



Think Automation and beyond...



IDEC FT1A SmartAXIS

Value. Versatility. The New Breed of Controllers.



Value. Versatility. The New Breed of Controller!

The ideal solution for a variety of applications.

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

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-inch HMI + PLC with sophisticated features and a super-bright LCD screen is also available.

All FT1A controllers meet the highest industry standards for quality and safety. The FT1A SmartAXIS family is CE compliant, cULus listed, has an ABS type approval and is Class I Division 2 rated for hazardous locations. Whatever your application requires, the FT1A SmartAXIS family has a solution!



A Breed of Its Own

The perfect combination of PLC processing and HMI monitoring and control, the 3.8-inch FT1A Touch is an all-in-one touchscreen interface and logic controller. With a compact body and full complement of features, FT1A Touch is perfect for small systems that require a graphical user interface along with versatile I/O controls at a truly affordable price.

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

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 65K TFT Color

- 400cd/m² color
- 740cd/m² monochrome

Analog Expansion Cartridges (Transistor Output Models)

- Up to 2 analog expansion adapters can be configured on the FT1A Touch with 12-bit resolution.
- Maximum combination of 2in/6out, 4in/4out, or 6in/2out analog I/O can be configured.

RS232C and RS485 ports

- Built-in RS232C, RS422/485 interface for serial communication.
- Communication with IDEC or other PLCs also supported through this serial port.

Relay or Transistor Outputs

- Relay output type equipped with 10A contact, so no interposing relays required.
- Transistor output type equipped with 300mA per channel.

Analog Outputs (Transistor Output Models)
2 built-in 0-10VDC, 4-20mA analog outputs.

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 or 4-20mA analog inputs (transistor output models)
 - 10-bit resolution
- 4 high-speed counters
 - Up to 10kHz

Harsh Environments

- Class I, Division 2 for hazardous locations
- -20 to 55°C operating temperature (color models)

RJ45 Ethernet Port

- Supports remote Ethernet communication and Modbus TCP.
- Communication with IDEC or other PLCs also supported through the Ethernet port.

Actual Size

IP66f (water and oil tight), NEMA 4X (indoor) and 13

5MB Screen Editing Memory
Provides users with more flexibility and stress-free programming.

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Control Functions

Fast Processing Speed

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 then retrieved over an Ethernet connection or by removing the USB memory stick from the FT1A Touch and inserting it into a 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 0 | | |
| 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 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

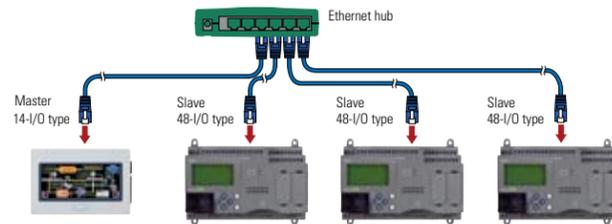
The FT1A Touch is equipped with 8 digital inputs, two of which can be configured as 0-10V DC or 4-20mA analog inputs with 10-bit resolution, reducing overall system cost.

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.

Remote I/O

Up to three FT1A controllers (24, 40 and 48 I/O) can be configured as remote I/O slaves for the FT1A Touch, expanding your system's potential. A maximum of 158 I/O can be achieved.



Analog Expansion Cartridges

Using analog expansion cartridges, FT1A Touch can accept 0-10V DC, 4-20mA, RTD and Thermocouple inputs, with 12 to 15-bit resolution.

PID Controls

With an improved PID algorithm and easier-to-configure dialog box, PID controls can be monitored using a single screen. Advanced PID control functions, such as auto-tuning, ARW (anti-reset windup) and bumpless transfer, are also supported.

Large Programming Memory

With 47.4KB of logic controls programming memory, 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.



Display Functions

Ethernet Connectivity

With the embedded RJ45 Ethernet port, FT1A project files can be remotely uploaded or downloaded over an 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/Slave) is also supported. With these capabilities, FT1A Touch can communicate with other PLCs or devices using Modbus protocol.

Ladder Program and I/O status

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 control parameter such as data register, timer, and internal relay can also be monitored and controlled.

65,536 TFT Color LCD

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

Super-Bright LED

The 65K TFT color unit is rated at 400cd/m², while the monochrome unit is rated at 740cd/m². With 32 levels of brightness control, the backlight can even be adjusted according to the surrounding conditions.

Drivers for IDEC and other PLCs

FT1A Touch can easily be configured to communicate with IDEC or other PLCs such as Siemens, Automation Direct, Mitsubishi, Omron, and more.



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.



