

Installation Guide

Model FX1002/FX1004/FX1006 /FX1008/FX1010/FX1012 FX1000 Paperless Recorder Safety Precautions and Installation Guide

IM 04L21B01-03EN

YOKOGAWA

Yokogawa Electric Corporation

10th Edition : Aug. 2023

Introduction

Thank you for purchasing the FX1002, FX1004, FX1006, FX1008, FX1010, or FX1012 Paperless Recorder (hereafter referred to as "FX" or "FX1000"). This manual describes the safety precautions and installation and wiring procedures of the FX1000. To ensure correct use, please read this manual and the manuals below thoroughly before beginning operation. For the product specifications, see the general specifications.

Manual Title	Manual No.
Model FX1002/FX1004/FX1006/FX1008/FX1010/FX1012 FX1000 Paperless Recorder Safety Precautions and Installation Guide Installing the FXA120 DAQSTANDARD FX1000 Mode Transition Diagram Setting Mode / Basic Setting Mode Maps (This manual)	IM 04L21B01-03EN

Electronic Manuals
You can download these manuals from the following web page. You will need Adobe Reader 7 or later (latest version recommended) by Adobe Systems.
<http://www.yokogawa.com/ns/fx1000/im/>

Manual Title	Manual No.
Model FX1002/FX1004/FX1006/FX1008/FX1010/FX1012 FX1000 Paperless Recorder User's Manual	IM 04L21B01-01EN
Model FX1002/FX1004/FX1006/FX1008/FX1010/FX1012 FX1000 Paperless Recorder First Step Guide	IM 04L21B01-02EN
Model FX1002/FX1004/FX1006/FX1008/FX1010/FX1012 FX1000 Paperless Recorder Safety Precautions and Installation Guide Installing the FXA120 DAQSTANDARD FX1000 Mode Transition Diagram Setting Mode / Basic Setting Mode Maps	IM 04L21B01-03EN
Model FX1002/FX1004/FX1006/FX1008/FX1010/FX1012 FX1000 Paperless Recorder Communication Interface (/C2, /C3, and /C7)	IM 04L21B01-17EN
FXA120 DAQSTANDARD for FX1000 Data Viewer	IM 04L21B01-63EN
FXA120 DAQSTANDARD for FX1000 Hardware Configurator	IM 04L21B01-64EN
Model FX1002/FX1004/FX1006/FX1008/FX1010/FX1012 FX1000 Paperless Recorder Usage Precautions	IM 04L21B01-91EN

General Specifications Name	General Specifications No.
Model FX1002/FX1004/FX1006/FX1008/FX1010/FX1012 FX1000 Paperless Recorder	GS 04L21B0-02EN

* The last two characters of the manual number and the general specifications number indicate the language in which the manuals or general specifications are written.

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MD5
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FX1002, FX1004, FX1006, FX1008, FX1010, FX1012

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Authorised Representative in the EEA and the Importer into the EU/EEA Market

The Authorised Representative for this product in the EEA and the importer for this product into the EU/EEA market via Yokogawa sale channel is:
Yokogawa Europe B.V.

Euroweg 2, 3825 HD Amersfoort, The Netherlands

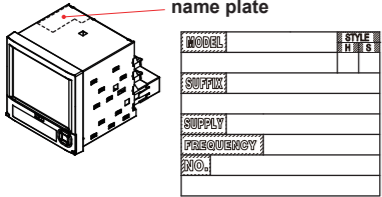
Importer for This Product into the Great Britain Market

In relation to UKCA marking, the importer for this product into the Great Britain market via the YOKOGAWA sales channel is :

Yokogawa United Kingdom Limited
Stuart Road Manor Park Runcorn, WA7 1TR, United Kingdom

Model and Suffix Codes

A name plate is located on the top panel of the FX. Check that the model name and suffix code given on the name plate match those on your order.



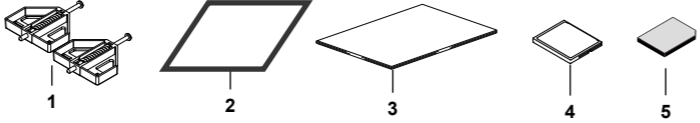
Model code	Suffix code	Optional code	Description
FX1002			2ch, Shortest measurement interval:125ms
FX1004			4ch, Shortest measurement interval:125ms
FX1006			6ch, Shortest measurement interval:1s
FX1008			8ch, Shortest measurement interval:1s
FX1010			10ch, Shortest measurement interval:1s
FX1012			12ch, Shortest measurement interval:1s
External storage medium slot	-0		Without CF card slot/SD card slot and medium ^(Note)
	-4		With CF card slot and medium
	-7		With SD card slot and medium
Language	-2		English/German/French/Italian/ Spanish/ Portuguese/ Russian/ Korean deg F and DST
Withstanding voltage between measuring input terminals	-H		1000 VAC(50/60 Hz), 1 min
	-L		400 VAC(50/60 Hz), 1 min
Options		/A1	Alarm output 2 points (C-contact) ^{*1*10}
		/A2	Alarm output 4 points (C-contact) ^{*1}
		/A3	Alarm output 6 points (C-contact) ^{*1*3}
		/A4A	Alarm output 12 points (A-contact) ^{*1*3}
		/C2	RS-232 interface ^{*2}
		/C3	RS-422A/485 interface ^{*2}
		/C7	Ethernet interface
		/F1	FAIL/Status output ^{*3}
		/M1	Mathematical functions (including Report functions)
		/N2	3 leg isolated RTD ^{*4}
		/N3F	Extended input type (without Pt1000)
		/P1	24 VDC/AC power supply
		/R1	Remote control 8 points ^{*5}
		/TPS2	24VDC transmitter power supply (2 loops) ^{*6*10}
		/TPS4	24VDC transmitter power supply (4 loops) ^{*7}
		/USB1	USB interface (1 port)
		/PM1	Pulse input 3 points, Remote control 5 points (including Mathematical functions) ^{*8}
		/CC1	Calibration correction function
		/LG1	Log scale
		/PWR1	Power monitor (1 A input, including Mathematical functions) ^{*9*10}
		/PWR5	Power monitor (5 A input, including Mathematical functions) ^{*10*11}
		/S#	Customized product; details in IM FX1K-S#E ^{*12}

Note: To load data, the FX must be equipped with a communication interface (/C2, /C3 or /C7 option) or the USB interface (/USB1 option.)

