



From FT1A Touch to FT1J series

Replacement Guide



Revision History

October 2024 First edition

Introduction

About this document

This document is a manual for replacing the integrated display controller FT1A Touch with the FT1J series.

Related Documents

Please also refer to the following manuals.

- FT1A Series SmartAXIS Touch User's Manual (B-1390)
- FT1A Series SmartAXIS Ladder Programming Manual (B-1382)
- WindO/I-NV4 User's Manual (B-1701)
- Ladder Programming Manual (B-2342)
- SmartAXIS Hardware Manual (B-2339)

Please download the latest manual from our website.

[HOME >PRODUCTS >OPERATOR INTERFACES >PLC+HMI >FT1J 4.3INCH PLC+HMI](#)

Abbreviations, generic terms, and terms used in this book

Item	Explanation
FT1A Touch	This is a general term for the following model numbers: FT1A-C12RA-*, FT1A-C14KA-*, FT1A-C14SA-*, FT1A-M12RA-*, FT1A-M14KA-*, FT1A-M14SA-*
FT1A-C	The abbreviation for the following model numbers: FT1A-C12RA-*, FT1A-C14KA-*, FT1A-C14SA-*
FT1A-M	The abbreviation for the following model numbers: FT1A-M12RA-*, FT1A-M14KA-*, FT1A-M14SA-*
FT1A Touch (relay output type)	The abbreviation for the following model numbers: FT1A-C12RA-*, FT1A-M12RA-*
FT1A Touch (transistor output type)	The abbreviation for the following model numbers: FT1A-C14KA-*, FT1A-C14SA-*, FT1A-M14KA-*, FT1A-M14SA-*
FT1J series	This is a general term for the following model numbers: FT1J-4F12RAG-*, FT1J-4F14KAG-*, FT1J-4F14SAG-*
FT1J series (relay output type)	The abbreviation for the following model numbers: FT1J-4F12RAG-*
FT1J series (transistor output type)	The abbreviation for the following model numbers: FT1J-4F14SAG-*, FT1J-4F14KAG-*
HMI Function	This refers to the functions based on the screen and settings of the main unit created with WindO/I-NV4.
Control Function	This refers to the control function based on ladder programs and settings created with WindLDR.
Project	This refers to all data, including screen data, used to operate the main unit, created by WindO/I-NV4 and WindLDR launched from WindO/I-NV4.

Notes

When changing the product series of a project, please read this manual carefully and understand the differences in functions and performance before proceeding. After changing the product series, please make sure to thoroughly check the operation before installing it. In particular, the ladder programs and screen content for the following items will need to be modified due to differences in function and performance.

Item	Explanation	Detail
Startup Time and Performance	The FT1J series has a longer startup time than the FT1A Touch. The rendering process will have a shorter cycle, but you will need to thoroughly check the operation after changing the product series of your project.	Chapter 5 "2.1 Startup time", "2.2 Performance improvement"
I/O Device	After changing the product series of the project, you will need to manually replace the address numbers.	Chapter 5 "1.1 I/O Device"
Control Device	On the FT1A Touch, it is treated as an internal device, however, on the FT1J series, it is treated as the device address of the external device. Thus, some setting items cannot be used with the FT1J series.	Chapter 5 "2.3 Control Device"
Internal Clock	The method for changing the date and time data of the internal clock is different.	Chapter 6 "2.13 Internal Clock"

For other differences related to software specifications, please refer to Chapter 3 "Software specification comparison".

Table of Contents

Revision History	i
Introduction	ii
About this document	ii
Related Documents	ii
Abbreviations, generic terms, and terms used in this book	ii
Notes	iii
Chapter 1 Names of each part	
1 FT1A Touch (relay output type)	1
2 FT1A Touch (transistor output type)	2
3 FT1J series	3
Chapter 2 Hardware specification comparison	
1 Appearance	4
2 Performance Specifications	5
2.1 Display	5
2.2 Touch Panel	5
2.3 Backup Data	6
3 Interface Specifications	6
3.1 Cartridge Slot	6
3.2 Input terminal	6
3.3 Output terminal	8
4 General Specifications	9
Chapter 3 Software specification comparison	
1 HMI Function	10
2 Control Function	11
2.1 List of corresponding command differences	12
3 Internal Device	12
3.1 HMI device	12
3.2 Control Device	13
Chapter 4 Replacement Procedure	
1 Converting a project (*.nft to *.pn4)	14
2 Download	15
Chapter 5 Adjustments after project conversion	
1 Control Functions	16
1.1 I/O Device	16
1.2 Function Settings	16
1.3 Clock-related function	17
2 HMI Function	17
2.1 Startup time	17
2.2 Performance improvement	18
2.3 Control Device	19
2.4 Parts	20
2.5 Base screen overlay	20

2.6	Installed Fonts in the Main Unit.....	21
2.7	Prohibited characters	22
2.8	Communication Driver	22

Chapter 6 Other specification differences

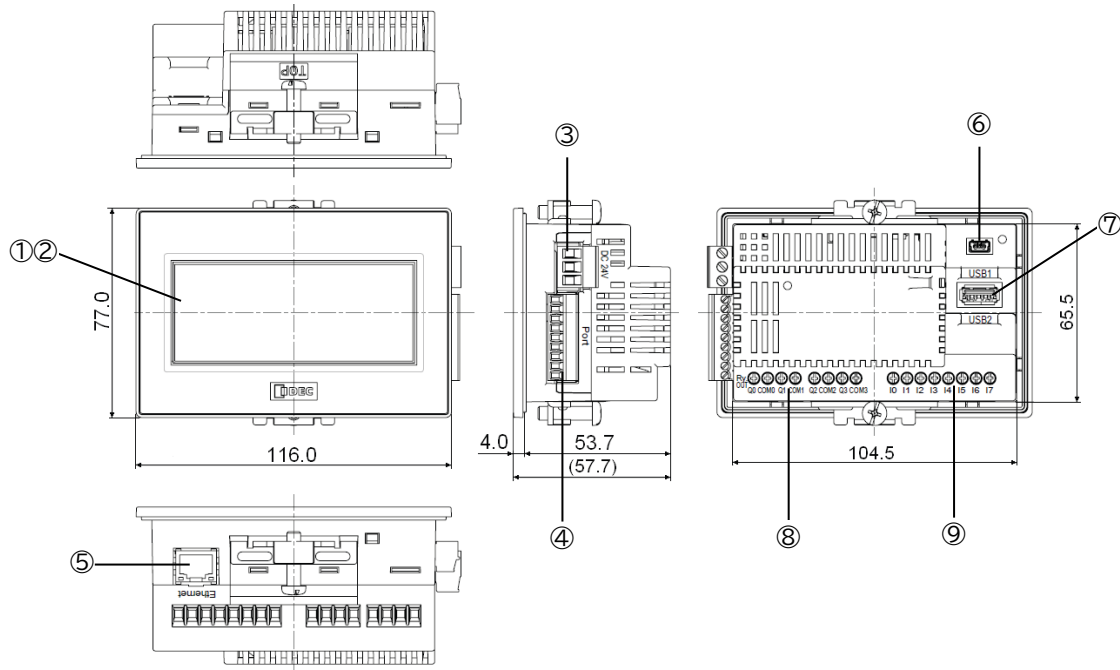
1	Main unit operation specifications	23
1.1	Control function operation	23
1.2	Changing timer and counter settings	24
1.3	Resetting after switching to System Mode	24
1.4	Clear after download	24
2	WindO/I-NV3 and WindO/I-NV4	25
2.1	Ribbon > Configuration tab	25
2.2	Ribbon > Online tab.....	25
2.3	Protocol Manager.....	25
2.4	Screen window alignment.....	25
2.5	Print Function.....	26
2.6	Text Manager	26
2.7	Library Screen	26
2.8	Grouping of object lists	26
2.9	Setting characters and device addresses.....	26
2.10	Terms.....	26
2.11	Cartridge Settings	27
2.12	System software version number	27
2.13	Internal Clock.....	27
3	Downloader and Data File Manager.....	27

Chapter 7 References

1	Terminal arrangement and wiring example	28
1.1	FT1A Touch.....	28
1.2	FT1J series.....	29
2	Rules for Converting to the top layer	31

