FIXINST

F351x Series

Multi-function Display and Data Logger

· Instruction Manual ·

Version: 1.01

Experts in Compressed Air & Fluid Measurement

Fast · Accurate · Management

Preface

- Dear customer, thank you for choosing our products.
- This manual is a description of the use range, functions, installation and operation methods, troubleshooting, and maintenance of the product.
- The user must read this operation manual completely before using the device to properly use the product.
- After you read it, keep it in an accessible place for the next operational reference.

Notice

- Fix Instruments is not responsible for damage caused by unauthorized changes to the equipment without reviewing the operation manual or violating the provisions of this operation manual, and the instrument guarantee will be automatically voided.
- Fix Instruments is not responsible for incidental damage caused by transportation, equipment performance, or mishandling.
- Fix Instruments do not promise the suitability of this equipment for any application not described herein.
- Fix Instruments have tried to make the information in this manual correct. If you find any problems, you are welcome to contact us.
-

Contents

1 Safety Instructions

1.1 General Safety Instructions

	**Danger!** **Compressed air!** **Any contact with rapid air leaks or pressurized parts of the compressed air system can lead to significant injury or even death.**

- Never exceed the recommended pressure range.
- Make sure air tools & hoses are in good condition.
- Ensure the system is not under pressure when performing repair & maintenance.

	**Danger!** **Power voltage!** **Any contact with the electrical parts of the product can lead to significant injury or even death.**

- Consider all electrical installation-related regulations.
- Any power connections must be disconnected when performing repair & maintenance.
- Any electrical work on the system is to be performed by authorized personnel only.

	**Attention!** **Operating conditions!** **Please check the permissible operating conditions. Any operation beyond these limits could potentially cause measurement failure or even damage the instrument or the entire system.**

- Please review national standards and regulations during the preparation and installation process.
- The product is prohibited for use in explosive areas.
- Ensure the product operates within the allowed working conditions.

	**Caution!** **Product malfunction!** **Incorrect handling and improper transport could cause product malfunction.**

- Unauthorized disassembly of the product is prohibited.
- Use correct and appropriate tools to operate to product.
- In case the product malfunctions, please stop using it and contact customer support.

1.2 Storage and Transport Safety

- It is recommended to use the product's original packaging for storage and transport.
- Ensure the product operates at a temperature of 0 ··· +50 °C.
- Make sure that the product is stored at a temperature of -20 ... +70 °C.
- The storage humidity must be < 95 % and free of condensation.
- Avoid exposure to sunlight and UV rays.

1.3 Battery Safety

- Do not use accessories or chargers not recommended by the manufacturer.
- The built-in battery cannot be dismounted. Please contact the manufacturer for repair if necessary.
- When the device reaches the end of its life, follow local guidelines for proper disposal or recycling. Do not dispose of the device with regular trash.

2 Product Overview

2.1 Application

F351x integrates multi-sensor data collection, display and logging functions, providing an economical solution for field instrument central control and process data analysis.

F351x collects and records several groups of sensor measurement data with various methods such as digital interfaces, analog interfaces and wireless transmission. The real-time data curves can be used to realize local data visualization and data integration on the cloud. Analyze production process data from the trend view, accurately formulate production and process optimization plans, and efficiently complete daily equipment maintenance.

Based on the standard Modbus RTU protocol, F351x supports connection of third-party devices. With FixInst configuration software, field devices can be quickly configured.

Using a 7" ultra-wide viewing angle touch LCD screen and a high-performance display platform, F351x has clear data display and smooth operation.

Supports up to 255 sensors access, local display, curve trend analysis and data recording.