- *1 Any combination of /A1, /A2, /A3, and /A4A cannot be specified together.
- *2 /C2 and /C3 cannot be specified together.
- *3 /A3 or /A4A cannot be specified together with /F1.
- *4 /N2 cannot be specified for FX1002 or FX1004.
- *5 If /R1 is specified, /A4A, /TPS2, /TPS4, /PM1, /PWR1, or /PWR5 cannot be specified.
- *6 If /TPS2 is specified, /TPS4, /A2, /A3, /A4A, /F1, /R1, or /PM1 cannot be specified.
- *7 If /TPS4 is specified, /TPS2, /A1, /A2, /A3, /A4A, /F1, /R1, or /PM1 cannot be specified.
- *8 If /PM1 is specified, /A4A, /M1, /R1, /TPS2, /TPS4, /PWR1, or /PWR5 cannot be specified.
- *9 If /PWR1 is specified, /A3, /A4A, /F1, /R1, /PM1, /M1, or /PWR5 cannot be specified.
- *10/TPS2, /PWR1, and /A1 cannot be specified together. /TPS2, /PWR5, and /A1 cannot be specified together.
- *11 If /PWR5 is specified, /A3, /A4A, /F1, /R1, /PM1, /M1, or /PWR1 cannot be specified.
- *12Contact your supplier in case your instrument has option /S# (where '#' is a number), and you are not in the possession of IM FX1K-S#E.

Standard Accessories

The standard accessories below are supplied with the instrument. Check that all contents are present and undamaged.



No.	Name	Model	Qty.	Notes
1	Mounting brackets	B8730BU	2	For panel mounting
2	Rubber packing for dust and water protection	-	1	For single-unit mounting
3	Model FX1002/FX1004/FX1006/FX1008/FX1010/FX1012 FX1000 Paperless Recorder Safety Precautions and Installation Guide Installing the FXA120 DAQSTANDARD FX1000 Mode Transition Diagram Setting Mode / Basic Setting Mode Maps	IM 04L21B01-03EN	1	A3 size
4	CF card ^{*1}	772093	1	512 MB
5	SD card ^{*2}	773001	1	1 GB

- *1 On FXs that have a CF card slot (suffix code -4.)
CF card capacity is subject to change.
- *2 On FXs that have a SD card slot (suffix code -7.)
SD card capacity is subject to change.
- *3 For optional accessories (Sold Separately), see the IM 04L21B01-02EN.

Software (FXA120 DAQSTANDARD for FX1000), Label

Please download the software and the label data from the following web page.
<http://www.yokogawa.com/ns/fx1000/soft/>

Item	Description
Software	FXA120 DAQSTANDARD for FX1000 Consists of the Data Viewer and the Hardware Configurator.
Label	Labels to Attach to the FX1000 Operation Cover Download the label data (Excel file). Print the label that you want to use. Label size: 19 ± 0.3 mm tall and 90 ± 0.3 mm wide File name: IM04L21B01-81Z1.xls

1. Safety Precautions

The following safety symbols are used on the product and in this manual.



Calls attention to actions or conditions that could cause serious or fatal injury to the user, and indicates precautions that should be taken to prevent such occurrences.



Calls attention to actions or conditions that could cause injury to the user or damage to the instrument or property and indicates precautions that should be taken to prevent such occurrences.



"Handle with care." To avoid injury and damage to the instrument, the operator must refer to the explanation in the manual.

Protective ground terminal



Alternating current



Direct current

Note

Identifies important information required to operate the instrument.

Safety Precautions

- This instrument conforms to IEC safety class I (provided with terminal for protective grounding), Overvoltage Category II or I, Pollution Degree 2, and Measurement Category II (CAT II).
- This instrument is an EN 61326-1 (EMC standard) class A instrument (for use in commercial, industrial, or business environments). The influence rate (judgment condition A) in the immunity test environment is within ±15 % of the range or ±10 mV.
- The general safety precautions described here must be observed during all phases of operation. If the FX is used in a manner not described in this manual, the FX safety features may be impaired. Yokogawa Electric Corporation assumes no liability for the customer's failure to comply with these requirements.
- The FX is designed for indoor use.
- Supported Standards

CSA:	CAN/CSA-C22.2 No. 61010-1, CAN/CSA-C22.2 No. 61010-2-030, Overvoltage Category II or I ¹ , Pollution Degree 2 ² , Measurement Category II ³
UL:	UL 61010-1, UL 61010-2-030 (CSANRTL/C), Overvoltage Category II or I ¹ , Pollution Degree 2 ² , Measurement Category II ³
CE, UKCA:	EMC directive: EN 61326-1 Class A, Table 2 (For use in industrial locations) compliant, EN IEC 61000-3-2 compliant, EN 61000-3-3 compliant, EN 55011 Class A, Group 1 compliant Low voltage directive: EN 61010-1, EN IEC 61010-2-030, Overvoltage Category II or I ¹ , Pollution Degree 2 ² , Measurement Category II ³ EU RoHS directive: EN IEC 63000 compliant WEEE directive: Compliant EMC Regulatory Arrangement in Australia and New Zealand (RCM): EN 55011 Class A, Group 1 compliant
KC marking:	KS C9811, KS C9610-6-2 compliant

- *1: Overvoltage Category : Describes a number which defines a transient overvoltage condition. Implies the regulation for impulse withstand voltage. "II" applies to electrical equipment which is supplied from the fixed installation like a distribution board.
II: Applied to standard power supply (100-240 VAC)
I: Applied to /P1 option (24 VAC/DC)
- *2: Pollution Degree 2: Describes the degree to which a solid, liquid, or gas which deteriorates dielectric strength or surface resistivity is adhering. "2" applies to normal indoor atmosphere. Normally, only non-conductive pollution occurs.
- *3: Measurement Category II: Applies to measuring circuits connected to low voltage installation, and electrical instruments supplied with power from fixed equipment such as electric switchboards.

About User's Manual

- Please pass user's manuals to the end user. We also ask you to store manuals in a safe place.
- Read user's manuals thoroughly and have a clear understanding of the product before operation.
- User's manuals explain the functions of the product. It does not guarantee that the product will suit a particular purpose of the user.
- This manual is part of this product. Keep this manual on safe place for future reference.

Handling Precautions of the FX

Use care when cleaning this instrument, especially its plastic parts. Use a soft dry cloth. Do not use organic solvents, such as benzene or thinner, or other cleansers. They may cause discoloring and deformation.

