC with display/keypad , USB cable and software
		KIT-SMART-24-BAC	SmartAXIS Starter Kit, 24 I/O AC, USB cable and software
		KIT-SMART-24-HDC	SmartAXIS Starter Kit, 24 I/O DC with display/keypad, USB cable, 30W PS and software
		KIT-SMART-24-BDC	SmartAXIS Starter Kit, 24 I/O DC, USB cable, 30W PS and software
	40 I/O CPU	KIT-SMART-40-HAC-R	SmartAXIS Starter Kit, 40 I/O AC with display/keypad, USB cable and software
		KIT-SMART-40-BAC-R	SmartAXIS Starter Kit, 40 I/O AC, USB cable and software
		KIT-SMART-40-HDC-RK	SmartAXIS Starter Kit, 40 I/O DC with display/keypad Sink, USB cable, 30W PS and software
		KIT-SMART-40-HDC-RS	SmartAXIS Starter Kit, 40 I/O DC with display/keypad Source, USB cable, 30W PS and software
		KIT-SMART-40-BDC-RK	SmartAXIS Starter Kit, 40 I/O DC Sink outputs, USB cable, 30W PS and software
		KIT-SMART-40-BDC-RS	SmartAXIS Starter Kit, 40 I/O DC Source outputs, USB cable, 30W PS and software
	48 I/O CPU	KIT-SMART-48-HAC-K	SmartAXIS Starter Kit, 48 I/O AC with display/keypad Sink, USB cable and software
		KIT-SMART-48-BAC-K	SmartAXIS Starter Kit, 48 I/O AC Sink outputs, USB cable and software
		KIT-SMART-48-HAC-S	SmartAXIS Starter Kit, 48 I/O AC with display/keypad Source, USB cable and software
		KIT-SMART-48-BAC-S	SmartAXIS Starter Kit, 48 I/O AC Source outputs, USB cable and software
		KIT-SMART-48-HDC-K	SmartAXIS Starter Kit, 48 I/O DC with display/keypad Sink, USB cable, 30W PS and software
		KIT-SMART-48-BDC-K	SmartAXIS Starter Kit, 48 I/O DC Sink outputs, USB cable, 30W PS and software
		KIT-SMART-48-HDC-S	SmartAXIS Starter Kit, 48 I/O DC with display/keypad Source, USB cable, 30W PS and software
		KIT-SMART-48-BDC-S	SmartAXIS Starter Kit, 48 I/O DC Source outputs, USB cable, 30W PS and software

## Accessories

Part Number	Description
FT1A-PC1	RS232C communication adapter, mini-DIN type
FT1A-PC2	RS485 communication adapter, mini-DIN type
FT1A-PC3	RS485 communication adapter, screw terminal type
FT1A-PM1	Optional memory cartridge
FT9Z-PSP1PN05	Extra direct mounting hook (5 per pack)
FT9Z-1D3PN05	FT1A Touch screen protective sheet (5 per pack)
FT9Z-1E3PN05	FT1A Touch protective cover (5 per pack)
FT9Z-1A01	FT1A Touch rear mount adapter
FT9Z-1T09	FT1A Touch extra communication terminal block
FT9Z-1X03	FT1A Touch extra power supply terminal block
HG9Z-4K2PN04	FT1A Touch extra mounting brackets (4 per pack)
HG9Z-XU1PN05	USB cable lock-in (5 per pack)
HG9Z-XCM2A	USB programming cable
SW1A-W1C	Automation Organizer Software Suite



# Specifications

## General Specifications

Touch (Display Model)	
Part Number	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	10ms maximum
Dielectric Strength	Between power terminal and FG: 500V AC, 5mA, 1 minute, Between power terminal and output terminal: 2,300V AC, 5mA, 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), IP20 (Rear)
Ground	Functional grounding
Protective Grounding Conductor	AWG16
Vibration Resistance	5 to 8.4Hz half amplitude 3.5mm, 8.4 to 150Hz, Acceleration 9.8m/s <sup>2</sup> (1G) 2 hours per axis on each of three mutually perpendicular axis (IEC 61131-2)
Shock Resistance	147m/s <sup>2</sup> , 11ms, X, Y, Z directions 3 times (IEC 61131-2)
Mounting Structure	Panel mount
Weight (approx.)	300g

Operation not guaranteed when used with certain types of oils.