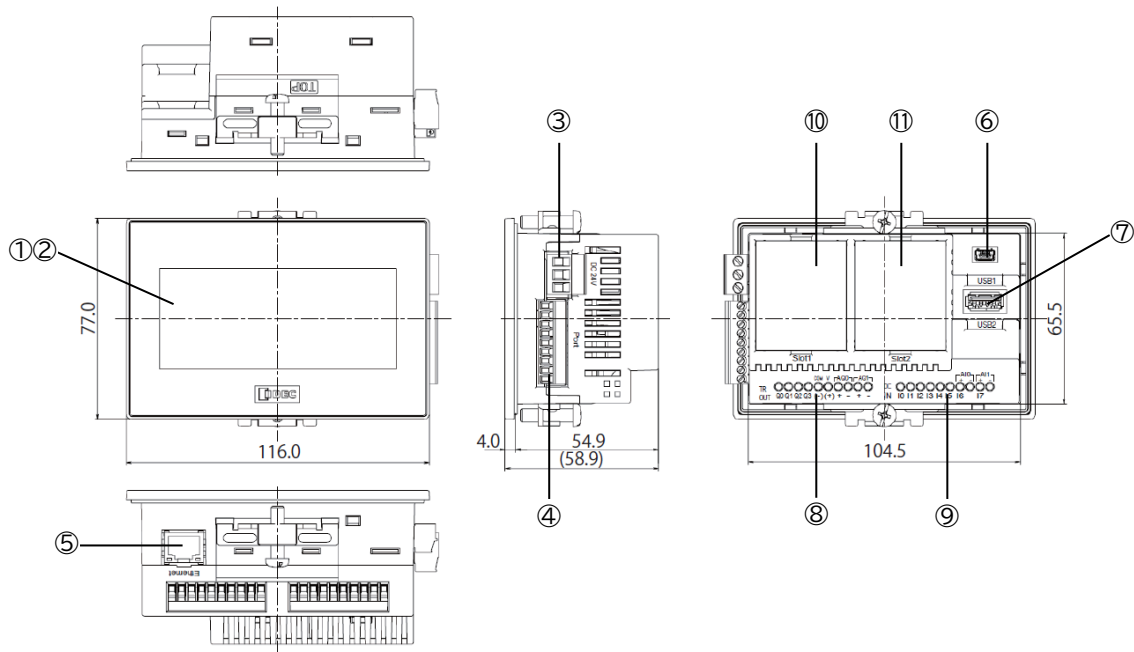
Chapter 1 Names of each part

1 FT1A Touch (relay output type)



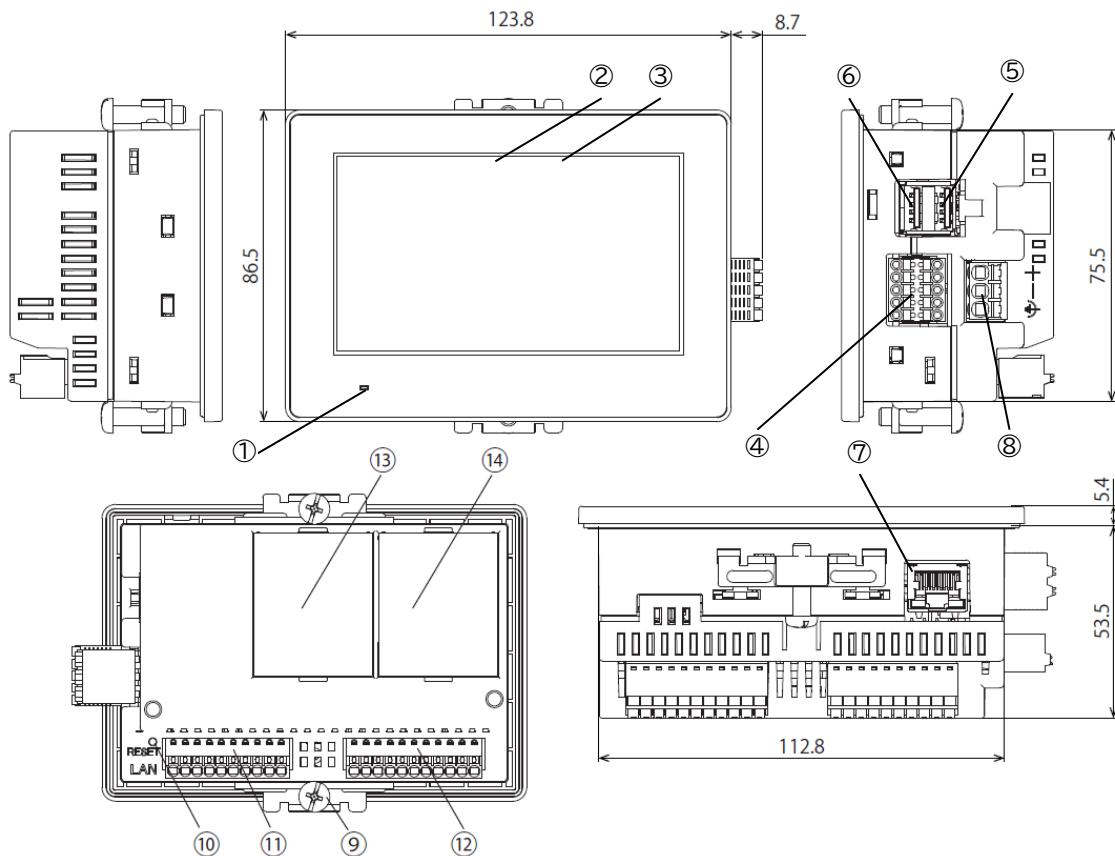
No.	Name
(1)	Display
(2)	Touch Panel
(3)	Power Supply terminal (24V DC)
(4)	Serial Interface (Port)
(5)	Ethernet Interface (Ethernet)
(6)	USB interface (USB1)
(7)	USB interface (USB2)
(8)	Output terminals (Q0 to Q3)
(9)	Input terminals (I0 to I7)

2 FT1A Touch (transistor output type)



No.	Name
(1)	Display
(2)	Touch Panel
(3)	Power Supply Terminal (24V DC)
(4)	Serial Interface (Port)
(5)	Ethernet Interface (Ethernet)
(6)	USB interface (USB1)
(7)	USB interface (USB2)
(8)	Output terminals (Q0 to Q3, AQ0, AQ1)
(9)	Input terminals (I0 to I7)
(10)	Cartridge slot (Slot1)
(11)	Cartridge slot (Slot2)

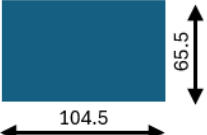
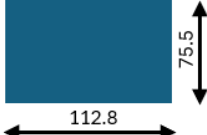
3 FT1J series



No.	Name
(1)	POWER LED
(2)	Display
(3)	Touch Panel
(4)	Serial Interface (COM)
(5)	USB interface (USB1)
(6)	USB interface (USB2)
(7)	Ethernet Interface (LAN)
(8)	Power Supply Terminal
(9)	Mounting Clip Position
(10)	RESET Switch
(11)	Input Terminal (IN)
(12)	Output Terminal (OUT)
(13)	Cartridge Slot (Slot1)
(14)	Cartridge Slot (Slot2)

Chapter 2 Hardware specification comparison

1 Appearance

Item	FT1A Touch (Relay output type)	FT1A Touch (Transistor output type)	FT1J series
External Dimension	116.0(W)x77.0(H)x57.7(D) mm	116.0(W)x77.0(H)x58.9(D) mm	123.8(W)x86.5(H)x58.9(D) mm
Panel Cut-Out	104.5(W)x65.5(H)mm 		112.8(W)x75.5(H)mm 
Mounting Clip Position	2 locations		
Power Supply Terminal	Screw-fastening type		Push-in type
Serial Interface Terminal	Screw-fastening type		Push-in type

2 Performance Specifications

Item	FT1A Touch	FT1J series
Display	See Chapter 2 "2.1 Display"	
Touch Panel	See Chapter 2 "2.2 Touch Panel"	
User Memory Capacity	Approximately 5MB	Approximately 24MB
Backup Data	See Chapter 2 "2.3 Backup Data"	

2.1 Display

Item	FT1A-M	FT1A-C	FT1J series
LCD Type	STN Monochrome LCD	TFT Color LCD	TFT Color LCD
Display Color	2 Colors (Black, White) 8 shades	65,536 colors	16,777,216 colors
Effective Display Area	87.59(W)x35.49(H) mm	88.92(W)x37.05(H) mm	95.04(W)x53.856(H) mm
Display Resolution	240(W)x100(H) pixels		480(W)x272(H) pixels
Screen Size (Aspect Ratio)	12:5		16:9
Dot Pitch (Aspect Ratio)	1:1		
View Angle	Left/Right/Top/Bottom: 45°	Left/Right: 40° Top: 20° Bottom: 60°	Left/Right/Top/Bottom: 80°
Contrast Adjustment	32 levels	None	
Brightness of LCD only	White: 740cd/m ² Red: 135cd/m ²	400cd/m ²	500cd/m ² *1
Brightness adjustment	32 levels		
Backlight	LED (White, Red) Screen color: White, Pink, Red	LED (white)	
Backlight Life	Approx. 50,000 hours		

2.2 Touch Panel

Item	FT1A Touch	FT1J series
Switch Type	Analog Resistive Film	Projected Capacitive
Operating touch panel while wearing gloves	Possible	For gloves less than 1.5mm thick, possible
Multiple Operations	Impossible	Possible (2-point touch)

*1 The FT1J series utilizes a high-transparency cover with a glass-coated touch panel, resulting in a brighter appearance compared to previous models in terms of perceived brightness.

2.3 Backup Data

Item	FT1A Touch	FT1J series
Clock data retention period (operating ambient temperature 25°C)	Approximately 30 days	Approximately 20 days (held by a large-capacity capacitor)
Retention period of log data, HMI Keep Relay, HMI Keep Register, Internal Relay, Shift Register, counter, data register (operating ambient temperature 25°C)	Approximately 30 days	No deadline (stored in non-volatile memory)
Battery life (model case: 9 hours charge, 15 hours discharge)	5 years	No batteries required* ¹

3 Interface Specifications

Item	FT1A Touch	FT1J series
Serial Interface	Removable terminal block 9 pin RS232C: 1ch, RS422/485: 1ch	Removable terminal block 10 pin RS232C: 1ch, RS422/485: 1ch
Ethernet Interface	Yes (printed: Ethernet)	Yes (printed: LAN)
USB Interface	Mini-B (printed: USB1)	Type A (printed: USB1)
	Type A (printed: USB2)	
Maintenance Communication	USB1, Ethernet: Supported USB2: Not supported	LAN: Supported USB1, USB2: Not supported
Cartridge Slot	See Chapter 2 "3.1 Cartridge Slot"	
Input terminal	See Chapter 2 "3.2 Input terminal"	
Output terminal	See Chapter 2 "3.3 Output terminal"	

3.1 Cartridge Slot

Item	FT1A Touch (Relay output type)	FT1A Touch (Transistor output type)	FT1J series
Number of Cartridge Slots	none	2	
Compatible Cartridges	none	FC6A-PN4, FC6A-PTS4, FC6A-PTK4, FC6A-PJ2A, FC6A-PJ2CP, FC6A-PK2AV, FC6A-PK2AW	

3.2 Input terminal

Item	FT1A Touch	FT1J series
Input Points	8 points	
Digital Input	See Chapter 2 "Digital Input"	
Analog Input	See Chapter 2 "Analog Input"	

For wiring examples, see Chapter 7 "1 Terminal arrangement and wiring example".

*¹ For the FT1J series, there is no checkbox for **Enable Low Battery Warning** on the **System** tab of the **Project Settings** dialog box of WindO/I-NV4.