2.2 Features

- ✓ Centralized collection of field sensors and data curve trends, effective analysis of process data
- ✓ (Option) with data logger, 2,000,000,000 values
- ✓ With 7" IPS ultra-wide viewing angle LCD, high resolution
- ✓ Data display, easy and smooth operation
- ✓ Fully isolated electrical structure can completely filter out field disturbance
- ✓ Two isolated Modbus RTU (RS485) interface, supports up to 255 sensor inputs
- ✓ (Option) Sensor wireless gateway, supports connecting field sensors and devices via wireless connection
- ✓ Standard Ethernet interface, supports LAN connection
- ✓ (Option) 4G could platform gateway, support uploading data to cloud wirelessly
- ✓ IP65 protection, applicable to various industrial fields

2.3 Scope of Delivery

Description	QTY	Unit	Note
F351x main unit (with face cover + buckle)	1	set	Panel mount
F351x main unit (with face cover + back cover + wall mounting bracket)	1	set	Wall mount
F351x main unit (with face cover + back cover +rail bracket)	1	set	DIN rail
Other accessories	1	pcs	Optional
Envelope (quick guide)	1	pcs	Standard

2.4 Technical Data

Display	
Display	7'' IPS touch LCD
Resolution	1280 × 800
Signal Inputs	
Digital Signal	2 isolated RS485 inputs, supports up to 255 Modbus RTU sensor inputs
Analog Signal	4 × [0 ··· 20 mA / 4 ··· 20 mA / 0 ··· 1 VDC / 0 ··· 10 VDC] channel (Option)
Wireless Signal	Sensor wireless gateway (Option)
Output	
Digital Signal	Modbus RTU (RS485) Modbus TCP (Ethernet) USB Type-C
Alarm Signal	2 × Relay alarm channel, 230 VAC, 3A
Wireless Signal	4G cloud platform gateway (Option)
Power	
AC Power	100 ··· 240 VAC, total power 75W Power supply for sensors 60W (S1701 0011)
DC Power	18 ··· 30 VAC, total power and power supply for sensors are dependent on customer power supply (S1701 0012)
Data Logging	
Storage	25 G, 3,000,000,000 values
Data Export	USB Type-C
Operating Environment	
Operating Temperature	0 ··· +50 °C
Storage Temperature	-20 ··· +70 °C
Relative Humidity	0 ··· 95 %RH
Other	
Connector	Wiring terminal
Protection	IP65
Housing Material	PC + ABS

Housing Dimension	Refer to “Product Dimension”
Installation	Panel/Wall-mounted/DIN-rail (for use with wall-mounted casing)
Cable diameter	4 ··· 8 mm
Certification	Conforms to CE marking standard