Precautions Related to the Protection, Safety, and Alteration of the Product

- For the protection and safe use of the product and the system in which this product is incorporated, be sure to follow the instructions and precautions on safety that are stated in this manual whenever you handle the product. Take special note that if you handle the product in a manner that violates these instructions, the protection functionality of the product may be damaged or impaired. In such cases, YOKOGAWA does not guarantee the quality, performance, function, and safety of product.
- When installing protection and/or safety circuits such as lightning protection devices and equipment for the product and control system or designing or installing separate protection and/or safety circuits for fool-proof design and fail-safe design of the processes and lines that use the product and the control system, the user should implement these using additional devices and equipment.
- If you are replacing parts or consumable items of the product, make sure to use parts specified by YOKOGAWA.
- This product is not designed or manufactured to be used in critical applications that directly affect or threaten human lives. Such applications include nuclear power equipment, devices using radioactivity, railway facilities, aviation equipment, air navigation facilities, aviation facilities, and medical equipment. If so used, it is the user's responsibility to include in the system additional equipment and devices that ensure personnel safety.
- Do not modify this product.



- Use the Correct Power Supply**
Ensure that the source voltage matches the voltage of the power supply before turning ON the power.
- Connect the Protective Grounding Terminal**
Make sure to connect the protective grounding to prevent electric shock before turning ON the power.
- Do Not Impair the Protective Grounding**
Never cut off the internal or external protective grounding wire or disconnect the wiring of the protective grounding terminal. Doing so invalidates the protective functions of the instrument and poses a potential shock hazard.
- Do Not Operate with Defective Protective Grounding**
Do not operate the instrument if the protective grounding might be defective. Also, make sure to check them before operation.
- Do Not Operate in an Explosive Atmosphere**
Do not operate the instrument in the presence of flammable liquids or vapors. Operation in such an environment constitutes a safety hazard. Prolonged use in a highly dense corrosive gas (H₂S, SO_x, etc.) will cause a malfunction.
- Do Not Remove Covers**
The cover should be removed by YOKOGAWA's qualified personnel only. Opening the cover is dangerous, because some areas inside the instrument have high voltages.
- Ground the Instrument before Making External Connections**
Connect the protective grounding before connecting to the item under measurement or control unit.
- Damage to the Protection**
Operating the instrument in a manner not described in this manual may damage the instrument's protection.



This instrument is a Class A product. Operation of this instrument in a residential area may cause radio interference, in which case the user is required to take appropriate measures to correct the interference.

Exemption from Responsibility

- YOKOGAWA makes no warranties regarding the product except those stated in the WARRANTY that is provided separately.
- YOKOGAWA assumes no liability to any party for any loss or damage, direct or indirect, caused by the user or any unpredictable defect of the product.

2. Installation

Installation Location

Install the FX indoors in an environment that meets the following conditions:

- Instrumentation Panel**
The FX is designed to be installed in an instrumentation panel.
- Well-Ventilated Location**
To prevent overheating, install the FX in a well-ventilated location. For the panel cut dimensions when arranging multiple FXs, see "External Dimensions and Panel Cutout Dimensions." When other instruments are installed next to the FX, follow the panel cut dimensions to provide adequate space around the FX.
- Minimal Mechanical Vibrations**
Install the FX in a location that has minimal mechanical vibrations. Installing the FX in a location that is subject to large levels of mechanical vibration will not only put added stress on its components, it may also impede ordinary measurement.

- **Level Location**
Install the FX in a level location so that it is not slanted to the left or the right (however, the FX can be inclined up to 30 degrees backward for panel mounting).
- **Ambient temperature range between 0 to 50°C**
- **Ambient humidity between 20 to 80%RH (However, less than moisture content of 40°C 80% RH at 40°C or more), No condensation should be present.**
- **Altitude 2000 m or less**

Note

Condensation may form when moving the FX from an environment whose temperature or humidity is low to an environment whose temperature or humidity is high, or when there is a sudden change in temperature. Temperature or humidity changes may also result in thermocouple measurement errors. In these kinds of circumstances, let the FX adjust to the new environment for at least an hour before using it.

Do not install the FX in the following places.

- **Outdoors**
- **In Direct Sunlight or Near Heat Sources**
Install the FX in a place that is near room temperature (23°C) and that is not subject to large temperature fluctuations. Placing the FX in direct sunlight or near heat sources can cause adverse effects on the internal circuitry.
- **Where an Excessive Amount of Soot, Steam, Moisture, Dust, or Corrosive Gases Are Present**
Soot, steam, moisture, dust, and corrosive gases will adversely affect the FX. Avoid installing the FX in such locations.
- **Near Strong Magnetic Field Sources**
Do not bring magnets or instruments that produce electromagnetic fields close to the FX. Operating the FX near strong magnetic fields can cause measurement errors.
- **Where the Display Is Difficult to See**
The FX uses an LCD screen, so it is difficult to view the display from an extreme angle. Install the FX so that the user can view the display directly from the front.

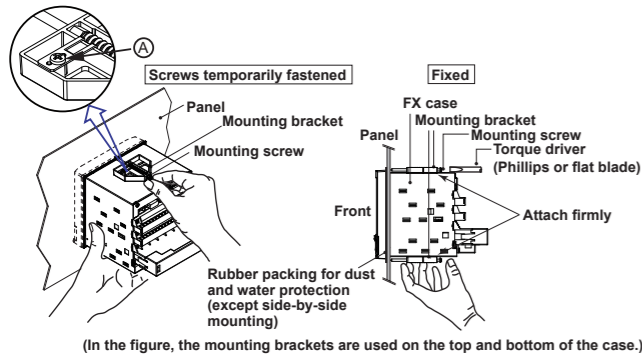
■ Installation Procedure

Use a steel panel that is 2 mm to 26 mm thick.

- 1) Insert the FX through the front of the panel.
 - 2) Mount the FX to the panel using the included mounting brackets as shown in the figure below.
- Use two mounting brackets to support the top and bottom or the left and right sides of the case (remove the stickers that are covering the holes before you attach the brackets).
 - Follow the procedure below to mount the FX to the panel.
 - First, attach the two mounting brackets and temporarily tighten the mounting screws.
 - Next, fix the FX in place by tightening the mounting screws with the appropriate torque.
- When the FX is approximately perpendicular to the panel, press the mounting brackets so that they are in contact with the case, and fully tighten the mounting screws.
- Tighten the mounting bracket screws until you hear clicks.