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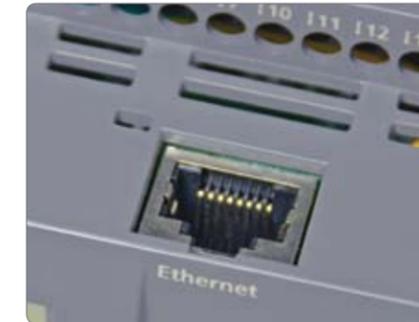
FT1A Controllers

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.

Universal Voltages
24V DC or 100-240V AC

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.

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.

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 47.4KB (11,850 steps) of programming memory, FT1A controllers have enough memory for even complex PLC programming.

SD Memory Card

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.



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.

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.



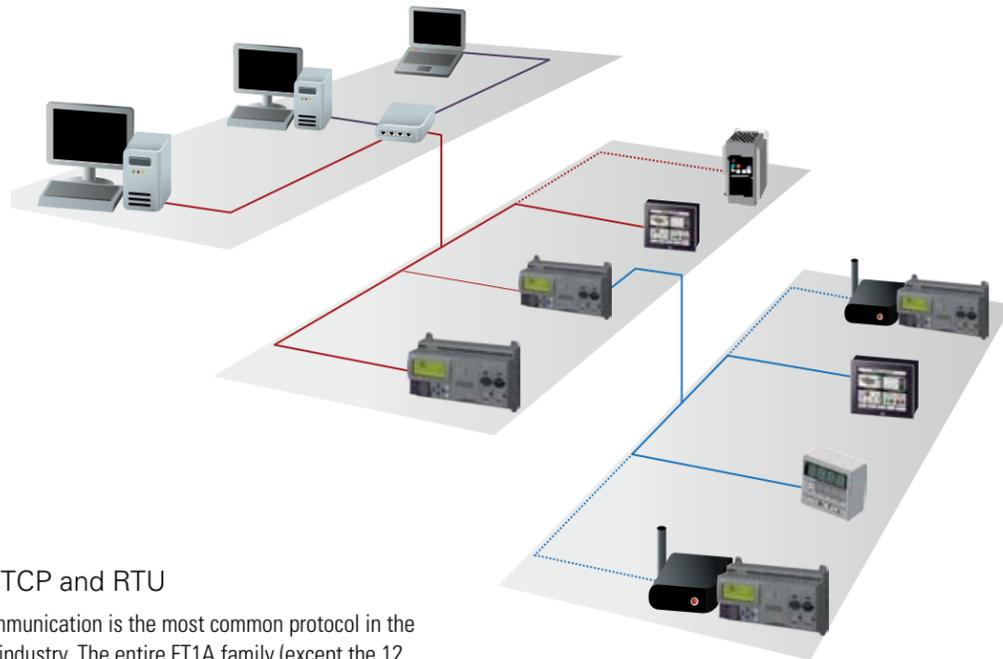
Note: Features available on specific models. See page 14 for selection guide.

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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

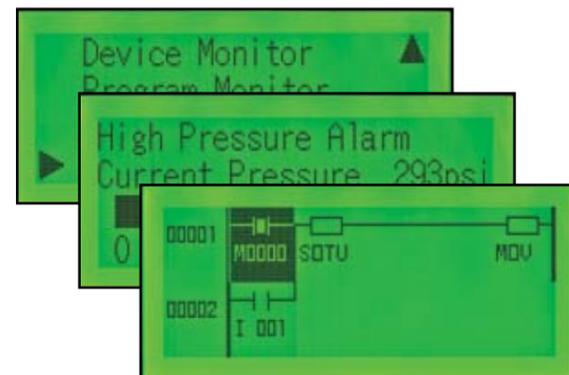
Thanks to the embedded RJ45 Ethernet port (on all models except 12 I/O), FT1A controllers can be easily accessed from remote locations. Using WindLDR software, PLC programs can be updated remotely and critical parameters monitored and controlled. Remote connectivity is a critical part of today's control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

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.