● Digital Input

Item	FT1A-*12RA-*, FT1A-*14SA-*	FT1A-*14KA-*	FT1J-4F12RAG-*, FT1J-4F14SAG-*	FT1J-4F14KAG-*
Input Circuit Type	Sink input	Source input	Sink input	Source input
Input Points (Terminal No. /Common Line Name)	6 points in 1 common line (I0 to I5/Power supply(+) terminal)	6 points in 1 common line (I0 to I5/Power supply(-) terminal)	6 points in 1 common line (I0 to I5/Power supply(-) terminal)	6 points in 1 common line (I0 to I5/Power supply(+) terminal)

● Analog Input

Item	FT1A Touch (Relay output type)	FT1A Touch (Transistor output type)	FT1J series
Input Electrical Characteristic	Voltage (0 to 10V DC)		Voltage or current (0 to 10V DC/4 to 20mA)
Input Points* ¹ (Terminal Number)	2 points in 1 common line (I6, I7/Power supply(-) terminal)	2 points (AI0+, AI1+/AI0-, AI1-)	2 points (I12, I13/COM0(-) terminal, COM1(-) terminal)
Digital Resolution	1000 (10bit)		4096 (12bit)
Data Type	Binary data: 0 to 1000		Binary data: 0 to 4095 Optional range: -32768 to 32767
AD Conversion	Sampling Time	2 ms max.	5 ms max.
	Sampling Repetition Time	2 ms max.	5 ms max.
	Total Input Delay Time	Varies depending on input electrical characteristics Voltage: 3 ms+1 filtering time+1 scan time Current: 12 ms+1 filtering time+1 scan time	

● Pulse Input

Item	FT1A Touch	FT1J series	
High-speed Counter	Maximum frequency of single-phase high-speed counter	10kHz	20kHz
	Maximum frequency of two-phase high-speed counter (2-edge count)	5kHz	10kHz
	Maximum frequency of two-phase high-speed counter (4-edge count)	2.5kHz	5kHz
Catch Input	Minimum Pulse Width On Time	50 μ s	25 μ s
	Minimum Pulse Width Off Time	50 μ s	25 μ s
Frequency Measurement	Measurement range	200Hz to 10kHz	1Hz to 20kHz

*¹ Digital input shared

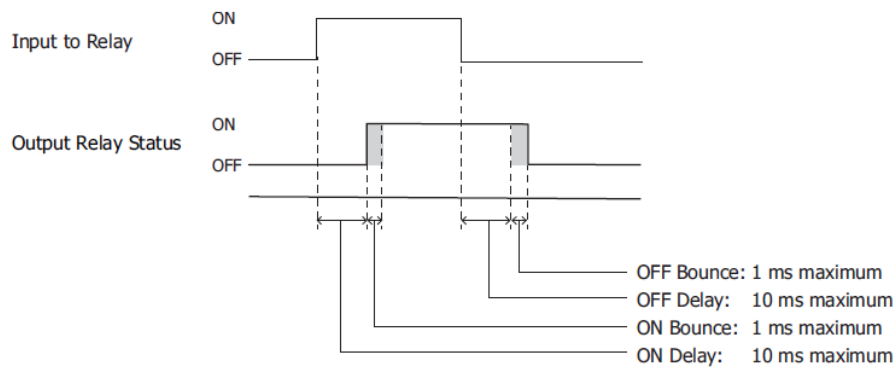
3.3 Output terminal

● Digital Output

Relay Output

Item	FT1A Touch (relay output type)	FT1J series (relay output type)
Output Points (Terminal Number)	4 points (Q0 to Q3)	
Maximum Load Current	10A	1 point 2A or less, 1 common line 2A or less
Minimum Switching Load	10mA, 5V DC (reference value)	1mA, 5V DC (reference value)
Initial Contact Resistance	100mΩ max.	30mΩ max.
Rated Load Current	250V AC 10A, 30V DC 10A	240V AC 2A, 30V DC 2A

Relay output delay



Item	FT1A Touch (relay output type)	FT1J series (relay output type)
ON delay	6ms maximum	10ms maximum
ON Bounce	6ms maximum	1ms maximum
OFF Delay	330ms maximum	10ms maximum
OFF Bounce	-	1ms maximum

Transistor Output

Item	FT1A-*14KA-*	FT1A-*14SA-*	FT1J-4F14KAG-*	FT1J-4F14SAG-*
Output Circuit Type	Sink output	Source output	Sink Output	Source Output
Output Points	4 points (Q0 to Q3)			
Maximum Load Current	0.3A		1 point 0.5A, 1 common line 2A	

● Analog Output

Item	FT1A Touch (transistor output type)	FT1J series (transistor output type)
Output Electrical Characteristics	Voltage/Current (0 to 10 V DC / 4 to 20mA DC)	
Output Points	2 points	
Digital Resolution	1000 (10bit)	4096 (12bit)
Data Format	Binary data: 0 to 1000	Binary data: 0 to 4095 Optional range: -32768 to 32767

4 General Specifications

Item	FT1A Touch (Relay output type)	FT1A Touch (Transistor output type)	FT1J series (Relay output type)	FT1J series (Transistor output type)
Ambient Temperature	FT1A-M: 0 to +55°C (no freezing) FT1A-C: -20 to +55°C (no freezing)		-20 to +55°C(no freezing)*1	
Rated Voltage	DC24V			
Power Consumption	9.2W max. When USB2 is unused: 5.8W max.	10.1W max. When USB2 is unused: 8.1W max.	13W max. When USB1, USB2, IN, OUT, Slot1, Slot2 are unused: 5W max. And when backlight is OFF: 3W max.	15W max. When USB1, USB2, IN, OUT, Slot1, Slot2 are unused: 5W max. And when backlight is OFF: 3W max.
Inrush Current	50A max.		40A max.	
Startup Time	3 Seconds		13 Seconds	
External memory	USB memory			

*1 The upper limit of the output current of the USB interface varies depending on the installation orientation and the ambient temperature during use. For more information, please refer to the SmartAXIS Hardware Manual (B-2339).

Chapter 3 Software specification comparison

Item	FT1A Touch	FT1J series
Maximum size of project data	HMI function: 5,177,344 bytes Control function: 94,800 bytes	HMI function: 25,165,824 bytes Control Function: 124,928 bytes
HMI Function	See "1 HMI Function"	
Control Function	See "2 Control Function"	
Internal Device	See "3 Internal Device"	

1 HMI Function

Item	FT1A Touch	FT1J series	Detail	
Startup time	3 seconds	13 seconds	Chapter 5 "2.1 Startup time"	
Performance	Due to the significant improvement over the FT1J series, there are some points to note.		Chapter 5 "2.2 Performance improvement"	
Internal processing of the control device	Equivalent to HMI device	Equivalent to the device address of the external device	Chapter 5 "How the control device is handled internally"	
Data storage area	102,400 bytes	112,640 bytes	-	
Drawings	Fill	Supported	Not supported	The object (Fill) will be deleted, so please replace it with another object if necessary.
Parts	Selector Switch, Potentiometer	Supported	Not supported	Chapter 5 "Selector Switch, Potentiometer"
	Recover Background for Pilot Lamp, Multi-State Lamp, and Picture Display	Supported	Not supported	Chapter 5 "Pilot Lamp, Multi-State Lamp, Picture Display"
Rendering of overlay screens	Differences may occur if certain conditions are met.		Chapter 5 "2.5 Base screen overlay"	
Tag Editor	Tag name containing colon	Possible	impossible	Chapter 5 "Tag Name"
File names, folder names, and commands	Certain symbol characters, two consecutive periods	Possible	Impossible	Chapter 5 "File and folder name"
Built-in fonts	Bitmap Fonts	Outline Fonts	Chapter 5 "2.6 Installed Fonts in the Main Unit"	
Communication Driver	Koyo	Supported	Not supported	Chapter 5 "2.8 Communication Driver"
	YOKOGAWA	Supported	Not supported	
	Hitachi Industrial Equipment Systems	Supported	Not supported	

2 Control Function

Item		FT1A Touch	FT1J series	Detail
Supported Programs		Ladder Program FBD Program	Ladder Program	After the change, the FBD program is deleted, and an empty ladder program is created.
Minimum execution interval		5ms	-	Chapter 6 "FT1A Touch"
Ladder Program	Week Programmer instruction (WEEK, YEAR) trigger conditions	none	M8022 has a value of 1	Chapter 5 "Week Programmer instruction (WEEK, YEAR)"
Digital I/O Cartridge	Address Number Range	I10 to I17 Q4 to Q7	I20 to I27 Q10 to Q17	Chapter 5 "1.1 I/O Device"
Memory Backup	Counter	Clear Specified Range	Keep Specified Range	Chapter 5 "1.2 Function Settings"
	Data Register			
High-Speed Counter > Group 5	Frequency Measurement	Supported	Not supported	Chapter 5 "1.2 Function Settings"
Analog Input, Analog Output	Data Format	Binary Data	Binary data, Optional range	Chapter 5 "1.2 Function Settings"
Ladder Program Monitor		Supported	Not supported* ¹	Chapter 5 "1.2 Function Settings"
Watchdog Timer	Maximum	5000ms	4000ms	Chapter 5 "1.2 Function Settings"
Daylight Saving Time		Set using WindLDR	Set using WindO/I-NV4	Chapter 5 "Daylight Saving Time"
Timing when clock-related functions can be executed		After boot	After the HMI function is started	Chapter 5 "Week Programmer instruction (WEEK, YEAR)"
Remote I/O		Supported	Not supported* ²	Chapter 5 "1.2 Function Settings"

*¹ The FT1J series does not have an **LCD Settings** tab in the **Function Area Settings** dialog box of WindLDR.

*² The FT1J series does not have a **Connection Settings** tab in the **Function Area Settings** dialog box of WindLDR. Remote I/O can be achieved by combining with the SX8R series.

2.1 List of corresponding command differences

For details about the corresponding instructions, see the programming manual in "Related Documents". Below is the list of the differences between the FT1A Touch and FT1J series.

● Calculation Instruction

Item		FT1A Touch	FT1J series
Binary Arithmetic	RNDM	Not supported	Supported
Program Branching	FRQRF	Not supported	Supported
Week Programmer	YEAR WEEK	Supported	Supported* ¹
Pulse	PULS PWM	Not supported	Supported
PID Instruction	PIDA	Supported* ²	Supported
	PIDD	Not supported	Supported
Flow	FLWP SCALE FLWA	Not supported	Supported

● Macro Instructions

Item	FT1A Touch	FT1J series
UMACRO	Not supported	Supported

3 Internal Device

The internal device address number ranges are different.

3.1 HMI device

● Bit Device

Device Type	FT1A Touch	FT1J series
LM (HMI Internal Relay)	0 to 2047	0 to 4095
LK (HMI Keep Relay)	Variable	
LTC (HMI Timer Contact)	0 to 31	
LBM (HMI Temporary Relay)	0 to 127	0 to 255
LSM (HMI Special Internal Relay)	0 to 63	0 to 127

*¹ Trigger conditions must be fulfilled. For details, see Chapter 5 "Week Programmer instruction (WEEK, YEAR)".

*² The function of the PID command of the FT1A Touch is equivalent to that of the PIDA command of the FT1J series.