3 Dimension & Installation

3.1 Product Dimension

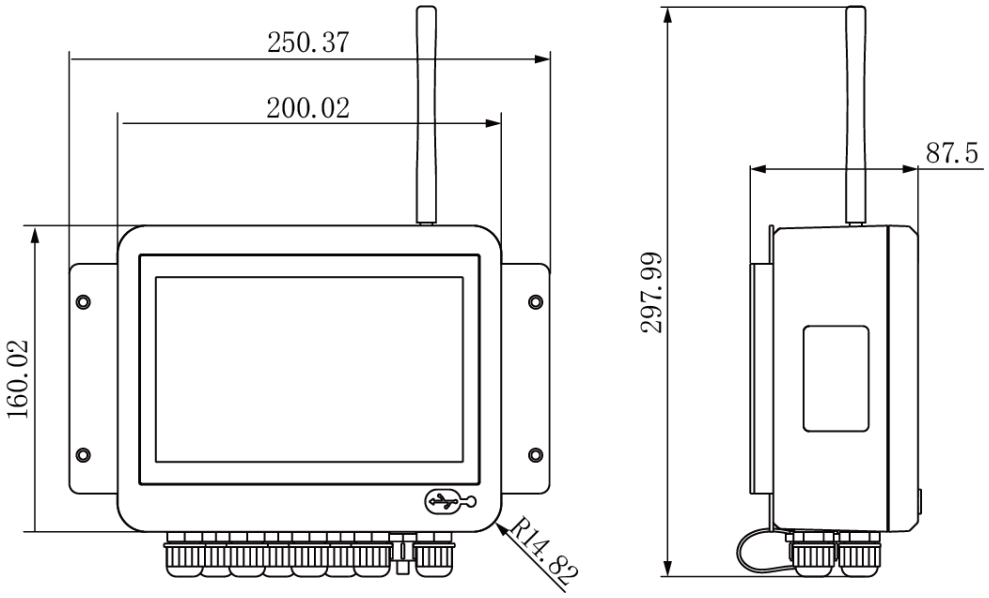


Figure 3-1 F351x Dimension for Wall-mounted Installation

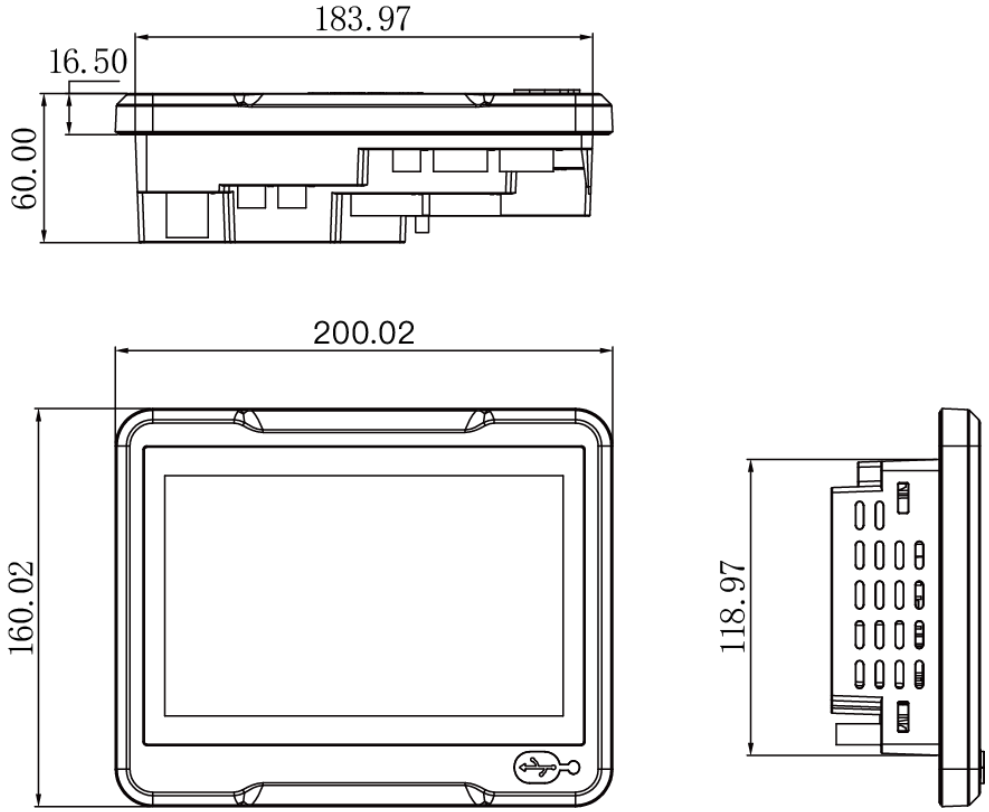


Figure 3-2 F351x Dimension for Panel Installation

3.2 Product Installation Guide

3.2.1 Panel Installation

Step 01

As shown in Figure 3-3, get the product F351x (panel type) and place it into the reserved product opening.