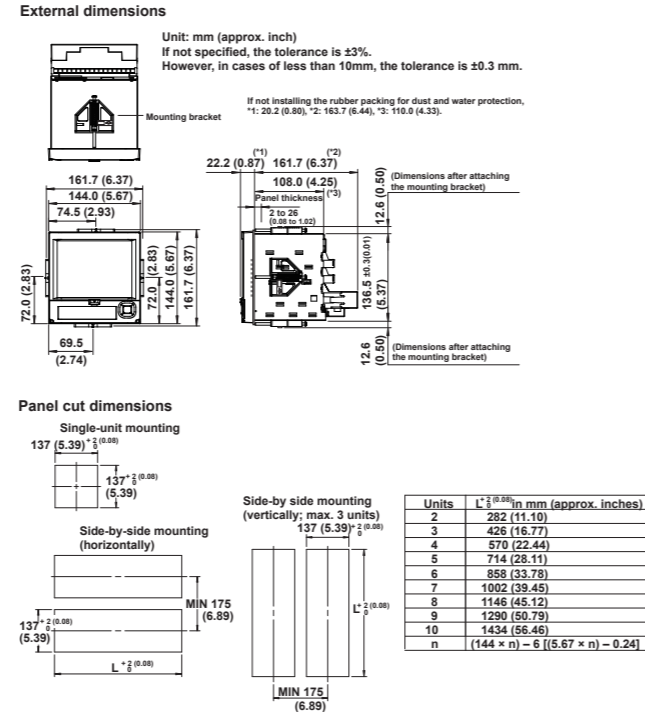
- Using more than the appropriate torque to tighten the screws can deform the case or damage the brackets.
- Be sure not to insert foreign objects or tools into the case through the mounting bracket holes.
- Do not touch the screw at the top of the mounting bracket (A). Loosening or tightening this screw may cause the FX to malfunction.



Note

To achieve sufficient dust proofing and waterproofing, mount the FX in the middle of the panel cut out. However, do not use the rubber packing if you are mounting two instruments side by side or one on top of the other.

■ External Dimensions and Panel Cutout Dimensions



3. Wiring

■ Input Signal Wiring



To prevent electric shock while wiring, make sure that the power supply is turned off.



- Applying a strong tension to the input and output signal cables connected to the FX may damage the cables or the FX terminals. To avoid applying tension directly to the terminals, fix all cables to the rear of the mounting panel.
- To prevent fire, use signal cables with a temperature rating of 80°C or more.
- Do not apply voltages that exceed the following values to the input terminals. Doing so may damage the FX.
 - Maximum input voltage: ±60 VDC
 - Maximum common mode voltage: ±60 VDC (under measurement category II conditions)

Precautions to Be Taken While Wiring

- Take the following precautions when wiring the input signal cables.
- When using a screw terminal, we recommend that you use a crimp-on lug with an insulation sleeve (designed for 3 mm screws).
- Take measures to prevent noise from entering the measurement circuit.
- Move the measurement circuit away from the power cable (power circuit) and ground circuit.
 - Ideally, the object being measured should not generate noise. However, if this is unavoidable, isolate the measurement circuit from the object. Also, ground the object being measured.
 - Shielded wires should be used to minimize the noise caused by electrostatic induction. Connect the shield to the ground terminal of the FX as necessary (make sure you are not grounding at two points).
 - To minimize noise caused by electromagnetic induction, twist the measurement circuit wires at short, equal intervals.
 - Make sure to earth ground the protective ground terminal through minimum resistance.

Do not allow static electricity to be applied to the terminals.

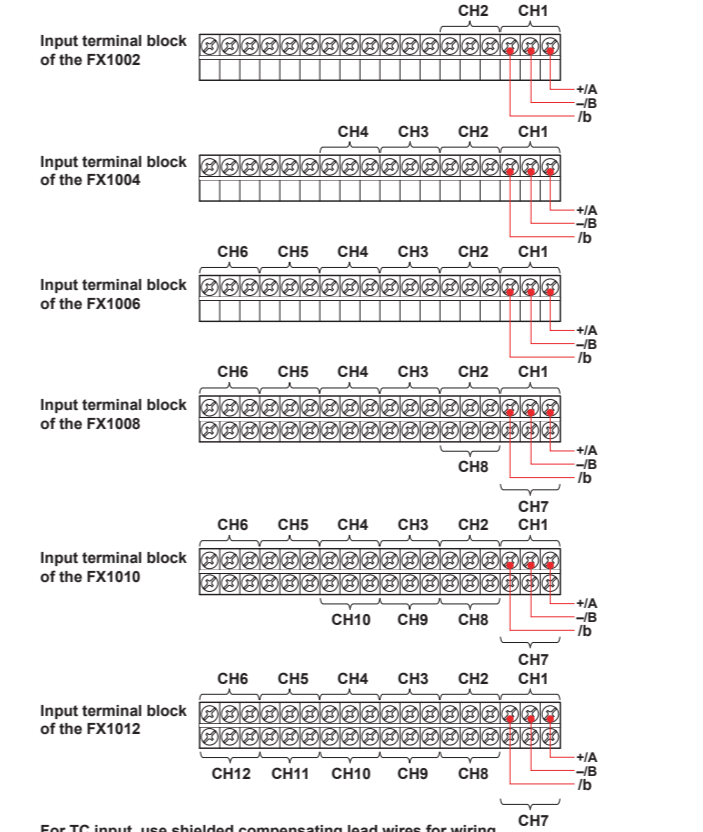
- When wiring the terminals, remove static electricity so that static electricity is not applied.
- If static electricity or similar high-voltage transient noise is applied to the signal line, the system may break.

When using internal reference junction compensation on the thermocouple input, take measures to stabilize the temperature at the input terminal.

- Always use the terminal cover.
- Do not use thick wires which may cause large heat dissipation (we recommend a cross sectional area of 0.5 mm² or less).
- Make sure that the ambient temperature remains reasonably stable. Large temperature fluctuations can occur if a nearby fan turns on or off.

Connecting the input wires in parallel with other devices can cause signal degradation, affecting all connected devices. If you need to make a parallel connection, then

- Turn the burnout detection function off.
- Ground the instruments to the same point.
- Do not turn other instruments on or off during operation. This can have adverse effects on the other instruments.
- RTDs cannot be wired in parallel.



For TC input, use shielded compensating lead wires for wiring.
For RTD input, lead wire resistance per wire of 10 Ω or less. Make the resistances of the three wires equal.
For DCA input, example: for 4 to 20 mA input, use a shunt resistor of 250 Ω ± 0.1%.

Note

RTD input terminals A and B are isolated on each channel. Terminal b is shorted internally across all channels. However, terminal b is also isolated on each channel on models with the /N2 option (3 leg isolated RTD).

■ Optional Terminal Wiring



- To prevent electric shock while wiring, make sure that the power supply is turned off.
- If a voltage of more than 30 VAC or 60 VDC is to be applied to the output terminals, use ring-tongue crimp-on lugs with insulation sleeves on all terminals to prevent the signal cables from slipping out when the screws become loose. Furthermore, use double-insulated cables (dielectric strength of 3000 VAC or more) for the signal cables on which a voltage of 30 VAC or 60 VDC or more is to be applied. For all other signal cables, use basic insulated cables (dielectric strength of 1500 VAC). To prevent electric shock, attach the terminal cover after wiring and make sure not to touch the terminals.