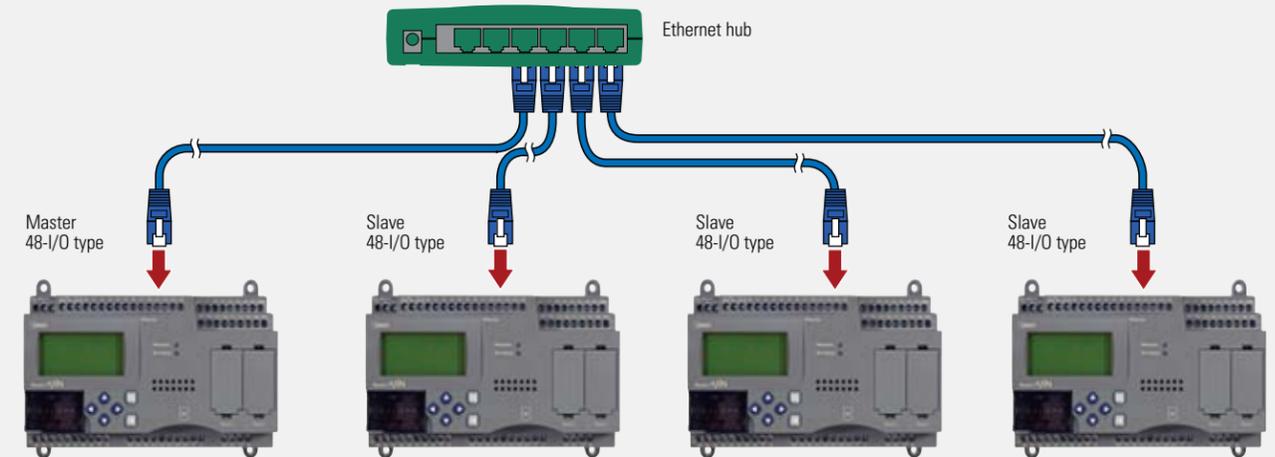
Smart LCD Display

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.



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.

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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 HMI configuration software, WindO/I-NV3 FT1A Touch configuration software, and WindCFG system configuration software. AO is an all-in-one automation software package for IDEC PLCs and IDEC HMIs. The news gets even better, because AO software upgrades are always FREE.

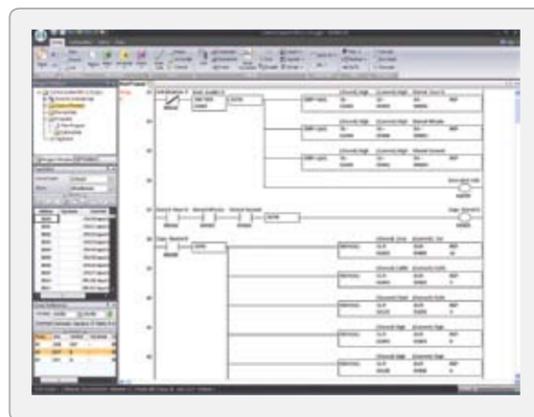
WindO/I-NV3

WindO/I-NV3 is our exclusive configuration software for the FT1A Touch. Using the same platform as WindO/I-NV2 HG HMI 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.



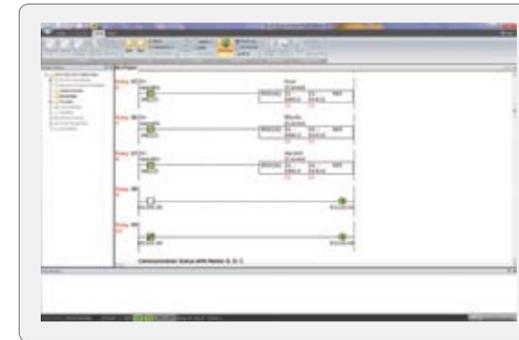
WindLDR

All IDEC 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.

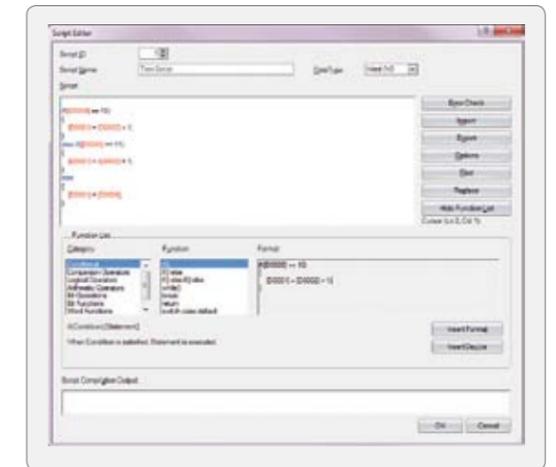


Comment Download Settings

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!

Just go to www.IDEC.com/download and download your free 30-day demo.