● Word Device

Device Type	FT1A Touch	FT1J series
LDR (HMI Data Register)	0 to 8191	0 to 16383
LKR (HMI Keep Register)	Variable	
LTD (HMI Timer Current Value)	0 to 31	
LBR (HMI Temporary Register)	0 to 127	0 to 255
LSD (HMI Special Data Register)	0 to 255	0 to 511

3.2 Control Device

● Bit Device

Device Type	FT1A Touch	FT1J series	
I (Input)	Built-in	0 to 5	
	Built-in (Analog common)	6 to 7	12 to 13 (IOREF not available)
	Cartridge slot (Slot1)	10 to 13	20 to 23
	Cartridge slot (Slot2)	14 to 17	24 to 27
Q (Output)	Built-in	0 to 3	
	Cartridge slot (Slot1)	4 to 7	10 to 13
	Cartridge slot (Slot2)	10 to 13	14 to 17
M (Internal Relay)	0 to 1277	0 to 7997	
M (Special Internal Relay)	8000 to 8177		
R (Shift Register)	0 to 127		
T (Timer Contact)	0 to 199		
C (Counter Contact)	0 to 199		

● Word Device

Device Type	FT1A Touch	FT1J series
TC (Timer Current Value)	0 to 199	
TP (Timer Preset Value)	0 to 199	
CC (Counter Current Value)	0 to 199	
CP (Counter Preset Value)	0 to 199	
D (Data Register)	0 to 1999	0 to 3999
D (Special Data Register)	8000 to 8199	
P (Index Register)	Not supported	0 to 151

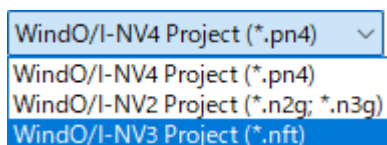
Chapter 4 Replacement Procedure

- 1 Execute the product series change in the project.
(⇒ "1 Converting a project (*.nft to *.pn4)")
- 2 Edit the project.
(⇒ Chapter 5 "Adjustments after project conversion")
- 3 Download the project to the FT1J series.
(⇒ "2 Download")

For differences in software specifications between the FT1A Touch and FT1J series, please refer to Chapter 6 "Other specification differences". However, there is no need to take these differences into account when following the replacement procedure mentioned above.

1 Converting a project (*.nft to *.pn4)

- 1 Prepare the project (*.nft) to be replaced.
If the project (*.nft) is in the FT1A Touch, upload it using WindO/I-NV3 and back up the project (*.nft).
- 2 Start the WindO/I-NV4 version 3.1.0 or later.
The **Select Product Series** dialog box is displayed.
- 3 Click **Cancel** to close the **Select Product Series** dialog box.
- 4 Click the application button and then click **Open**.
The **Open** dialog box is displayed.
- 5 In the drop-down list to the right of the **File name**, select "WindO/I-NV3 Project (*.nft)".
The project (*.nft) is displayed in the main window.



- 6 Select the project (*.nft) prepared in step 1 and click **Open**.
The **Change Product Series** dialog box is displayed.
- 7 In the **Set Conversion Option**, make sure that **Zooming Conversion** is selected, and click **OK**.
A warning message is displayed.
- 8 Check the message and click **OK**.
The **Destination path for Convert** dialog box is displayed.
- 9 Specify the **file name** after the data conversion and click **Save**.
Data conversion starts.
- 10 When the data conversion is complete, click **Close**.
The converted project is displayed.
- 11 Edit the project.
For setting items that need to be edited after the conversion, please refer to Chapter 5 "Adjustments after project conversion".

2 Download

Download the converted project to the FT1J series.

- 1 Connect the computer and the FT1J series with an Ethernet cable.
- 2 On the WindO/I-NV4 **Online** tab, under **Transfer**, click **Download**.
The **Download** dialog box is displayed.
- 3 Click **Comm. Settings...** button.
The **Communication Settings** dialog box is displayed.
- 4 In **Network Adapter**, select the network adapter*¹ to be used for communication, and click **OK**.
You are returned to the **Download** dialog box.
- 5 Click the **Search** button.
Information about the FT1J series found through a search on the network will be displayed in the list.
- 6 Select the check box for the FT1J series you want to download from the list and click **Download**.
Download starts. However, the project is downloaded only if the PC and FT1J are on the same subnetwork*².

*¹ You can check your network adapter from Windows **Control Panel > Network and Sharing Center > Change adapter settings**.

*² If the PC and FT1J are not on the same subnetwork, a confirmation message is displayed. Click **Yes** on the confirmation message, then click **Yes** in the **User Account Control** dialog box to display an information message stating that an IP address has been added to your computer. Click **OK** on the information message and the download begins.

Chapter 5 Adjustments after project conversion

1 Control Functions

1.1 I/O Device

Each I/O Device has a different device address assignment. After changing the product series, please replace the address number manually.

Device Type		FT1A Touch	FT1J series
I(Input)	Built-in	0 to 5	0 to 5
	Built-in (Analog common)	6 to 7	12 to 13 (IOREF not available)
	Cartridge Slot (Slot1)	10 to 13	20 to 23
	Cartridge Slot (Slot2)	14 to 17	24 to 27
Q(Output)	Built-in	0 to 3	0 to 3
	Cartridge Slot (Slot1)	4 to 7	10 to 13
	Cartridge Slot (Slot2)	10 to 13	14 to 17

1.2 Function Settings

The setting items that differ depending on the product series are as follows. Please check the results of the product series change.

Function Settings		FT1A Touch (Relay output type)	FT1A Touch (Transistor output type)	FT1J series	Results of changing device
Memory Backup	Counter	Clear Specified Range		Keep Specified Range	It will be “keep everything”. Please check if this will have any impact on your project operation.
	Data Register				
Input/Output*1	Special Input > Group 5 > Frequency Measurement	Supported		Not supported	It will become “normal input” and all related settings will be deleted. Please check if this will have any impact on your project operation.
	Analog/Digital Input	0 to 1000 (fixed)		0 to 4095 (fixed) or "arbitrary"	This can be “arbitrarily specified” from “0 to 1000”.
	Analog Output	-	0 to 1000 (fixed)		
LCD Settings	Ladder Program Monitor > Enable ladder program monitor on FT1A	Supported		Not supported	It cannot be monitored on the main unit screen. Use the Monitor in the Online tab of WindLDR.
Self Diagnostic	Watchdog Timer Settings > Watchdog Timer	Maximum 5000ms		Maximum 4000ms	Any value greater than 4000ms will be changed to 4000ms.
Connection Settings	Connections	Supported		Not supported	The number of I/O points on the main unit cannot be expanded.

*1 FT1A Touch (relay output type) is Input

1.3 Clock-related function

Clock data is handled differently. With the FT1A Touch, the clock-related functions of the HMI functions are set in the HMI function settings, and the clock-related functions of the control functions are set in the control function settings. In the FT1J series, the clock data is managed by the HMI function, so the control function cannot handle the clock data until the HMI function has started.

If you are using the following functions, please manually correct the various settings after changing your device.

- Daylight Saving Time
- Week Programmer instruction (WEEK, YEAR)
- Instructions that use clock data

● Daylight Saving Time

Daylight saving time can be set in the following places:

FT1A Touch: WindLDR **Calendar & Clock** in the **Function Area Setting** dialog box

FT1J: WindO/I-NV4 **Project Settings** dialog box, **Internal Clock** tab

● Week Programmer instruction (WEEK, YEAR)

When executing the WEEK or YEAR instruction on the FT1J, the HMI function must be running.

Set these commands to be executed when the HMI function startup completion flag (M8022) is set to 1. When the value of M8022 is 0, executing these instructions will result in the value of **D1 (output)** being 0.

2 HMI Function

2.1 Startup time

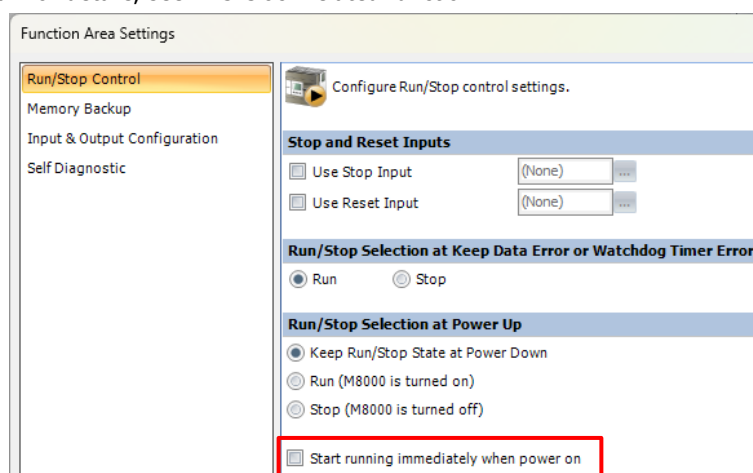
The FT1J series has a longer startup time than the FT1A Touch.

Adjust your project so that an additional 10 seconds of SmartAXIS startup time does not impact your system.

With the FT1J series, you can start operating the control function without waiting for the HMI function to start up.

To enable this function, select **Run/Stop Control** in the **Function Area Setting** dialog box of WindLDR, and check the **Start running immediately when power on** check box under **RUN/STOP Selection at Power Up**.

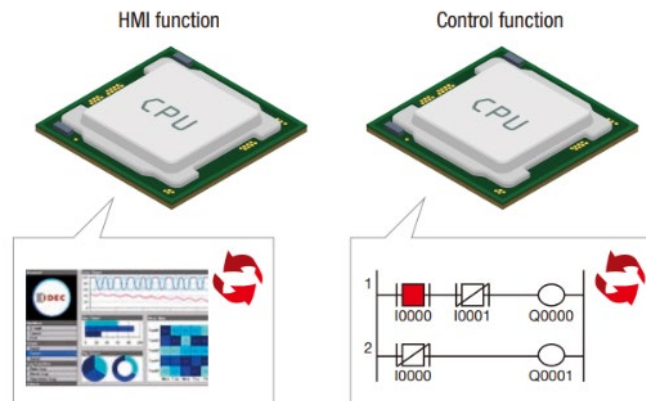
However, if you select the **Start running immediately when power on** check box, please be careful when handling the clock data. For details, see "1.3 Clock-related function"



The FT1J series displays a black screen by default until the HMI function starts up. To display an alternative image, select the **Display a Picture at Startup** check box on the **System Settings** tab of the WindO/I-NV4 **Project Settings** dialog box, and then set the image you want to display.

2.2 Performance improvement

The FT1J series has a dual CPU configuration, which means that its processing speed is significantly faster than that of the FT1A Touch (single CPU configuration), so processes such as reading and writing device address values of external devices and screen rendering processes are executed in shorter cycles.