Reserved opening dimensions: Length × Height = 220.5 × 120.5 mm, R = 10.5

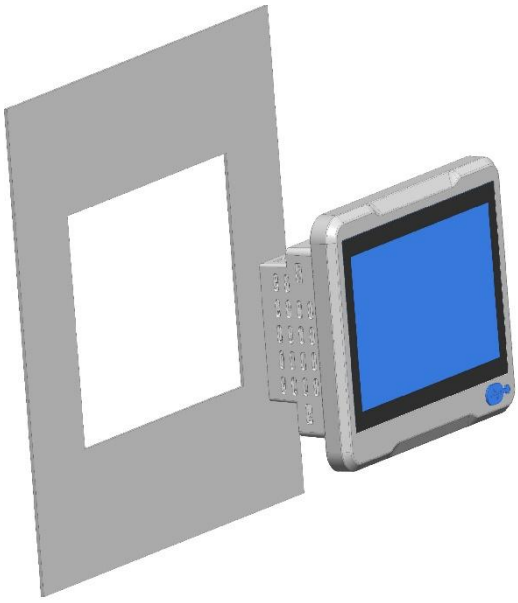


Figure 3-3 Panel Type F351x Installation Step 01

Step 02

Take out the four buckles from the accessories, insert them into the mounting holes on the back of the panel, and fasten them using a screwdriver. After installation, proceed with the electrical wiring steps as described in Section 3.3.

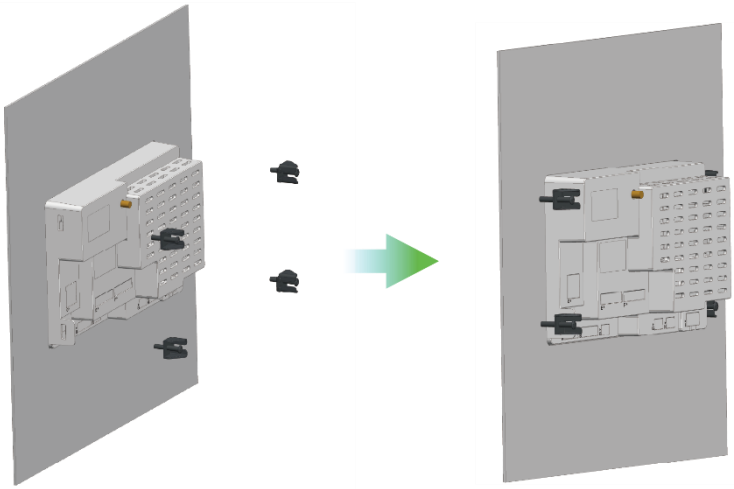


Figure 3-4 Panel Type F351x Installation Step 02

3.2.2 Wall-mounted Installation

Step 01

Use a screwdriver to remove the back cover of the product and proceed with the electrical wiring steps (refer to Section 3.3)

Figure 3-5 Wall-mounted F351x Installation Step 01

Step 02

Reinsert the four removed screws into the mounting holes of the back cover and tighten them with a screwdriver.

Figure 3-6 Wall-mounted F351x Installation Step 02

Step 03

Take out the four M3 self-tapping screws from the accessories, place the mounting bracket on the back of the

product, align it with the screw holes, and tighten them with a screwdriver.

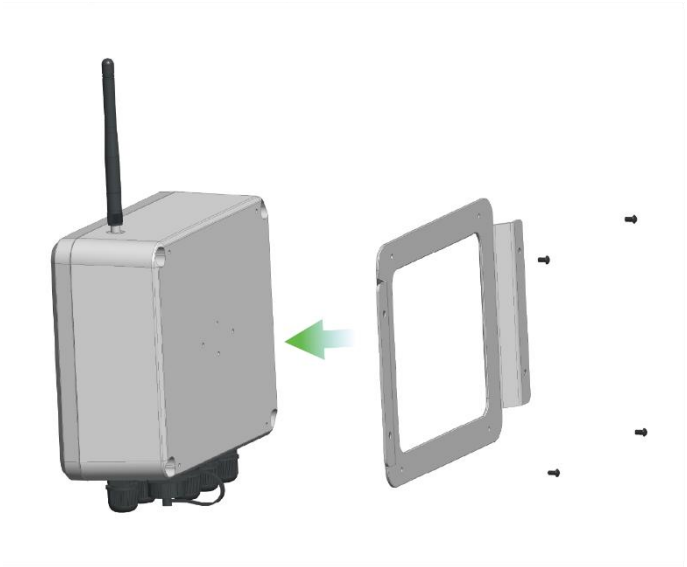


Figure 3-7 Wall-mounted F351x Installation Step 03

Step 04

Place the F351x at the designated mounting position on the wall. Take out four M3 self-tapping screws, insert them through the screw holes on the bracket, and tighten them with a screwdriver to complete the installation.