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Touch Part Numbers

| Touch | Part Number | Screen Type | Total I/O | Input Type | Embedded Analog Inputs | Embedded Analog Outputs | Output Type | Analog Expansion Cartridges | Power Voltage | Remote I/O Master |
|-------|--------------|--------------------------------|----------------------|------------|--|--|-------------------|-----------------------------|---------------|-------------------|
| | FT1A-M14KA-W | 3.7" STN Monochrome (8 shades) | 14 I/O (8 in, 6 out) | Source | 2pt (0-10VDC, 4-20mA, 10-bit Resolution) | 2pt (0-10VDC, 4-20mA, 10-bit Resolution) | Transistor Sink | Yes, up to 2 cartridges | 24V DC | Yes |
| | FT1A-M14KA-B | | | | | | | | | |
| | FT1A-M14KA-S | | | | | | | | | |
| | FT1A-M14SA-W | | | | | | | | | |
| | FT1A-M14SA-B | | | | | | | | | |
| | FT1A-M14SA-S | 3.8" TFT 65,536 colors | 14 I/O (8 in, 6 out) | Sink | 2pt (0-10VDC, 4-20mA, 10-bit Resolution) | 2pt (0-10VDC, 4-20mA, 10-bit Resolution) | Transistor Source | Yes, up to 2 cartridges | 24V DC | Yes |
| | FT1A-C14KA-W | | | | | | | | | |
| | FT1A-C14KA-B | | | | | | | | | |
| | FT1A-C14KA-S | | | | | | | | | |
| | FT1A-C14SA-W | | | | | | | | | |
| | FT1A-M12RA-W | 3.7" STN Monochrome (8 shades) | 12 I/O (8 in, 4 out) | Sink | 2pt (0-10VDC, 10-bit Resolution) | — | Relay | — | — | — |
| | FT1A-M12RA-B | | | | | | | | | |
| | FT1A-M12RA-S | | | | | | | | | |
| | FT1A-C12RA-W | | | | | | | | | |
| | FT1A-C12RA-B | | | | | | | | | |
| | FT1A-C12RA-S | 3.8" TFT 65,536 colors | 12 I/O (8 in, 4 out) | Sink | 2pt (0-10VDC, 10-bit Resolution) | — | Relay | — | — | — |
| | FT1A-C12RA-S | | | | | | | | | |

Touch Starter Kits

| Part Number | Description |
|---------------|---|
| KIT-TOUCH-□KW | FT1A Touch Starter Kit, Transistor sink output type, Light bezel, USB cable, 30W PS and software |
| KIT-TOUCH-□KB | FT1A Touch Starter Kit, Transistor sink output type, Dark bezel, USB cable, 30W PS and software |
| KIT-TOUCH-□KS | FT1A Touch Starter Kit, Transistor sink output type, Silver bezel, USB cable, 30W PS and software |
| KIT-TOUCH-□SW | FT1A Touch Starter Kit, Transistor source output type, Light bezel, USB cable, 30W PS and software |
| KIT-TOUCH-□SB | FT1A Touch Starter Kit, Transistor source output type, Dark bezel, USB cable, 30W PS and software |
| KIT-TOUCH-□SS | FT1A Touch Starter Kit, Transistor source output type, Silver bezel, USB cable, 30W PS and software |
| KIT-TOUCH-□W | FT1A Touch Starter Kit, Relay output type, Light bezel, USB cable, 30W PS and software |
| KIT-TOUCH-□B | FT1A Touch Starter Kit, Relay output type, Dark bezel, USB cable, 30W PS and software |
| KIT-TOUCH-□S | FT1A Touch Starter Kit, Relay output type, Silver bezel, USB cable, 30W PS and software |

In place of □ insert code for display type: C = color, M = monochrome

Touch Accessories

| Part Number | Description |
|--------------|---|
| FC6A-PJ2A | 2-pt 0-10V, 4-20mA Analog input cartridge |
| FC6A-PJ2CP | 2-pt RTD, Thermocouple cartridge |
| FC6A-PK2AV | 2-pt 0-10V Analog output cartridge |
| FC6A-PK2AW | 2-pt 4-20mA Analog output cartridge |
| 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 |

Controller 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) |
| SW1A-W1C | Automation Organizer Software Suite |
| HG9Z-XCM2A | USB programming cable |