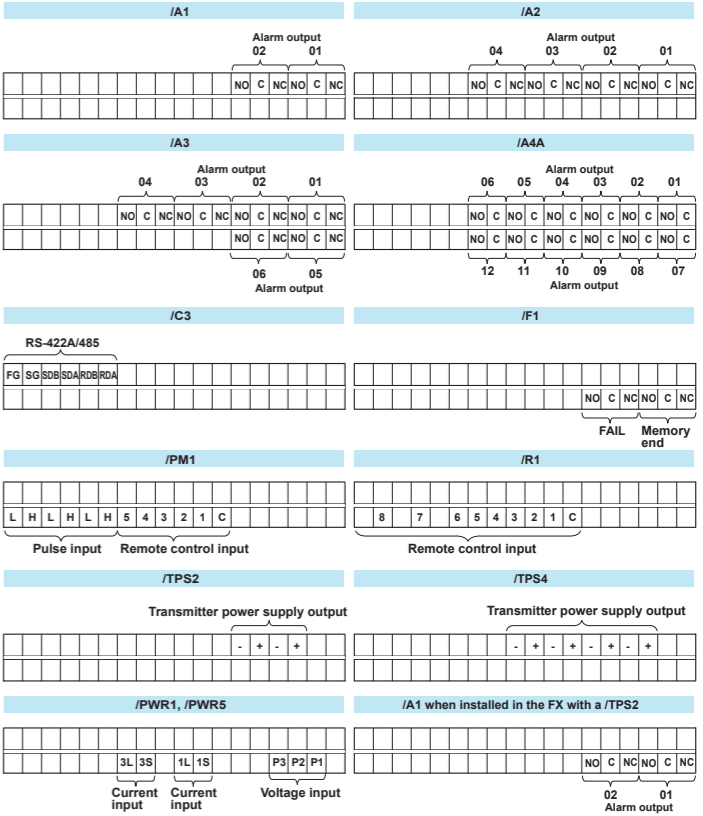


- Use the following circuit voltages for the connection to the alarm/FAIL/status output terminal.
 - When the connection is to Mains Circuits (primary power supply circuits): 150 V or less
 - When the connection is to circuits derived from Mains Circuits (secondary power supply circuits): 250 V or less (Keep the Mains Circuit voltage at 300 V or less, and use an isolation transformer.)
- To prevent fire, use signal cables for FX with a temperature rating of 70°C or more.
- Applying a strong tension to the input and output signal cables connected to the FX may damage the cables or the FX terminals. To avoid applying tension directly to the terminals, fix all cables to the rear of the mounting panel.
- Do not short the transmitter power supply output terminal or apply external voltage to it. Doing so may damage the instrument.
- When using the transmitter power supply output terminal, do not use current that is equal to or greater than the maximum output current (25 mADC). Doing so may damage the instrument.

Precautions to Be Taken While Wiring

We recommend that you use crimp-on lugs (designed for 3 mm screws) with insulation sleeves to connect to the optional terminals.

The following figures show the terminal positions for each option when only that option is installed. Even if you have installed a number of options, the individual terminal positions of the options do not change (except for the case where you have installed both the /TPS2 and /A1 options; in this case, the /A1 terminal positions are different).



• Alarm Output Terminal (/A1, /A2, and /A3), FAIL Output Terminal and Memory End Output Terminal (/F1)

Output format:	Relay contact
Contact rating:	250 VAC (50/60 Hz)/3 A, 250 VDC/0.1 A (load resistance)
Withstand voltage:	1600 VAC (50/60 Hz) for one minute (between output terminals and the ground terminal)

FAIL output (/F1)	Other output (/F1)
NO C NC During normal operation	NO C NC During normal operation
NO C NC When a failure occurs	NO C NC When the specified status occurs
NO C NC When power is turned off	NO C NC When power is turned off

• Alarm Output Terminal (/A4A)

Output format:	Relay contact
Contact rating:	250 VAC (50/60 Hz)/3 A, 250 VDC/0.1 A (load resistance)
Withstand voltage:	1600 VAC (50/60 Hz) for one minute (between output terminals and the ground terminal)

Alarm output
NO C During normal operation
NO C When the specified status occurs

• Remote Control Input Terminal (/R1)

Relay contact input (voltage-free contact)	Transistor input (open collector)
Contact open at 200 Ω or less Contact closed at 100 kΩ or greater	On voltage: 0.5 V or less (30 mADC) Leakage current when turned off: 0.25 mA or less

Internal circuit
5 V 1 to 8 C Input format: Photocoupler isolation Shared common (C) Allowable input voltage: 5 VDC

Withstand voltage: 1000 VDC for one minute between input terminals and the ground terminal

• Pulse Input Terminal (/PM1)

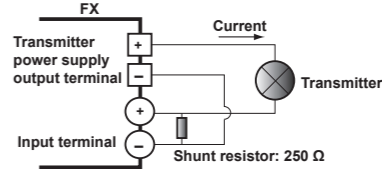
Relay contact input (voltage-free contact)	Transistor input (open collector)
Contact open at 200 Ω or less Contact closed at 100 kΩ or greater	On voltage: 0.5 V or less (30 mADC) Leakage current when turned off: 0.25 mA or less

Internal circuit
5 V H L Input format: Photocoupler isolation Shared common (L) Allowable input voltage: 30 VDC

Withstand voltage: 1000 VDC for one minute between input terminals and the ground terminal

• 24 VDC Transmitter Power Supply Output Terminal (/TPS2, /TPS4)

Connect the FX to the transmitter as shown below.

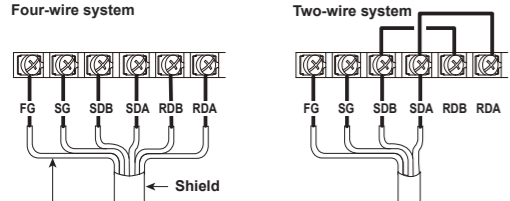


Note
To reduce noise, use a shielded cable for wiring. Connect the shield to the ground terminal of the FX.