Figure 3-8 Wall-mounted F351x Installation Step 04

3.2.3 DIN-Rail Installation

Step 01

Use a screwdriver to remove the back cover of the product, proceed with the electrical wiring steps (refer to Section 3.3), and reinstall the back cover.

Figure 3-9 DIN-Rail F351x Installation Step 01

Step 02

After securing the screws, slide the F351x into the pre-installed rail slot on the wall, and adjust its position as needed.

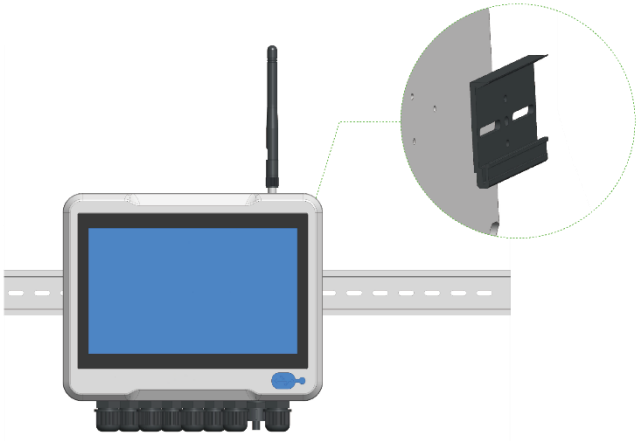


Figure 3-10 DIN-Rail F351x Installation Step 02

3.3 Electrical Connection

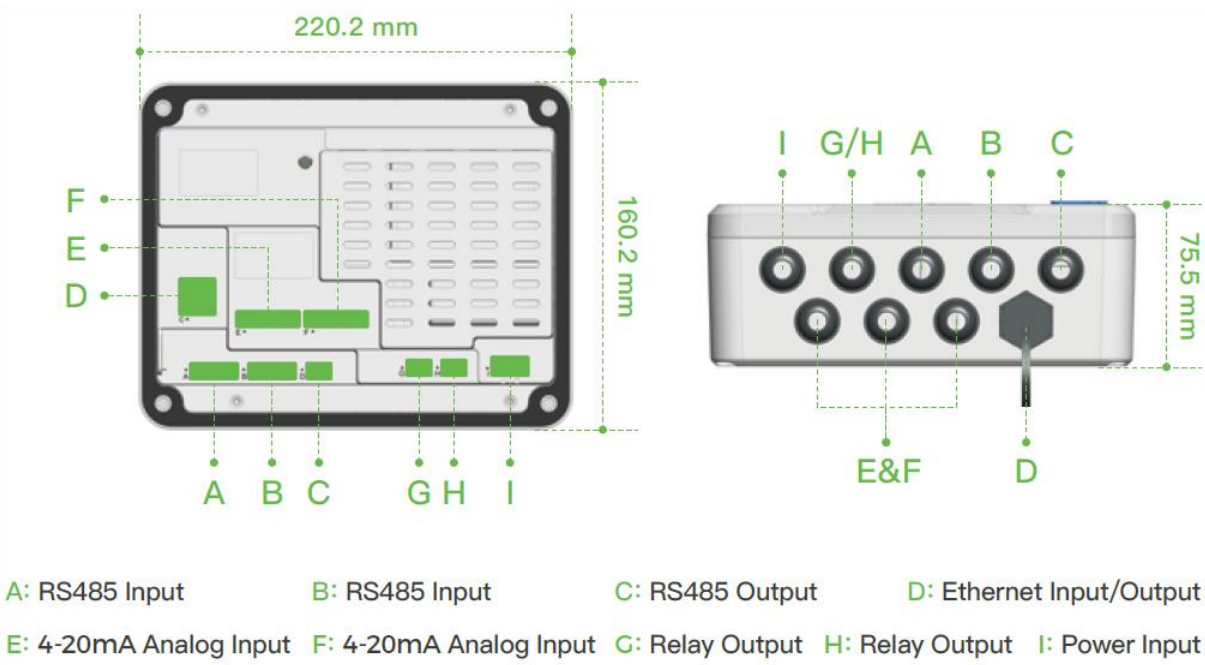


Figure 3-11 F351x Electrical Connection Diagram

F351x Wiring Signal Pin Definitions

	Pin1	Pin2	Pin3	Pin4	Pin5	Pin6	Pin7	Pin8