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Controller Part Numbers

| 12 I/O CPU | 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-H12RC | 100-240V AC | 12 I/O (8 in, 4 out) | Contact | Relay | — | 2.1" Monochrome | — | — | — | — |
| | FT1A-H12RA | 24V DC | | Sink | | | | | | | |
| | FT1A-B12RC | 100-240V AC | | Contact | | | | | | | |
| | FT1A-B12RA | 24V DC | | Sink | | | | | | | |
| | FT1A-H24RC | 100-240V AC | 24 I/O (16 in, 8 out) | Sink/Source | Relay | Yes | 2.1" Monochrome | 4pt, 0-10VDC, 10-bit | 6 x 100kHz | — | Optional Adapter |
| | FT1A-H24RA | 24V DC | | Sink | | | | | | | |
| | FT1A-B24RC | 100-240V AC | | Sink/Source | | | | | | | |
| | FT1A-B24RA | 24V DC | | Sink | | | | | | | |
| | FT1A-H40RC | 100-240V AC | 40 I/O (24 in, 16 out) | Sink/Source | Relay | Yes | 2.1" Monochrome | 6pt, 0-10VDC, 10-bit | 6 x 100kHz | Yes | Optional Adapters (x2) |
| | FT1A-H40RKA | 24V DC | | Source | Relay/Trans. Sink | | | | | | |
| | FT1A-H40RSA | | | Sink | Relay/Trans. Source | | | | | | |
| | FT1A-B40RC | 100-240V AC | | Sink/Source | Relay | | | | | | |
| | FT1A-B40RKA | 24V DC | | Source | Relay/Trans. Sink | | | | | | |
| | FT1A-B40RSA | | | Sink | Relay/Trans. Source | | | | | | |
| | FT1A-H48SC | 100-240V AC | 48 I/O (30 in, 18 out) | Sink/Source | Transistor Source | Yes | 2.1" Monochrome | 8pt, 0-10VDC, 10-bit | 6 x 100kHz | Yes | Optional Adapters (x2) |
| | FT1A-H48SA | 24V DC | | Sink | Transistor Sink | | | | | | |
| | FT1A-H48KC | 100-240V AC | | Sink/Source | Transistor Sink | | | | | | |
| | FT1A-H48KA | 24V DC | | Source | Transistor Sink | | | | | | |
| | FT1A-B48SC | 100-240V AC | | Sink/Source | Transistor Source | | | | | | |
| | FT1A-B48SA | 24V DC | | Sink | Transistor Source | | | | | | |
| | FT1A-B48KC | 100-240V AC | | Sink/Source | Transistor Sink | | | | | | |
| | FT1A-B48KA | 24V DC | | Source | Transistor Sink | | | | | | |

Controller Starter Kits

| Type | Part Number | Description |
|------------|---------------------|---|
| 12 I/O CPU | KIT-SMART-12-□AC | SmartAXIS Starter Kit, 12 I/O AC, USB cable and software |
| | KIT-SMART-12-□DC | SmartAXIS Starter Kit, 12 I/O DC, USB cable and software |
| 24 I/O CPU | KIT-SMART-24-□AC | SmartAXIS Starter Kit, 24 I/O AC with display/keypad, USB cable and software |
| | KIT-SMART-24-□DC | SmartAXIS Starter Kit, 24 I/O DC, USB cable and software |
| 40 I/O CPU | KIT-SMART-40-□AC-R | SmartAXIS Starter Kit, 40 I/O AC, USB cable and software |
| | KIT-SMART-40-□DC-RK | SmartAXIS Starter Kit, 40 I/O DC, USB cable and software |
| 48 I/O CPU | KIT-SMART-40-□DC-RS | SmartAXIS Starter Kit, 40 I/O DC, Source outputs, USB cable, 30W PS and software |
| | KIT-SMART-48-□AC-K | SmartAXIS Starter Kit, 48 I/O AC with display/keypad Sink, USB cable and software |
| | KIT-SMART-48-□AC-S | SmartAXIS Starter Kit, 48 I/O AC Source outputs, USB cable and software |
| | KIT-SMART-48-□DC-K | SmartAXIS Starter Kit, 48 I/O DC Sink outputs, USB cable, 30W PS and software |
| | KIT-SMART-48-□ADC-S | SmartAXIS Starter Kit, 48 I/O DC Source outputs, USB cable, 30W PS and software |

In place of □ insert code: H = includes display/keypad, B = without display/keypad

General Specifications

| Touch (PLC + HMI) | |
|--|--|
| Part Number | FT1A-*12RA-* FT1A-*14KA-* / FT1A-*14SA-* |
| Output | Relay output Transistor output |
| Rated Power Voltage | 24V DC |
| Allowable Voltage Range | 20.4 to 28.8V DC (including ripple) |
| Power Consumption | 9.2W maximum 10.1W 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 Between power terminal and output terminal: 500V AC, 5mA, 1 minute |
| EMC Immunity | IEC/EN 61131-2:2007 compliant |
| Inrush Current | 50A maximum (5ms maximum) |
| Operating Temperature | Color display: -20 to +55°C, Monochrome display: 0 to +55°C ^{Note 2} |
| 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, Type 4X & 13 (Panel front) ^{Note 1} , IP20 (Rear) |
| Ground | Functional grounding |
| Protective Grounding Conductor | UL1007 AWG16 |
| Vibration Resistance | 5 to 8.4Hz half amplitude 3.5mm, 8.4Hz to 150Hz acceleration 9.8m/s ² (1G), 2 hours per axis on each of three mutually perpendicular axis (IEC 61131-2) |
| Shock Resistance | 147m/s ² , 11ms, X, Y, Z directions 3 times (IEC 61131-2) |
| Mounting Structure | Panel mount |
| Weight (approx.) | 300g 250g |