Pro/Lite (LCD Model/No LCD Model)		
Part Number	12-I/O Type H12RC H12RA B12RC B12RA	24-I/O Type H24RC H24RA B24RC B24RA
Rated Power Voltage	AC power: 100 to 240V AC, DC power: 24V DC	
Allowable Voltage Range	AC power: 85 to 264V AC, DC power: 20.4 to 28.8V DC (including ripple)	
Rated Power Frequency	AC power: 50 to 60Hz (47 to 63Hz)	
Power Consumption	AC Power	12-I/O: 18VA maximum, 24-I/O: 41VA maximum, 40-I/O: 48VA maximum, 48-I/O: 43VA 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: 20ms maximum; DC power: 10ms maximum	
Dielectric Strength	AC power type: Between power/input and PE terminals: 1,500V AC, 1 minute Between transistor output and PE terminals: 1,500V AC, 1 minute Between relay output and PE terminals: 2,300V AC, 1 minute Between power and input terminals: 1,500V AC, 1 minute Between power/input and transistor output terminals: 1,500V AC, 1 minute Between power/input and relay output terminals: 2,300V AC, 1 minute DC power type: Between power/input and FE terminals: 500V AC, 1 minute Between transistor output and FE terminals: 500V AC, 1 minute Between relay output and FE terminals: 2,300V AC, 1 minute Between power/input and transistor output terminals: 500V AC, 1 minute 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); DC power: 30A maximum (5ms maximum)	
Operating Temperature	0 to +55°C <sup>Note 1</sup>	
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 8.4Hz half amplitude 3.5mm, 8.4 to 150Hz, Acceleration 9.8m/s <sup>2</sup> (1G) 2 hours per axis on each of three mutually perpendicular axis (IEC 61131-2)	
Shock Resistance	147m/s <sup>2</sup> , 11ms, 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

1. FT1A Version V110 are UL, c-UL Listed at 0 to +55°C.

			Touch (Display Model)	Pro/Lite FT1A (LCD Model/No LCD Model)							
Part Number			FT1A-* 12RA-*	H12RA B12RA	H12RC B12RC	H24RA B24RA	H24RC B24RC	H40RKA H40RSA B40RKA B40RSA	H40RC B40RC	H48KA H48SA B48KA B48SA	H48KC H48SC B48KC 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: 48KB Configuration memory capacity: 5MB	12KB		48KB					
User Program Storage			Flash ROM (100,000 times)	Built-in Flash ROM (10,000 times rewritable)							
Processing Time	Basic Instruction		1850μs/1000 steps		950μs/1000 steps						
	END Processing		5ms 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, 10ms, 10ms, 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 15ms (selectable in increments of 1ms)								
Catch Input/Interrupt Input			4/4	4/4		6/6					
High-speed Counter	Maximum Counting Frequency & Points	Single/two-phase Selectable	1 (5kHz, multiple 2/4, single phase not available)	2 (100kHz /50kHz) <sup>Note 1</sup>	—	2 (100kHz /50kHz) <sup>Note 1</sup>	—	2 (100kHz /50kHz) <sup>Note 1</sup>	—	2 (100kHz /50kHz) <sup>Note 1</sup>	—
		Single-phase	4 (x 10kHz)	2 (x 100kHz)	—	4 (x 100kHz)	—	4 (x 100kHz)	—	4 (x 100kHz)	—
	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	
		Function	—	—	—	—	—	PULS, PWM, RAMP, ARAMP, ZRN	—	PULS, PWM, RAMP, ARAMP, ZRN	
	5 kHz	No. of Outputs	—	—	—	—	—	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		—	—	—	—	250mA	—	300mA	—	300mA
	Overload Detection		—	—	—	—	Not Available	—	Not Available	—	Not Available
	Insulation		—	—	—	—	Internal Circuit	—	Internal Circuit	—	Internal Circuit
USB-mini B			X	X		X		X		X	
USB-A			X	—		—		—		—	
RS232C			X	—		X <sup>Note 2</sup>		X <sup>Note 2</sup>		X <sup>Note 2</sup>	
RS485/422			X	—		X <sup>Note 2</sup>		X <sup>Note 2</sup>		X <sup>Note 2</sup>	
Ethernet			X	—		X		X		X	
Expansion Communication Ports		Port 2	—	—		X		X		X	
		Port 3	—	—		—		X		X	
Memory Cartridge			—	X		X		X		X	
SD Memory Card			—	—		—		X <sup>Note 3</sup>		X <sup>Note 3</sup>	