• Serial Communication Interface (/C2)

9-pin D-sub RS-232 connector

• Serial Communication Interface (/C3)



Electric potential of the shield

- FG (Frame Ground) Case ground of the FX
- SG (Signal Ground) Signal ground
- SDB (Send Data B) Send data B (+)
- SDA (Send Data A) Send data A (-)
- RDB (Received Data B) Receive data B (+)
- RDA (Received Data A) Receive data A (-)

Recommended length of stripped wire: 9 mm.
Recommended tightening torque: 0.4 to 0.5 N·m

- Cable**
There are two types of cables available: the four-wire cable and the two-wire cable, which is used only for the Modbus protocol.
The cable must meet the following specifications.
- Type: Shielded twisted pair cable. 3 pairs, 24 AWG or more (four wire); 2 pairs, 24 AWG or more (two wires).
 - Characteristic impedance: 100Ω
 - Capacitance: 50 pF/m
 - Total cable length: Up to 1.2 km

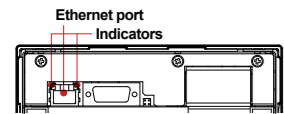
• Connecting to the USB Port (/USB1)

The USB port complies with USB revision 1.1. The USB port is installed on the FX's front panel.

• Connecting to the Ethernet Port (/C7)



Do not connect an Ethernet cable whose plug does not comply with FCC specifications. If you do, the FX may malfunction.

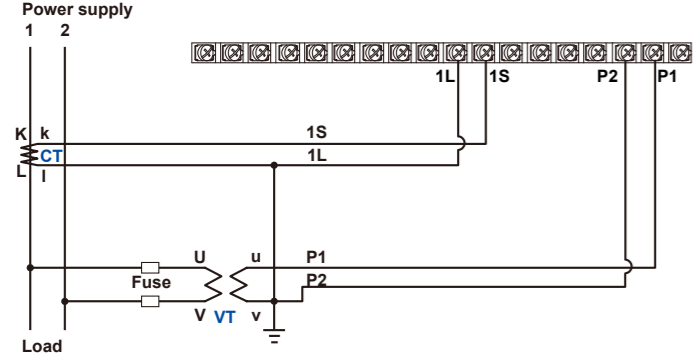


- Connecting to the Power Measurement Terminal (/PWR1, /PWR5)
Max. rated voltage: 300V, Max. rated current: 1 A (/PWR1) or 5 A (/PWR5), Measurement category: CAT II



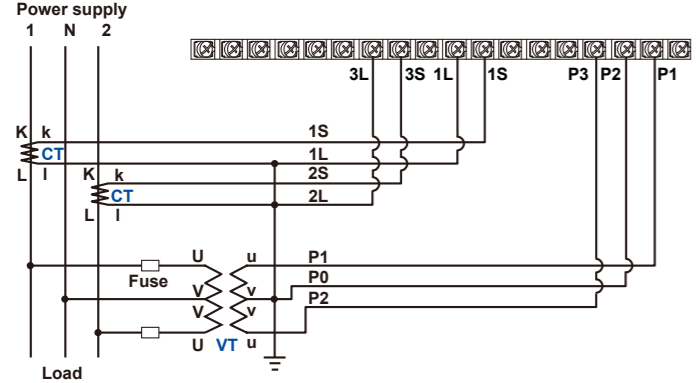
- If you are not using a VT and a CT, do not ground the input circuit.
- If you are wiring through conduits (metal tubes designed for wiring), install the CT (current transformer) inside a panel.
- Wire the voltage input and the current input within the same circuit.

Single-phase two-wire system

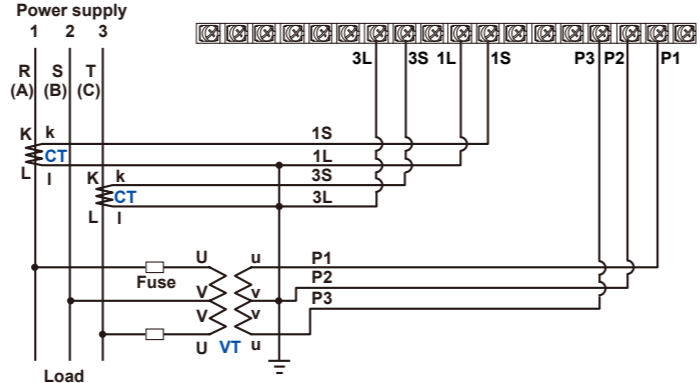


Single-phase three-wire system

For a single-phase three-wire system, connect wires to the terminal block as follows.



Three-phase three-wire system



■ Wiring the Power Supply

Make sure to follow the warnings below when wiring the power supply. Failure to do so may cause electric shock or damage to the instrument.

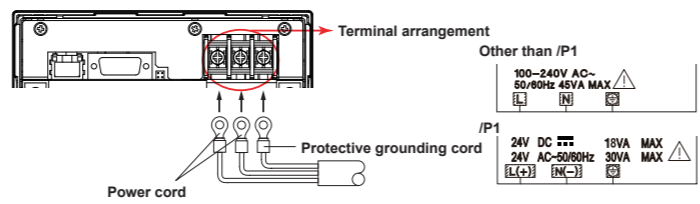


- To prevent electric shock, ensure that the power supply is turned off.
- To prevent fire, use 600 V PVC insulated wires (AWG20 to AWG16; temperature rating of 80°C or more) or wires or cables with equivalent or better performance.
- Make sure to earth ground the protective earth terminal through a minimum grounding resistance before turning ON the power.
- Use crimp-on lugs (designed for 4 mm screws) with insulation sleeves to connect both the power cord and the protective ground.
- To prevent electric shock, be sure to close the transparent cover for the power supply wires.
- For safety, provide a double-pole switch in an easily operable location near the FX to disconnect the FX from the main power supply. Use labels to indicate that this switch is for cutting off the power supply to the FX and to indicate ON and OFF. This switch must be suitably located and easily reached.

Switch specifications

Steady-state current rating: 1 A or more (other than /P1); 3 A or more (/P1)
Inrush current rating: 60 A or more (other than /P1); 70 A or more (/P1)
Use a switch that complies with IEC60947-1 and IEC60947-3.

- Connect a fuse (between 2 A and 15 A) to the power supply line.
- Do not add a switch or fuse to the ground line.



Use a power supply that meets the following conditions:

Item	Condition (Other than /P1)	Condition (/P1)
Rated supply voltage	100 to 240 VAC	24 VDC/AC
Allowable power supply voltage range	90 to 264 VAC	21.6 to 26.4 VDC/AC
Rated power supply frequency	50/60 Hz	50/60 Hz (for AC)
Allowable power supply frequency range	50/60 Hz ± 2%	50/60 Hz ± 2% (for AC)
Maximum power consumption	35 VA (100 V), 45 VA (240 V)	18 VA (for DC), 30 VA (for AC)

Note

Do not use a supply voltage of 132 to 180 VAC, as this may have adverse effects on the measurement accuracy.