1. Operation not guaranteed when used with certain types of oils. 2. FT1A-*12RA-* hardware version V130 and earlier is UL, c-UL listed at 0 to +50°C.

| Pro/Lite (LCD Model/No LCD Model) | | 12-I/O Type | 24-I/O Type | 40-I/O Type | 48-I/O Type |
|--|----------|---|--------------------------------|--|--|
| Part Number | | H12RC / H12RA B12RC / B12RA | H24RC / H24RA B24RC / B24RA | H40RC / H40RKA / H40RSA B40RC / B40RKA / B40RSA | H48KC / H48SC / H48KA / H48SA B48KC / B48SC / B48KA / B48SA |
| 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, 5mA, 1 minute Between transistor output and PE terminals: 1,500V AC, 5mA, 1 minute Between relay output and PE terminals: 2,300V AC, 5mA, 1 minute Between power and input terminals: 1,500V AC, 5mA, 1 minute Between power/input and transistor output terminals: 1,500V AC, 5mA, 1 minute Between power/input and relay output terminals: 2,300V AC, 5mA, 1 minute DC power type: Between power/input and FE terminals: 500V AC, 5mA, 1 minute Between transistor output and FE terminals: 500V AC, 5mA, 1 minute Between relay output and FE terminals: 2,300V AC, 5mA, 1 minute Between power/input and transistor output terminals: 500V AC, 5mA, 1 minute Between power/input and relay output terminals: 2,300V AC, 5mA, 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 ^{Note 1} | | | |
| 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, 8.4Hz to 150Hz acceleration 9.8m/s ² (1G), 2 hours per axis on each of three mutually perpendicular axis(IEC 61131-2) | | | |
| Shock Resistance | | 147m/s ² , 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 | | | |

FT1A Version V110 are UL, c-UL Listed at 0 to +50°C.

| | | Touch (PLC + HMI) | | Pro/Lite FT1A (LCD Model/No LCD Model) | | | | | | | |
|---|--|--|--|--|-------------|-------------|-------------|-----------------------------|-------------|-------------------------|-------------------------|
| Part Number | | FT1A-*12RA-* (Relay) | FT1A-*14KA-* (Sink) FT1A-*14SA-* (Source) | H12RA B12RA | H12RC B12RC | H24RA B24RA | H24RC B24RC | H40RKA H40RSA B40RKA B40RSA | H40RC B40RC | H48KA H48SA B48KA B48SA | H48KC B48SC B48KA B48SA |
| Control System | | Stored program system | | | | | | | | | |
| Instruction Words | | 42 types | | | | | | | | | |
| Basic Instructions | | 98 types | | | | | | | | | |
| Advanced Instructions | | 99 types | | | | | | | | | |
| Program Capacity | | Program size: 47.4KB Configuration memory capacity: 5MB Flash ROM (100,000 times) | | | | | | | | | |
| User Program Storage | | Built-in Flash ROM (10,000 times rewritable) | | | | | | | | | |
| Processing Time | | Basic Instruction: 1850µs/1,000 steps END Processing: 5msec minimum | | | | | | | | | |
| Function Block ^{Note 1} | | 37 types | | | | | | | | | |
| Function Block Program Capacity | | Program size: 38KB Configuration memory capacity: 5MB | | | | | | | | | |
| No of Function Blocks | | 1,000 | | | | | | | | | |
| Timer (T) / Counter (C) | | 200 / 200 | | | | | | | | | |
| Processing Time | | Basic Instruction: 4ms/100 END Processing: 5ms minimum | | | | | | | | | |
| I/O Points | | Inputs / Outputs: 8 / 4 | | | | | | | | | |
| Analog Input / Output | | 2 / - | | | | | | | | | |
| Internal Relays / Shift Registers | | 1024 / 128 | | | | | | | | | |
| Data Registers / Special Data Registers | | 2000 / 200 | | | | | | | | | |
| Adding/Reversible Counters | | 200 | | | | | | | | | |
| Timer (1ms, 10ms, 100ms, 1s) | | 200 | | | | | | | | | |
| Clock | | Precision: ±30 seconds/month (25°C, typical) | | | | | | | | | |
| RAM Backup | | Internal relays, shift registers, counters, data registers, clock data / Approximately 30 days (typical) at 25°C after backup battery is fully charged | | | | | | | | | |
| Backup Data / Backup Duration | | Lithium secondary battery / Approximately 15 hours required to charge from 0 to 90% | | | | | | | | | |
| Battery / Charging Time | | Not possible | | | | | | | | | |
| 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 | | | | | | | | | |
| High-speed Counter | | 1 (5kHz, multiple 2/4, single phase not available) | | | | | | | | | |
| Maximum Counting Frequency & Points | | 2 ^{Note 2} | | | | | | | | | |
| Single-phase | | 4 (x 10kHz) | | | | | | | | | |
| Counting Range | | 0 to 4,294,967,295 (32 bits) | | | | | | | | | |
| Operation Mode | | Rotary encoder mode and adding counter mode | | | | | | | | | |
| Points | | 2 | | | | | | | | | |
| Input Range | | 0 to 10V DC | | | | | | | | | |
| Input Impedance | | 78kΩ | | | | | | | | | |
| Digital Resolution | | 0 to 1,000 (10 bits) | | | | | | | | | |
| Output Type | | 10A Relay | | | | | | | | | |
| Built-in Points | | 2 | | | | | | | | | |
| Output Range | | 0 to 10V DC (voltage output) / 4 to 20mA (current output) | | | | | | | | | |
| Digital Resolution | | 0 to 1,000 (10 bits) | | | | | | | | | |
| Pulse Outputs | | No. of Outputs: 2 | | | | | | | | | |
| Function | | PULS, PWM, RAMP, ARAMP, ZRN | | | | | | | | | |
| No. of Outputs | | 2 | | | | | | | | | |
| Function | | PULS, PWM | | | | | | | | | |
| Output Voltage | | 24V DC (+10%, -15%) | | | | | | | | | |
| Output Current | | 300mA | | | | | | | | | |
| Overload Detection | | Not Available | | | | | | | | | |
| Insulation | | Internal Circuit | | | | | | | | | |
| USB-mini B ^{Note 3} | | X | | | | | | | | | |
| USB-A ^{Note 3} | | X | | | | | | | | | |
| RS232C ^{Note 3} | | X | | | | | | | | | |
| RS485/422 ^{Note 3} | | X | | | | | | | | | |
| Ethernet | | X | | | | | | | | | |
| Expansion Communication | | Port 2: X, Port 3: X | | | | | | | | | |
| Memory Cartridge | | X | | | | | | | | | |
| SD Memory Card | | X ^{Note 5} | | | | | | | | | |
| Analog Cartridge Interface | | Number of Ports: 4, Connectable Cards: 2 | | | | | | | | | |