Con. A	NC	VO-	VO+	RS485 A+	RS485 B-	RS485 Ground		
Con. B	NC	VO-	VO+	RS485 A+	RS485 B-	RS485 Ground		
Con. C	RS485 A+	RS485 B-	RS485 Ground					
Con. D	Ethernet port (1G Ethernet interface)							
Con. E	VO+	VO-	VI_D-	VI_D+	VO+	VO-	VI_C-	VI_C+
Con. F	VO+	VO-	VI_B-	VI_B+	VO+	VO-	VI_A-	VI_A+
Con. G	NO	COM	NC					
Con. H	NO	COM	NC					
Con. I	L V+	N V-	PE (220 VAC) PE (24 VDC)					

4 Operation

4.1 Value Interface

After the device powered on and configuration done, the following value interface will show.

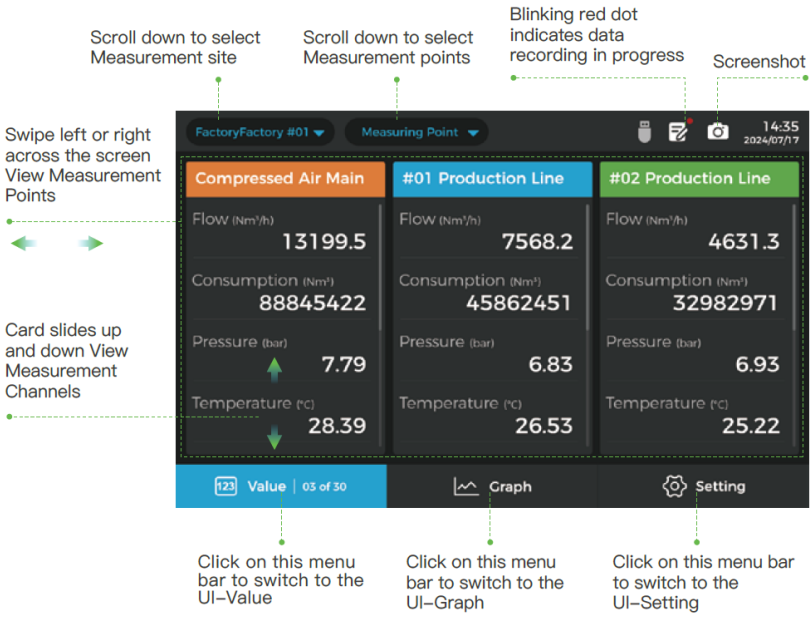


Figure 4-1 F351x Value Interface

4.2 Graph Interface

Click the **Graph** button to enter the graph interface, as shown below.