The overview of the process for reading and writing the device address value of an external device using the HMI function is as follows:

- 1) The read or write request is stored in a queue.
- 2) When a request is ready to be sent, the CPU gets the next request from the queue and sends it.

With the FT1J series, the frequency of 1) occurring will be higher than with the FT1A Touch, but because the processing speed of the external device does not change, the frequency of 2) occurring will be the same as when the FT1A Touch was being used. Therefore, if you have a project in which you frequently run global scripts or script commands that read and write large amounts of device address values for external devices on the FT1A Touch, the queue waiting to be sent may overflow after conversion to the FT1J series, and, for example, operations on the touch panel may not be accepted. In this case, please reduce the number of device addresses of the external devices that you want to read from or write to, extend the execution period of the global script, script command, or do both.

The following table summarizes the differences in the process of reading and writing the device address values of external devices, an issue that may result from these differences, and how to resolve them.

Item		FT1A Touch	FT1J series
Differences in the process of reading and writing the device address the value of an external device	1) Read/write queue storage	Slow	Fast
	2) Send queue execution	Same (depends on external device)	
An issue that may result from the differences		Operation on the touch panel is possible	Operation on the touch panel is not possible
How to resolve the issue		-	Reduce script reading and writing points. Extend the execution period of the script.

Moreover, in the FT1J series, the screen rendering process and communication with external devices are executed asynchronously. So if the FT1A Touch project is created based on the assumption that the device address of a specific external device changes during the first and second screen scans, the converted FT1J series project may result in a different behavior; the value of the device address may stay the same on both scans. In such cases, you can resolve this by using countermeasures like extending the time between the first and second scans with a timer command.

2.3 Control Device

● How the control device is handled internally

In the FT1A SmartAXIS Touch User's Manual (B-1390) and the WindO/I-NV4 User's Manual (B-1701), the control device is described as an "internal device" just like the HMI device. However, FT1A Touch internally treats the control device as an internal device. As for the FT1J series, a control device is treated as a device address of the external device. Consequently, with the FT1J series, you cannot set the control device to settings that don't allow the device address of the external device. You must set the HMI device instead.

Following settings must set HMI device after changing the product series

Dialog Box	Tab	Setting Item Name	
Project Settings	Communication Interface	Interface Configuration: Ethernet > Protocol# > Function: User Communication#	Specify the IP address and port number as the device address value.
	Communication Driver	Manufacturer: other than Not used	Ignore communication errors and continue operation
			Batch monitoring the communication error information for all Station Numbers
			Monitoring communication error information for each station, individually
	User Communication	Command List > Command Settings Dialog Box	Completed Device Address
			Status Device Address
			Trigger Condition* ¹
		Data List > Data Setting Dialog Box > Type: Device Address	Device Address
			Use Reference Device Address
			Variable
	Data List > Data Setting Dialog Box > Data Setting > Type: Registered Constant	Index Device Address	
Alarm Log Settings	General	Monitor How Many Times Each Alarm has occurred	
		Monitor the state of Each Alarm	
Data Log Settings > Individual Settings	Option	Copy Data Log Data	Destination Device Address
		Starting Point	Specify by Value of Device Address
		Number of data	Device Address
		Target Data	Start number, End number
Operation Log Settings	General	Trigger Conditions	Device Address
Preventive maintenance settings > Individual settings	Operation time	Measure Operation time	
		Report when Operating Time has reached or exceeded Threshold level	Level #: Threshold
			Report Device Address
	Number of operations	Measure Operation count	
		Report when Operation Count has reached or exceeded Threshold level	Level #: Threshold
			Report Device Address

*¹ With WindO/I-NV3, you were able to set the device address of the external device, but this is a bug in WindO/I-NV3.

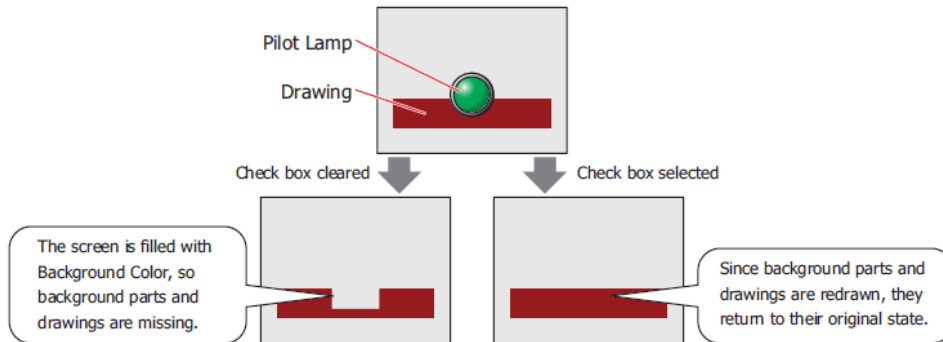
2.4 Parts

● Selector Switch, Potentiometer

The FT1J series does not support a selector switch and potentiometer. To reproduce a screen using a selector switch or potentiometer on the FT1J series, please use the "Selector Switch" or "Slider Switch" in the sample library of the parts library or combine other parts to create a part with similar functionality.

● Pilot Lamp, Multi-State Lamp, Picture Display

The FT1A Touch has a Pilot Lamp, Multi-State Lamp, and Picture Display with **Recover Background** checkbox. The behaviors of the display when **Recover Background** checkbox is selected and cleared are as follows:

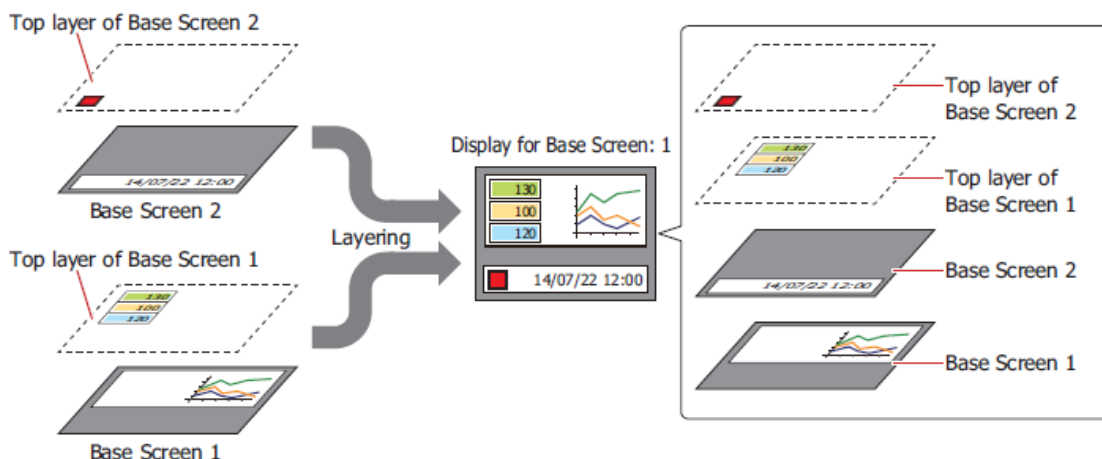


In the FT1J series, the background is always recovered to its original state (it is the same as if the check box was selected). If you have created screens with parts or drawings placed in the background by unchecking the **Recover Background** check box for parts in the project before the product series change, change the background settings as necessary.

2.5 Base screen overlay

● Rendering the top layer

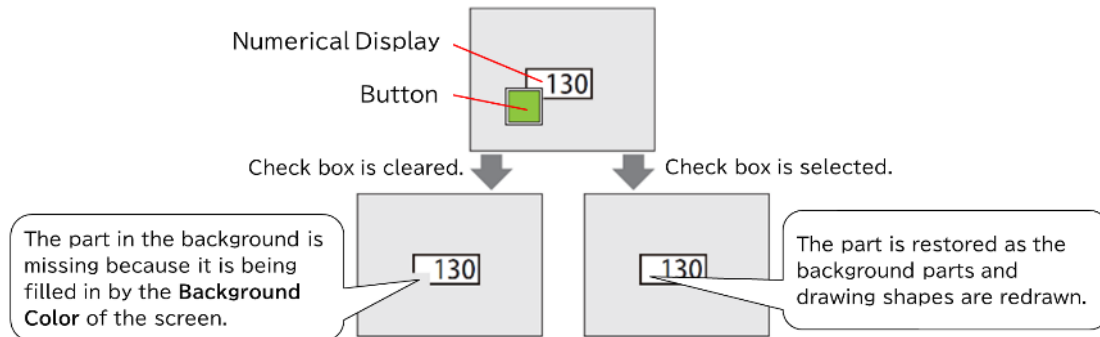
When changing to the FT1J series, objects that meet the conditions described in Chapter 7 "2 Rules for Converting to the top layer" are automatically placed on the top layer. Also, when overlaying screens are rendered, the objects on the top layer are drawn together later, as shown on the right side of the following illustration.



Therefore, if there is an object that is automatically placed on the top layer on a base screen with overlaying screens set, the display may differ from that of the FT1A Touch screen.

● Rendering of overlaying parts on different base screens

When parts are overlaid as a result of **Overlay with Base Screen**, the rendering process for the parts behind screens will be different when the part in front goes from visible to hidden. On the FT1A Touch, parts in the background are fully displayed. However, on the FT1J, if the **Place on the Top Layer** checkbox is cleared, overlapping background parts may be cut off by those in the foreground.



2.6 Installed Fonts in the Main Unit

The FT1A Touch comes with Japanese, Western, and High-quality Western fonts pre-installed, but any other fonts must be downloaded as extension fonts. With the FT1J series, all fonts are pre-installed at the time of shipment*¹, so there is no need to download them. Additionally, the fonts have been changed from bitmap fonts to outline fonts, so fonts maintain consistent quality when scaled up or down. To maintain this advantage, line spacing adjustment is added for accurately reproducing the display of multi-line text with bitmap fonts.

Other differences from the FT1A Touch are as follows:

- **Size** of the font is specified by points, not by magnification.
- The **Size** of "16x16" for numeric input, text input, numeric display, and clock is not supported.
- "Bold" and "Shadow" are not supported.

When changing product series, the font size and line spacing will be automatically adjusted to match the previous bitmap font size as much as possible. However, incompatible settings will be replaced with default values, so after changing the product series, please check that the text on each screen is adjusted appropriately and change the size and space between lines as necessary.

*¹ For the FT1J series, there is no **Use Large Font** check box on the **System** tab of the **Project Settings** dialog box of WindO/I-NV4.

2.7 Prohibited characters

● Tag Name

In WindO/I-NV4 Ver. 3.0.0 or later, tag names containing a colon cannot be set. Please set a tag name that does not contain a colon.