1. Except for timer, counter, input Function Block, and output Function Block. 2. 100kHz when single-phase, 50kHz when two-phase multiple 2.4. 3. Not isolated from internal circuits. 4. When communication cartridge is installed. 5. The maximum capacity is 32 GB. DLOG and TRACE instructions are used to write data.

Display Specifications

| Touch/Pro (PLC + HMI/Built-In LCD) | | | |
|------------------------------------|--|---|---|
| Model | Touch | | Pro (Built-in LCD) |
| 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 Available | 32 levels | Not Available |
| Backlight | LED | LED (white, red, pink) | LED (green) |
| Backlight Life | 50,000 hours ^{Note 1} | | — |
| Brightness | 400cd/m ² ^{Note 2} | 740cd/m ² ^{Note 2} | 45cd/m ² ^{Note 2} |
| 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 (PLC + HMI/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 |

Analog Cartridge Specifications (Touch Transistor Output Model)

| Part No. | FC6A-PJ2A | FC6A-PJ2CP | FC6A-PK2AV | FC6A-PK2AW |
|---------------------|--------------------------------------|-------------------|--------------------------|---------------------------|
| Type | Voltage/Current Output | Temperature Input | Voltage Output | Current Output |
| Rated Voltage | 5.0V, 3.3V (supplied from the Touch) | | | |
| Consumption Current | 5.0V: — 3.3V: 30mA | | 5.0V: 70mA 3.3V: 30mA | 5.0V: 185mA 3.3V: 30mA |
| Weight | 15g | | | |