1. 100KHZ when single-phase, 50kHz when two-phase multiple 2.4. 2. When communication cartridge is installed. 3. The maximum capacity is 32 GB. DLOG and TRACE instructions are used to write data.

# Specifications

## Display Specifications

Touch/Pro (Display Model/Built-In LCD)			
Model		Touch	Pro (Built-in LCD)
Display Element		TFT color LCD	STN monochrome LCD
Colors/Shades		65,536 colors	Monochrome 8 shades
Effective Display Area		88.92 W x 37.05 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 30°, top 20°, bottom 40°
Contrast Adjustment		Not Available	Not Available
Backlight		LED	LED (green)
Backlight Life		50,000 hours <sup>Note 1</sup>	—
Brightness		400cd/m <sup>2</sup> <sup>Note 2</sup>	45cd/m <sup>2</sup> <sup>Note 2</sup>
Brightness Adjustment		32 levels	Not Available
Backlight Control		On/off	
Backlight Replacement		Not Available	
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 (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 (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, 5x, 6x, 7x, 8x, vertically and horizontally	—
Character Attributes		Blink, reverse, bold, shadowed (blink is 1 or 0.5sec)	Blink, reverse
Graphics		Line, polyline, polygon, rectangle, circle, ellipse, arc, pie, equilateral polygons (3, 4, 5, 6, 8), fill, picture	—
Window Display		3 pop-up screens + 1 system screen	—

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

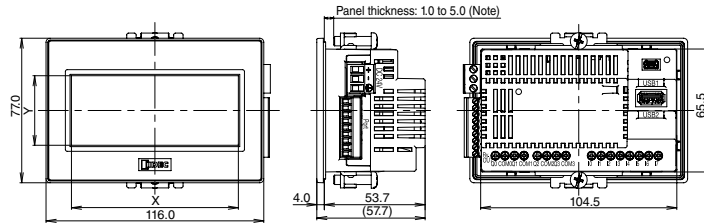
2. Brightness of LCD only (monochrome LCD: when lit white).

## Operation Specifications

Touch/Pro (Display/LCD Models)		
Model	Touch	Pro (Built-in LCD)
Switching Element	Analog resistive membrane (touch panel)	Rubber switches
Operating Force	0.2 to 2.5N	2.0N minimum
Mechanical Life	1 million operations	10,000 operations
Acknowledgment Sound	Electric Buzzer	Not provided
Multiple Press	Not possible	Possible

## Touch (Display Model)

When using mounting bracket (HG9Z-4K2PN04)

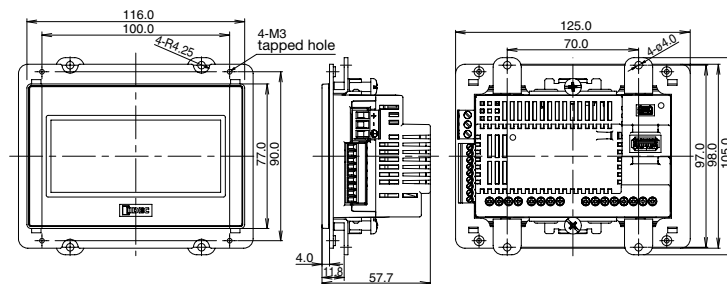


### LCD Active Area

LCD Type	X	Y
TFT	88.92	37.05
STN	87.59	35.49

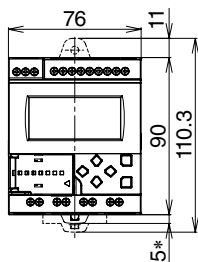
Note: Waterproof characteristics depend on panel material and size.