● File and folder name

The following characters cannot be used in file and folder names:

Item	FT1A Touch	FT1J series
File name	¥ / : ; * ? " < >	¥ / : ; * ? " < > # & \$ ' () ` ~ Two consecutive periods
Folder name	All symbols	¥ / : ; * ? " < > # & \$ ' () ` ~ .

The characters listed below cannot be used in the following file names, folder names, and commands.

Dialog Box	Tab	Setting Item Name	
Project Settings	External Memory Device	External Memory Device Folder	
Alarm Log Settings	External Memory Device	Batch	File name
		Real Time	File name
Data Log Settings	External Memory Device	Batch	File name
		Real Time	File name
Operation Log Settings	External Memory Device	Batch	File name
		Real Time	File name
Recipe Settings > Individual Settings	Block	Access to: External Memory Device	File name
Picture Manager		File name	
Key Button	Data Transfer	Download Project	Source
		Upload Project	Destination

file	section	Command	
USB autorun definition file (hgauto.ini)	[COMMAND]	command = PRO_DOWNLOAD	src_path* ¹
		command = PRO_UPLOAD	dst_path* ¹

2.8 Communication Driver

The FT1J does not support the following communication drivers:

After changing the product series, the **Manufacturer** on the **Communication Driver** tab of the **Project Settings** dialog box will change to "Not Use" and all related settings will return to their default settings.

Manufacturer	Communication Driver
Koyo	KOSTAC-SUSZ DirectLogic (Ethernet)
YOKOGAWA	FACTORY ACE FA-M3 (Ethernet)
Hitachi Industrial Equipment Systems	EH (Ethernet)

*1 You can use a colon (:) following the drive letter and a backslash (¥) as a path separator.

Chapter 6 Other specification differences

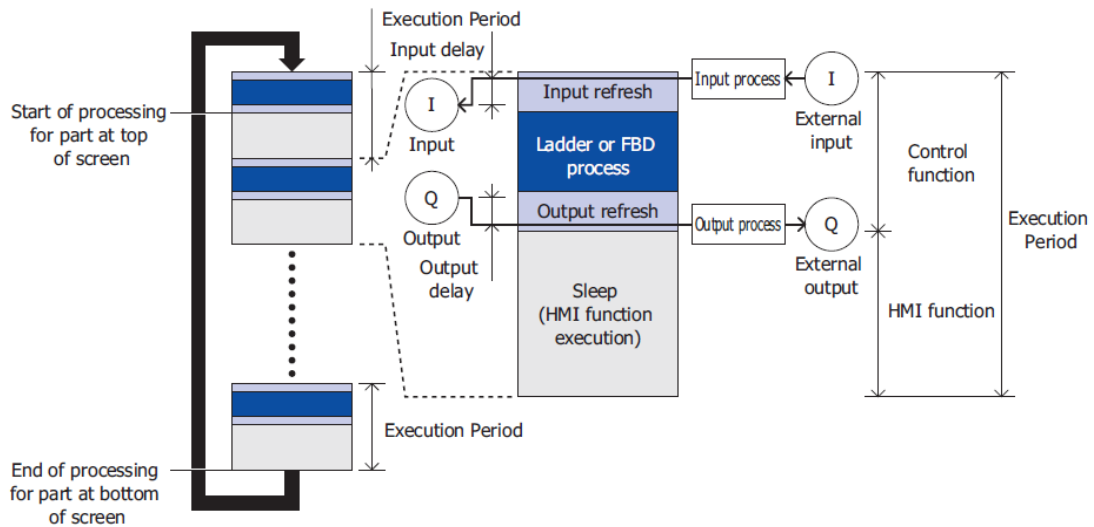
1 Main unit operation specifications

1.1 Control function operation

● FT1A Touch

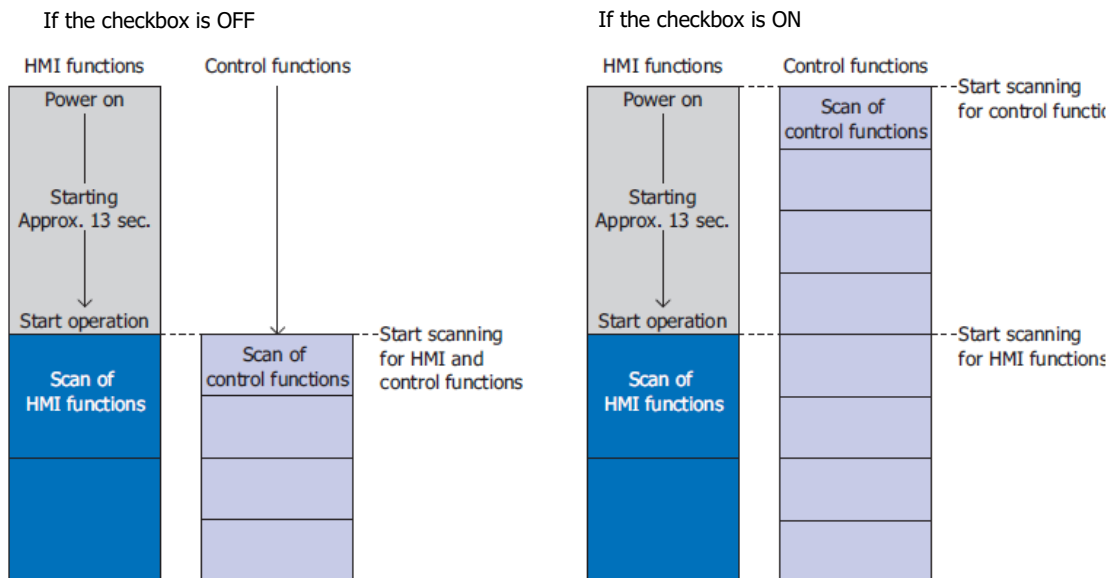
For each part on the screen, the control function is executed first, then the HMI function (display processing) is executed.

The control function (input refresh + ladder or FBD processing + output refresh) and HMI function (sleep) are executed in a single cycle, with the control function running at fixed intervals. This interval is set in the **Execution Period of Control Function** on the **System** tab of the WindO/I-NV3 **Project Settings** dialog box.



● FT1J series

The HMI function and the control function are processed independently.*1 If you want to start the control function without waiting for the HMI function to start, select the **Start running immediately when power on** check box.



*1 For the FT1J series, there is no **Execution Period of Control Function** setting on the **System** tab of the **Project Settings** dialog box of WindO/I-NV4.

1.2 Changing timer and counter settings

You can change the timer and Counter Preset Values by clicking the **Confirm** button in the **TIM/CNT Change Status** under **Operation Status** in the **PLC Status** dialog box of WindLDR.

However, while monitoring is in progress, you can click this button to change the values on the FT1A Touch, but you cannot change it on the FT1J series.*1

1.3 Resetting after switching to System Mode

When switching from run mode to system mode, the FT1A Touch does not reset the control functions, but the FT1J does.

Therefore, if a ladder program execution error occurs (the value of bit 13 of the Special Data Register (D8005) becomes 1), and you switch to system mode and then return to run mode, the value of bit 13 of D8005 will be retained (remains 1) on the FT1A Touch, but will become 0 on the FT1J.

1.4 Clear after download

● Log Data

FT1A Touch: Always clear.

FT1J series: You can select whether to retain or clear the data log, alarm log, operation log, and data storage area only if the settings have not been changed. To clear data, select the check box for the data you want to clear in **Clear the following data** in the **Download** dialog box.

● Ladder program execution error code (D8006) value

FT1A Touch: Retained.

FT1J series: Cleared.

*1 For the FT1J series, there is no check box for **Blink #TP/#CP on the Touch screen when the value in TP/CP is modified** on the **System** tab of the **Project Settings** dialog box of WindO/I-NV4.

2 WindO/I-NV3 and WindO/I-NV4

2.1 Ribbon > Configuration tab

● Project > Project Settings dialog box > Contents tab

WindO/I-NV3: Exists

WindO/I-NV4: None

After changing the series, the **Description** will be deleted. If necessary, use other settings such as **Comment** in the **Project Details** tab alternatively.

2.2 Ribbon > Online tab

● Upload

WindO/I-NV3: The main unit does not reset after executing **Project Data**.

WindO/I-NV4: The main unit resets after executing **Project Data**, then resumes operation.

● Clear

WindO/I-NV3: The value of the ladder program execution error code (D8006) will be retained even after executing **All** or **Data of all Device Addresses**.

WindO/I-NV4: After executing **All** or **Values of All Device Addresses**, the value of D8006 is cleared.

● Simultaneous monitoring with WindLDR

WindO/I-NV3: Configure the communication interfaces separately and start monitoring with WindLDR and WindO/I-NV3. (Example: USB for WindO/I-NV3, Ethernet for WindLDR)

WindO/I-NV4: Start monitoring with WindLDR, then start monitoring with WindO/I-NV4.

● Simulator

WindO/I-NV3: None

WindO/I-NV4: Exists (You can debug the HMI function settings on a PC even if you do not have the main unit.)

● Communication

WindO/I-NV3: Maintenance communication with O/I Link slave is possible via O/I Link master.

WindO/I-NV4: Maintenance communication with O/I Link slave cannot be performed via O/I Link master.

2.3 Protocol Manager

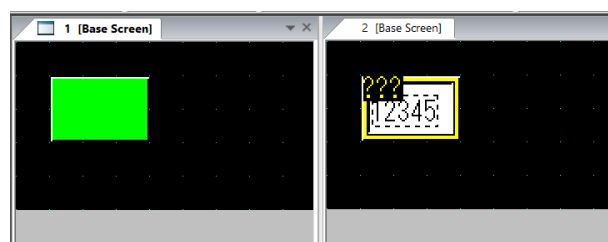
The number of default templates are different.

WindO/I-NV3: 4

WindO/I-NV4: 1

2.4 Screen window alignment

In WindO/I-NV3, screen windows can be displayed side-by-side, but in WindO/I-NV4, they cannot be displayed side-by-side.



2.5 Print Function

Print functions have been greatly improved in WindO/I-NV4. You can set the print contents for the cover, screen, and each setting within the project. It also supports Word document output.

2.6 Text Manager

The UI has been redesigned in WindO/I-NV4.

Even if the font is something other than "Windows", the text will be displayed in the selected font. Characters that are not supported by the selected font are displayed with a ? (question mark).

2.7 Library Screen

The library screen has been integrated into the part library.