4. Protection of Environment

■ Control of Pollution Caused by the Product

This is an explanation for the product based on “Control of pollution caused by Electronic Information Products” in the People's Republic of China.

产品中有毒有害物质或元素的名称及含量

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr6+)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
显示器 (LCD)	N/A	N/A	N/A	✓	✓	✓
印刷电路板	N/A	N/A	N/A	✓	✓	✓
内部接线材料	N/A	N/A	N/A	✓	✓	✓
外壳 / 机箱	N/A	N/A	N/A	✓	✓	✓
金属	N/A	N/A	N/A	✓	✓	✓
电源	N/A	N/A	N/A	✓	✓	✓
操作键	N/A	N/A	N/A	✓	✓	✓
标准附件 / 可选附件	用于端子的螺丝	N/A	N/A	✓	✓	✓
	安装支架	N/A	N/A	✓	✓	✓
	CF 卡	N/A	N/A	✓	✓	✓
	SD 卡	N/A	N/A	✓	✓	✓
	分流电阻	N/A	N/A	✓	✓	✓
✓ : 表示该部件的所有均质材料中的有毒有害物质或元素的含量均低于 GB/T 26572 标准所规定的限量要求。						
N/A : 表示该部件中至少有一种均质材料中的有毒有害物质或元素的含量超过 GB/T 26572 标准所规定的限量要求。						
本产品的部分部件包含 RoHS 指令中的限用物质，但是其使用方法不受该指令限制。Some parts of this product include the restricted substances of RoHS Directive, but their applications are under the exemption of the directive.						

环保使用期限



该标志为环境保护使用期限，根据 SJ/T11364，适用于在中国（台湾、香港、澳门除外）销售的电子电气产品。
只要您遵守该产品相关的安全及使用注意事项，在自制造日起算的年限内，则不会因产品中有有害物质泄漏或突发变异，而造成对环境的污染或对人体及财产产生恶劣影响

注）该年数为“环保使用期限”，并非产品的质量保证期。零件更换的推荐周期，请参照使用说明书

■ Proper Disposal of This Product



This is an explanation of how to dispose of this product based on Waste Electrical and Electronic Equipment (WEEE), Directive and Regulation. Only valid in the EEA for EU WEEE Directive and in the UK for UK WEEE Regulation.

• Marking

This product complies with the WEEE marking requirement. This marking indicates that you must not discard this electrical/electronic product in domestic household waste. When disposing of products in the EEA or UK, contact your local Yokogawa office in the EEA or UK respectively.

■ How to Dispose the Batteries



This is an explanation about the EU Battery Directive/Regulation and UK Battery Regulation. Only valid in the EEA for EU Battery Directive/Regulation and in the UK for UK Batter Regulation. Batteries are included in this product. Batteries incorporated into this product cannot be removed by yourself. Dispose them together with this product. When you dispose this product in the EEA or UK, contact your local Yokogawa office in the EEA or UK respectively. Do not dispose them as domestic household waste.

Battery type: Lithium battery

Notice: The symbol (see above) means they shall be sorted out and collected as ordained in the EU Battery Directive/Regulation and UK Battery Regulation.

User's Manual

Installing the FXA120 DAQSTANDARD



IM 04L21B01-03EN

YOKOGAWA
Yokogawa Electric Corporation

Installing the DAQSTANDARD

To install the DAQSTANDARD, an appropriate license number (117-00000-5819) needs to be entered.

- Start Windows. Log onto Windows as an administrator.
- Double-click the downloaded file to extract the files.
- Double-click Install.exe.
- The installation program starts automatically. Follow the instructions on the screen to proceed with the installation.

The table below indicates what languages the user's manuals and software are installed in.

Language Selected at Time of Installation	Viewer		Hardware Configurator	
	Software	User's manual	Software	User's manual
English	English	English	English	English
German	German	English	German	English
French	French	English	French	English
Italian	Italian	English	Italian	English
Spanish	Spanish	English	Spanish	English
Portuguese	Portuguese	English	Portuguese	English
Russian	Russian	English	Russian	English
Korean	Korean	English	Korean	English
Japanese	Japanese	Japanese	Japanese	Japanese
Chinese	Chinese	Chinese	Chinese	Chinese

Note

- Before installing the software, check that your PC is not infected by a virus.
- Before starting installation, make sure that all the resident programs are exited.
- To re-install the software, first uninstall it, then re-install it.

The DAQSTANDARD user's manual is installed with DAQSTANDARD. To view it, on the Help menu, click User's Manual. Or, from the Start menu, select [Programs] - [DAQSTANDARD]. You can view the user's manual on Adobe Reader versions 7.0 and later.

System Requirements

OS	Windows 7	Home Premium, SP1 32-bit and 64-bit editions
	Windows 8.1	Professional, SP1 32-bit and 64-bit editions (Supports the desktop mode) Pro 32-bit and 64-bit editions (Supports the desktop mode)
	Windows 10	Home (32-bit, 64-bit editions) Pro (32-bit, 64-bit editions)
CPU and Main Memory	Pentium 4, 3 GHz or faster Intel x64 or x86 processor; 2 GB or more of memory	
Hard Disk	A free space of 100 MB or more (more space may be required, depending on the amount of data stored).	
Mouse	A mouse supported by the OS.	
Keyboard	A keyboard supported by the OS.	
Monitor	A video card that is recommended for the OS and a display that is supported by the OS, has a resolution of 1024×768 or higher, and that can show 65,536 colors (16-bit, high color) or more.	
Interface Port	When communicating through RS-232, use a COM port (COM1, COM2, COM3, or COM4) supported by Windows. When communicating through RS-422/RS-485, connect a converter to an RS-232 port. To communicate through an Ethernet connection, you need an Ethernet card supported by Windows. Also, the TCP/IP protocol must be installed.	
Printer	A printer supported by Windows is required. An appropriate printer driver is also required.	

Yokogawa will also stop supporting OSs that Microsoft Corporation no longer supports.

About the Usage of Open Source Software Heimdal

The DAQSTANDARD uses Heimdal source code.