When using rear mount adapter (FT9Z-1A01)

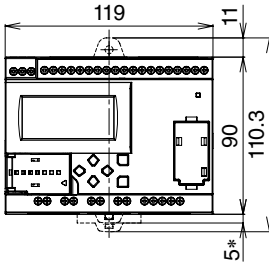


## Pro (LCD Model)

FT1A-H12\*A/\*C

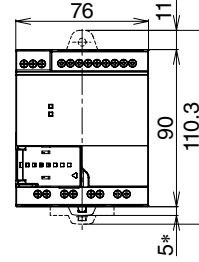


FT1A-H24\*A/\*C

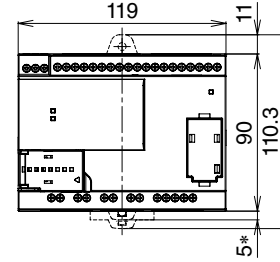


## Lite (No LCD Model)

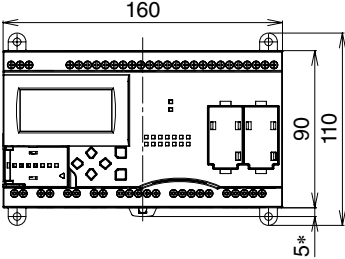
FT1A-B12\*A/\*C



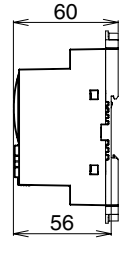
FT1A-B24\*A/\*C



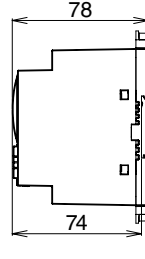
FT1A-H40\*A/\*C



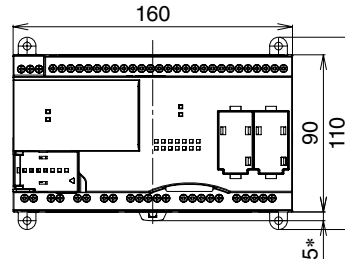
FT1A-H\*\*\*A



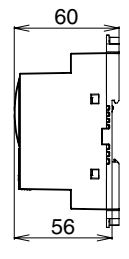
FT1A-H\*\*\*C



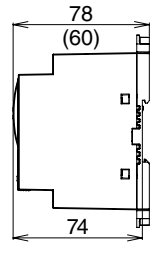
FT1A-B40\*A/\*C



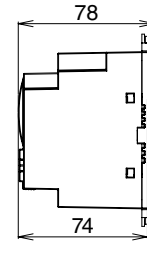
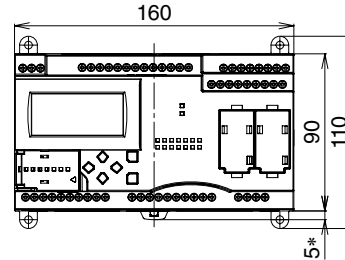
FT1A-B\*\*\*A



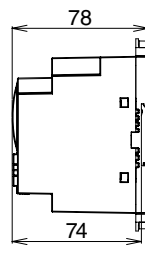
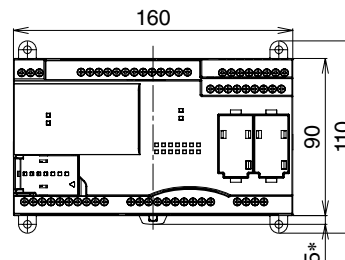
FT1A-B\*\*\*C



FT1A-H48\*A/\*C



FT1A-B48\*A/\*C



Note: 9.3 mm when the clamp is pulled out.

Note: 9.3 mm when the clamp is pulled out.

## Exceeding Industry Standards

At IDEC, we continuously strive to exceed industry standards in safety and quality, protecting our customers while safeguarding valuable equipment. We develop all our products with innovative and reliable designs, and then test to ensure they go beyond industry safety standards by enforcing the strictest quality control in the market. From our E-stops with unique safe break action, to our “dead man,” grip switches that guarantee safe and stress-free operation every time, IDEC products are unbeatable when it comes to performance and dependability.