WindO/I-NV3: Library screen

WindO/I-NV4: Part Library > **Custom**

2.8 Grouping of object lists

Objects look different when grouped.

WindO/I-NV3: The "Group Start" and "Group End" lines are displayed.

WindO/I-NV4: A collapse symbol and "Group" are displayed at the start position of the grouping.

2.9 Setting characters and device addresses

● Character

The UI for entering Unicode characters into the items that set the characters to be displayed on the screen is different.

WindO/I-NV3: Click the ">>" button and enter in the displayed **Unicode Input** dialog box.

WindO/I-NV4: Direct input (always Unicode input)

● Device Address

In the item for setting the device address, the dialog box that is displayed when clicking the ... button is different.

WindO/I-NV3: **Device Address Settings** dialog box

WindO/I-NV4: Tag Editor

2.10 Terms

The changed terms are as follows:

Item	WindO/I-NV3	WindO/I-NV4
Data types	BIN16(+)	UBIN16(W)
	BIN16(+/-)	BIN16(I)
	BIN32(+)	UBIN32(D)
	BIN32(+/-)	BIN32(L)
	float32	Float32(F)
	BCD4	BCD4(B)
	BCD8	BCD8(EB)
Ribbon > Online > Monitor	Simulation	Offline

2.11 Cartridge Settings

The UI for setting cartridges is different on WindLDR.

FT1A Touch: Cartridge in the **Function Area Settings** dialog box

FT1J series: Module configuration editor

2.12 System software version number

The UI for checking the system software version number is different.

FT1A Touch: Click **Status** in **PLC** on the **Online** tab of the WindLDR ribbon. Then check the displayed **PLC Status** dialog box.

FT1J series: Click **Target Info.** under **MICRO/I** on the **Online** tab of the ribbon in WindO/I-NV4. Then check the displayed **Target Information** dialog box.

2.13 Internal Clock

The method for changing the date and time data of the internal clock is different.

FT1A Touch: Click **Status** in **PLC** on the **Online** tab of the WindLDR ribbon. Then check the displayed **PLC Status** dialog box and click the **change...** button*¹ within **Operation Status, Calender**. Another way is by using Special Data Register D8015 to D8021, or HMI Special Data Register LSD20 to LSD26.

FT1J series: HMI Special Data Register LSD20 to LSD26 only

3 Downloader and Data File Manager

The compatible maintenance software is different.

FT1A Touch: Downloader

FT1J series: Data File Manager

*¹ Only valid when monitoring FT1A Touch

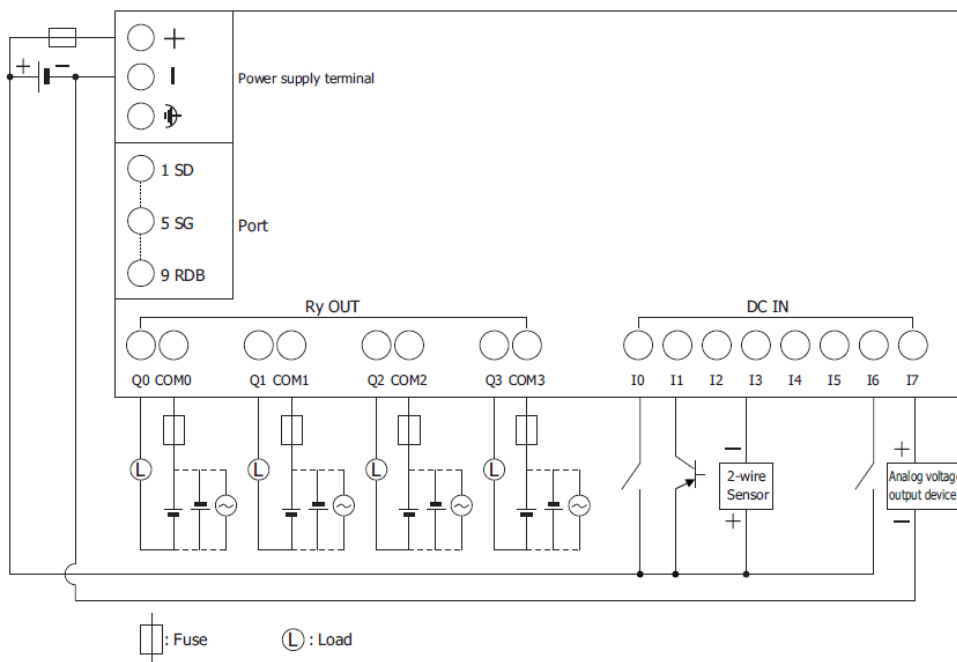
Chapter 7 References

1 Terminal arrangement and wiring example

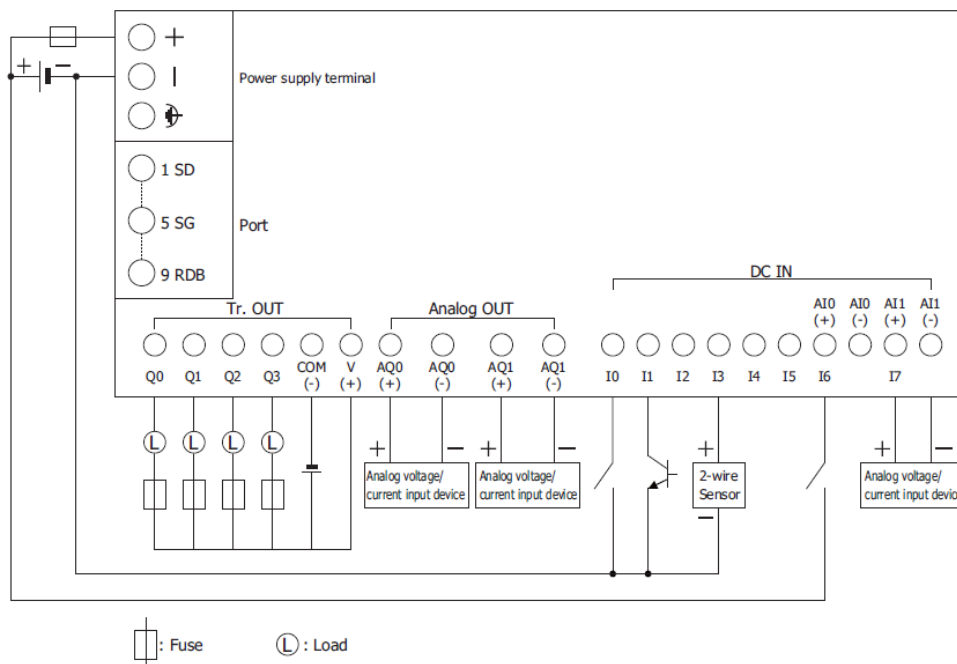
For details about the terminal arrangement and wiring, refer to the Hardware Manual in "Related Documents"