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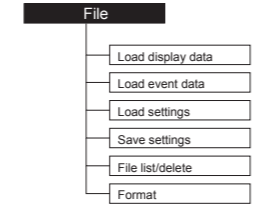
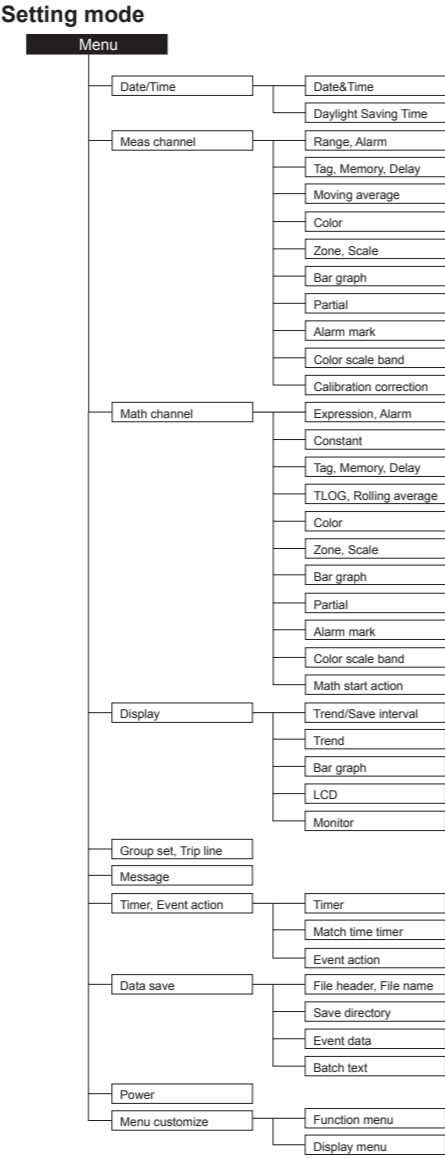
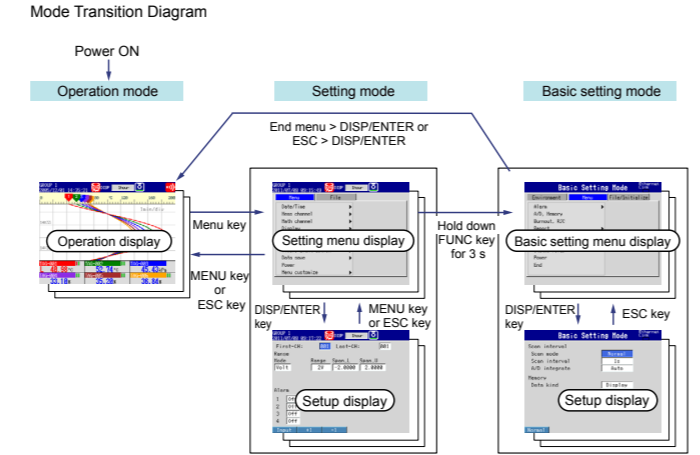
User’s Manual

FX1000

Mode Transition Diagram

Setting Mode / Basic Setting Mode Maps

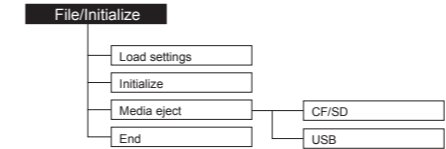
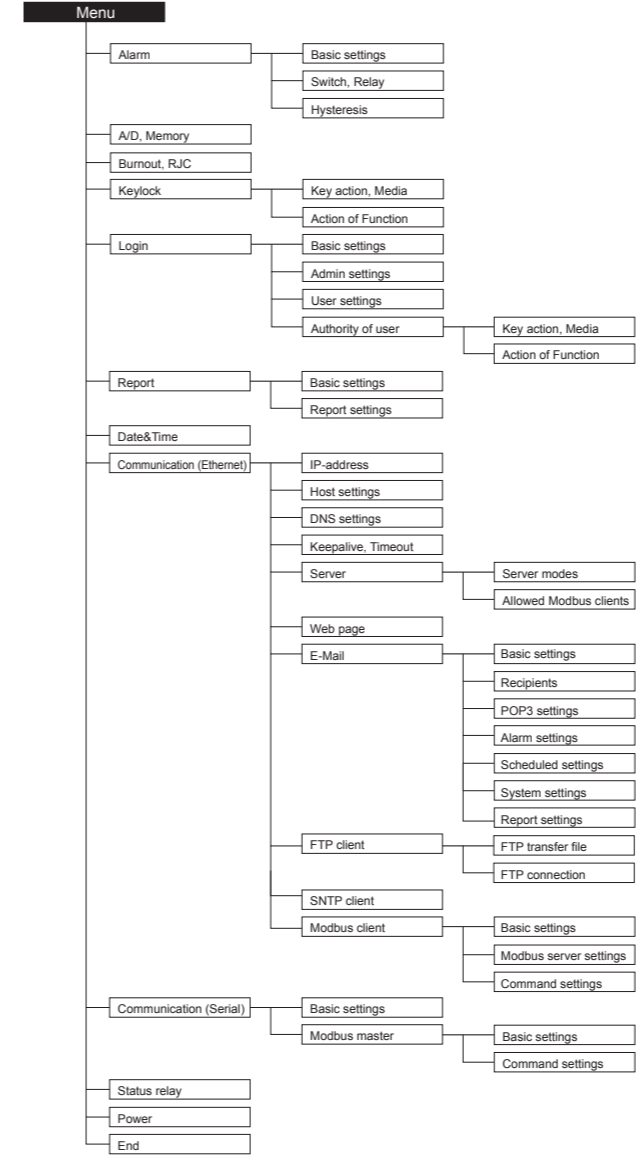
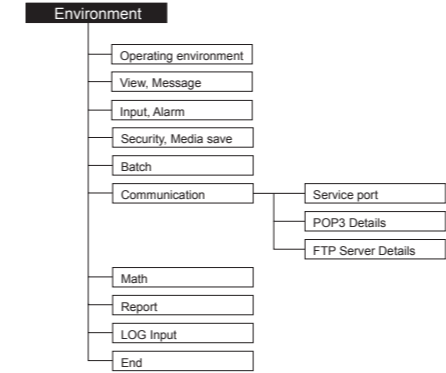
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The FX has three modes.

Mode	Description
Operation mode	A mode for performing measurements.
Setting mode	A mode for configuring settings, such as the input range and the measurement method. Most settings can be changed when memory sampling is in progress.
Basic setting mode	A mode for configuring basic settings, such as the scan interval and the measured data save method. You cannot switch to this mode when memory sampling is in progress.

Basic setting mode



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Revisions

1st Edition:	November, 2011	2nd Edition:	September, 2012
3rd Edition:	April, 2013	4th Edition:	November, 2015
5th Edition:	August, 2017	6th Edition:	November, 2017
7th Edition:	June, 2018	8th Edition:	June, 2020
9th Edition:	October, 2022	10th Edition:	August, 2023

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