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Input Specifications

| Part No. | FC6A-PJ2A | | FC6A-PJ2CP | | |
|---|---|---|--|---|--|
| Input Type | Voltage input | Current Input | Resistance Thermometer | Thermocouple | |
| Input Range | 0 to 10V DC | 4 to 20mA DC 0 to 20mA DC | Pt100: -200 to +850°C Pt1000: -200 to +600°C Ni100: -60 to +180°C Ni1000: -60 to +180°C 3-wire RTD | K: -200 to 1300°C J: -200 to 1000°C R: 0 to 1760°C S: 0 to 1760°C B: 0 to 1820°C E: -200 to 800°C T: -200 to 800°C N: -200 to 1300°C C: 0 to 2315°C | |
| Input Impedance | 1MΩ min. | 250Ω max. | 1MΩ min. | | |
| Allowable Conductor Resistance | — | | 10Ω max | | |
| Input Detection Current | — | | Typ: 0.2mA, 1.0mA max. | | |
| A/D Conversion | Sample Duration Time | 10ms | 250ms | | |
| | Sample Interval | 20ms | 500ms | | |
| | Total Input System Transfer Time | 20ms + 1 scan | | 500ms + 1 scan | |
| | Type of Input | Single-ended input | | | |
| | Operating Mode | Self-Scan | | | |
| | Conversion Method | SAR | | | |
| | Maximum Error at 25°C | ±0.1% of full scale | ±0.1% of full scale | ±0.1% of full scale Cold junction compensation accuracy ±4.0°C or less. Exceptions R, S thermocouple error: ±6.0°C (0 to 200°C range only) B thermocouple error: Not guaranteed (0 to 300°C range only) K, J, E, T, N thermocouple error: ±0.4% of full scale (0°C or lower range only) | |
| Temperature Coefficient | ±0.02%/°C of full scale | | | | |
| Reproducibility After Stabilization Time | ±0.5% of full scale | | | | |
| Non-linearity | ±0.01% of full scale | | | | |
| Maximum Error | ±1.0% of full scale | | | | |
| Data | Digital Resolution | 4096 increments (12 bit) | | Pt100: 10,500 (14bit) Pt1000: 8000 (13 bit) Ni100: 2400 (12 bit) Ni1000: 2400 (12bit) K: 15,000 (14 bit) J: 12,000 (14 bit) R: 17,600 (15 bit) S: 17,600 (15 bit) B: 18,200 (15 bit) E: 10,000 (14 bit) T: 6,000 (13 bit) N: 15,000 (14 bit) C: 23,150 (15 bit) | |
| | LSB Input Value | 2.44mV (0 to 10V DC) | 4.88μA (DC0 to 20mA) 3.91μA (DC4 to 20mA) | 0.1°C 0.18°F | |
| | Data Format in Application | Can be arbitrarily set for each channel in the range of -32,768 to 32,773 | | | |
| | Monotonicity | Yes | | | |
| Noise Resistance | Maximum Temporary Deviation During Electrical Noise Tests | ±4.0% full scale max. | | | |
| | Recommended Cable | Shielded twisted pair | | | |
| | Crosstalk | 1LSB max. | | | |
| Isolation | None | | | | |
| Effect When Input is Incorrectly Wired | No damage | | | | |
| Maximum Allowable Constant Load (non-destructive) | 13V DC | 40mA | 13V DC | | |
| Input Type Modification | Software programming | | | | |
| Calibration to Maintain Rated Accuracy | Impossible | | | | |

Output Specifications

| Part No. | PC6A-PK2AV | FC6A-PK2AW | |
|--|---|---------------------------|--------------------|
| Type | Voltage Output | Current Output | |
| Output Type | Voltage Output | 0 to 10V DC | |
| Output Type | Current Output | — | |
| Output Type | Current Output | 4 to 20mA DC | |
| Load | Impedance | 2kΩ min. | |
| Load | Impedance | 500kΩ max. | |
| D/A Conversion | Load Type | Resistance Load | |
| | Cycle Time | 20ms | |
| | Settling Time | 40ms max. | 20ms max. |
| D/A Conversion | Total Output System Transfer Time | 60ms+1 scan | 40ms+1 scan |
| | Maximum Error at 25°C | ±0.3% of full scale | |
| Output Error | Temperature Coefficient | ±0.02%/°C of full scale | |
| | Reproducibility after Stabilization Time | ±0.4% of full scale | |
| | Non-linearity | ±0.01% of full scale | |
| | Output Ripple | 30mV max. | |
| | Overshoot | 0% | |
| | Maximum Error | ±1.0% of full scale | |
| | Effect of Improper Output Terminal Connection | No damage | |
| Data | Digital Resolution | 4096 increments (12 bits) | |
| | LSB Output Value | 2.44mV (0 to 10V) | 3.91μA (4 to 20mA) |
| | Data Format in Application | 0 to 4095 (0 to 10V) | |
| | Monotonicity | Yes | |
| Noise Resistance | Open Current Loop | — | Cannot be detected |
| | Maximum Temporary Deviation During Electrical Noise Tests | ±4.0 full scale max. | |
| | Recommended Cable | Shielded twisted pair | |
| Crosstalk | 1 LSB max. | | |
| Isolation | None | | |
| Calibration to Maintain Rated Accuracy | Impossible | | |
| Selection of Output Signal Type | Voltage output only | Current output only | |

Applicable Wire

| Cartridge Part No. | FC6A-PJ2A | FC6A-PJ2CP | FC6A-PK2AV | FC6A-PK2AW |
|--------------------|--|----------------------------------|--|------------|
| Applicable Wire | 0.3mm ² (AWG22) shielded twisted pair | 0.3mm ² (AWG22) cable | 0.3mm ² (AWG22) shielded twisted pair | |

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