1.1 FT1A Touch

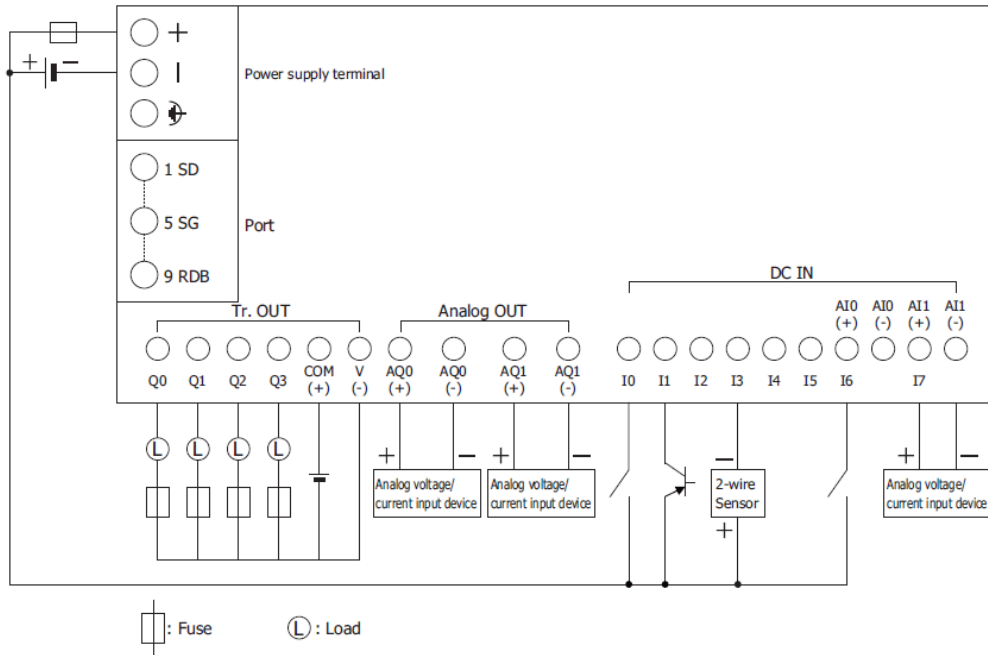
● FT1A-*12RA-*



● FT1A-*14KA-*

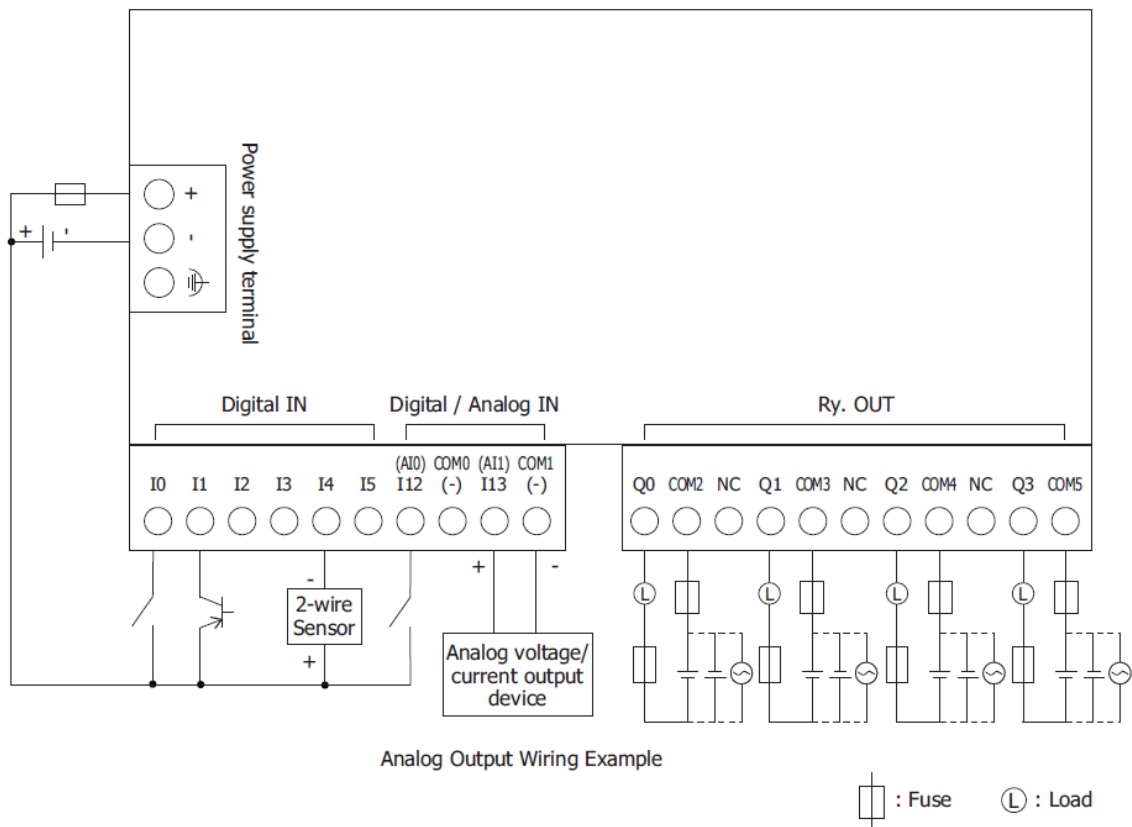


● **FT1A-*14SA-***

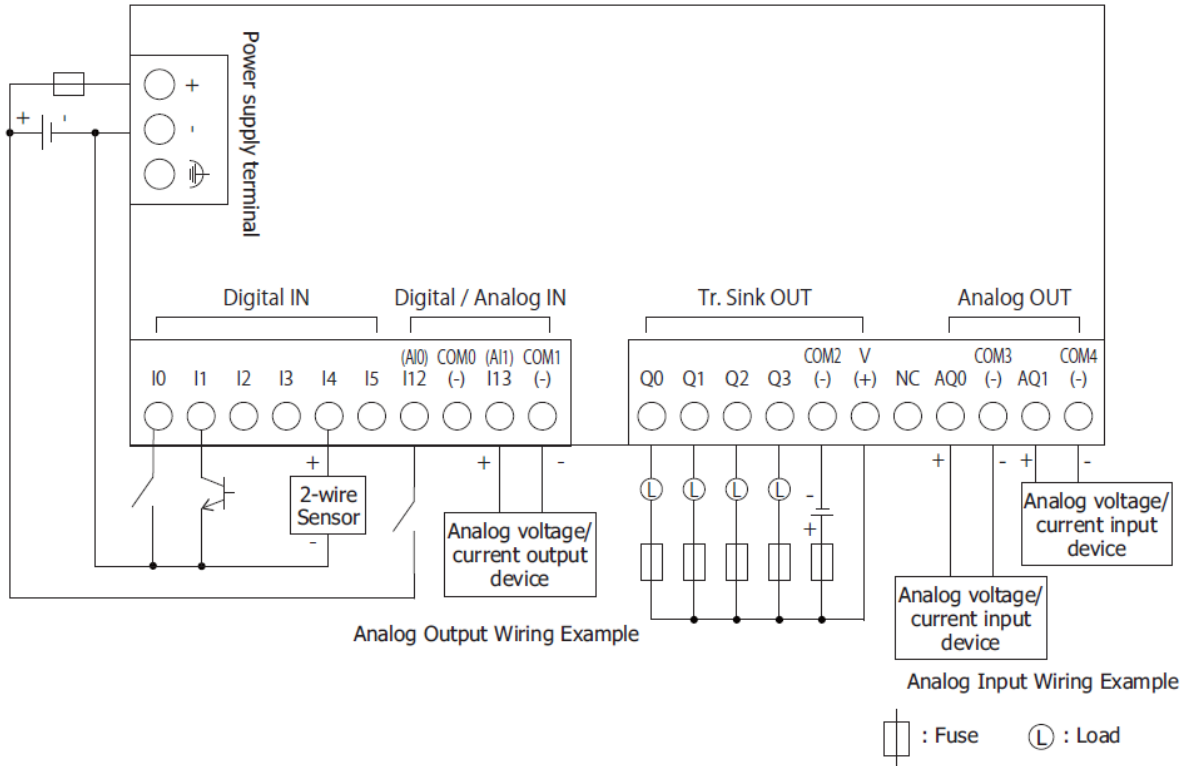


1.2 FT1J series

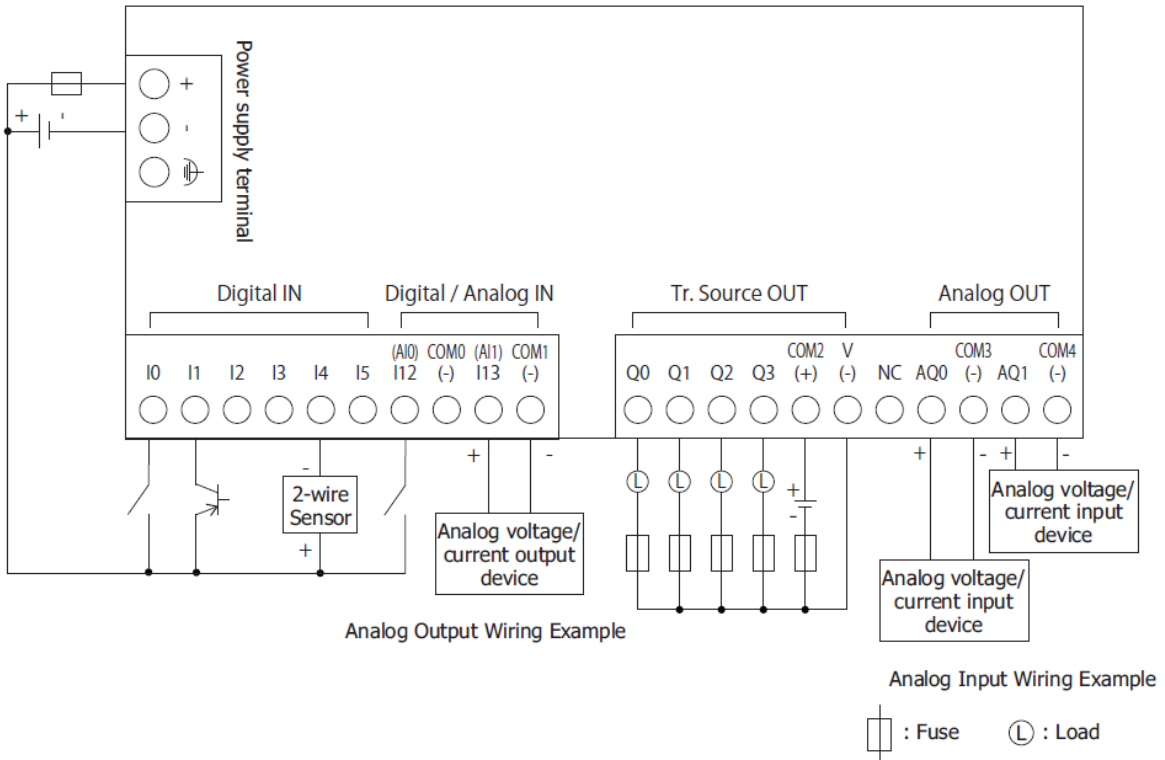
● **FT1J-4F12RAG-***



● **FT1J-4F14KAG-***



● **FT1J-4F14SAG-***



2 Rules for Converting to the top layer

Among overlaying objects, objects that meet certain conditions will be placed in the top layer after changing product series. However, this only applies to objects that are overlaying on the same screen; objects that are overlaying due to overlaying screens will not be included even if they meet the conditions. The conditions for conversion vary depending on the object.

● Drawings

Line, Polyline, Polygon, Rectangle, Circle/Ellipse, arc, Pie, Equilateral Polygons

Condition: **Flash** check box is selected

● Parts

All parts

If all of the following conditions are met:

Condition 1: Another part (part B) is placed within the rectangular area of this part (part A).

Condition 2: Part B operates before part A (it is at the top of the object list).

Condition 3: Part B is placed on the top layer

Pilot Lamp

If all of the following conditions are met:

Condition 1: The **Recover background** check box on the **View** tab is selected.

Condition 2: Another drawing or part (object B) is placed within the rectangular area of this part (part A).

Condition 3: Object B operates before part A (it is at the top of the object list).

Condition 4: One or more of the following are satisfied:

- "Flash(ON + Flash)" is set
- A shape that includes a transparent color is set for "Picture" in the **View** tab
- The **Not Display Image** check box is selected in the **View** tab

Multi-State Lamp

If all of the following conditions are met:

Condition 1: The **Recover background** check box on the **View** tab is selected.

Condition 2: Another drawing or part (object B) is placed within the rectangular area of this part (part A).

Condition 3: Object B operates before part A (it is at the top of the object list).

Condition 4: One or more of the following are satisfied:

- Select "Picture" in the **View** tab, and a shape containing a transparent color is set in the State Setting dialog box opened from the State tab
- The OFF state is set to None

Picture Display

If all of the following conditions are met:

Condition 1: The **Recover background** check box on the **View** tab is selected.

Condition 2: Another drawing or part (object B) is placed within the rectangular area of this part (part A).

Condition 3: Object B operates before part A (at the top of the object list).

Condition 4: One or more of the following are satisfied:

- The **Flash** check box is selected on the **General** tab
- The **Dynamic Position** check box is selected on the **General** tab
- A shape that contains a transparent color is set on the **View** tab

Condition 5: The **Dynamic Size** check box is unchecked on the **General** tab.

IDEC CORPORATION

Head Office 6-64, Nishi-Miyahara-2-Chome, Yodogawa-ku, Osaka 532-0004, Japan

 www.idec.com

USA	IDEC Corporation	Singapore	IDEC Izumi Asia Pte. Ltd.	China	IDEC (Shanghai) Corporation	Japan	IDEC Corporation
EMEA	APEM SAS	Thailand	IDEC Asia (Thailand) Co., Ltd.		IDEC Izumi (H.K.) Co., Ltd.		
		India	IDEC Controls India Private Ltd.	Taiwan	IDEC Taiwan Corporation		

Specifications and other descriptions in this document are subject to change without notice.
Information in this document is current as of October, 2024.
2024 IDEC Corporation, All Rights Reserved.

24-R&D-0417