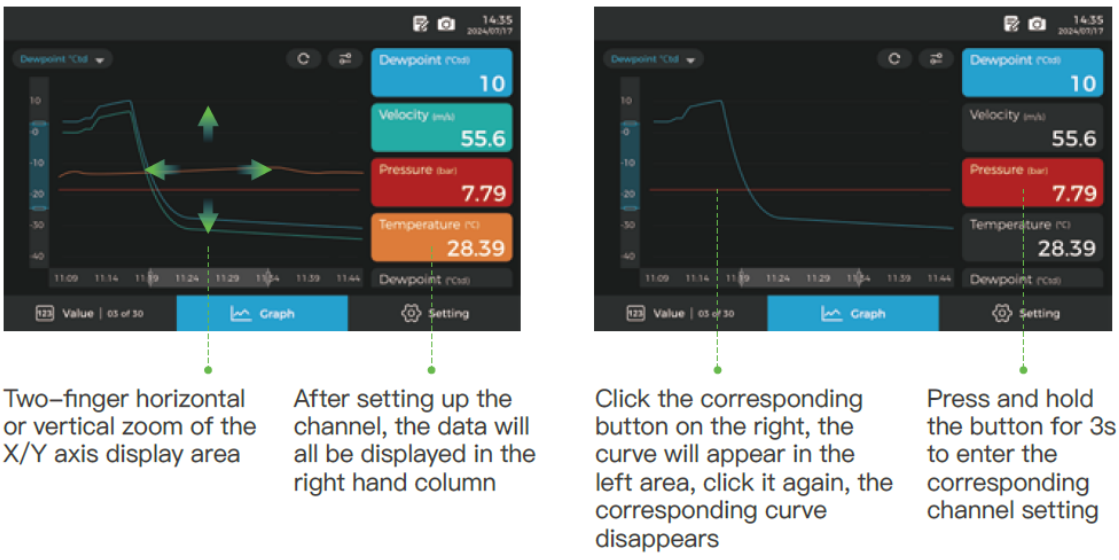


Figure 4-2 F351x Graph Interface

4.3 Setting Interface

Click the **Graph** button to enter the graph interface, as shown below.

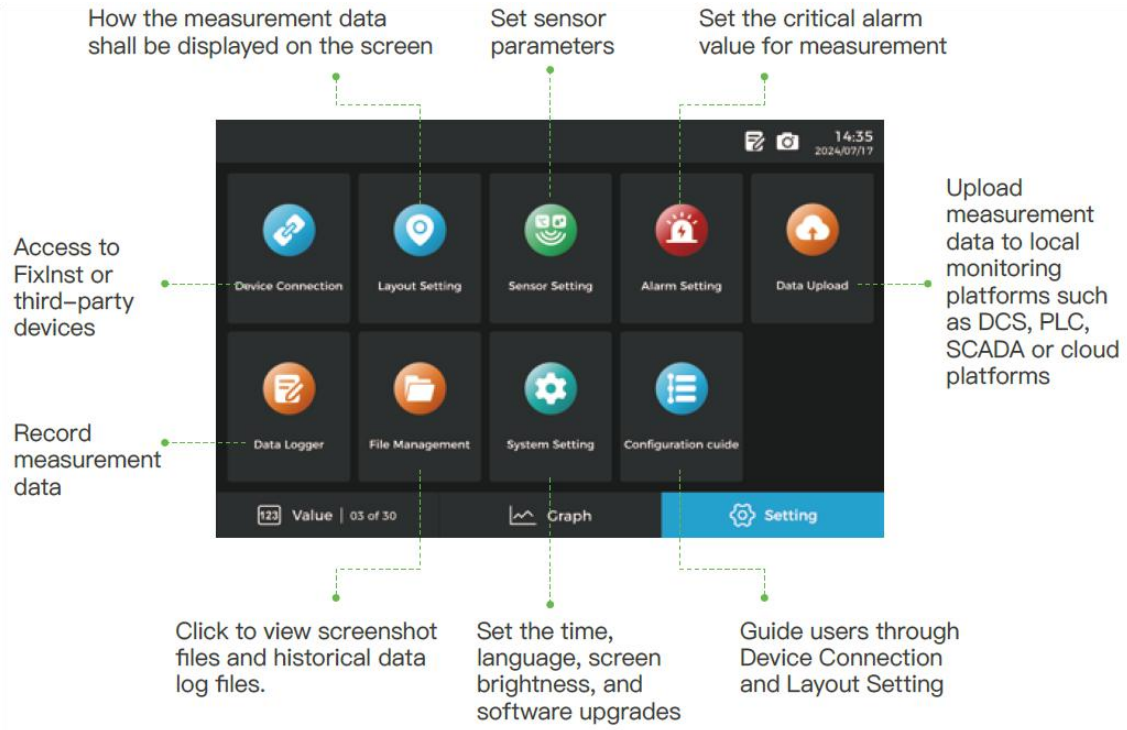
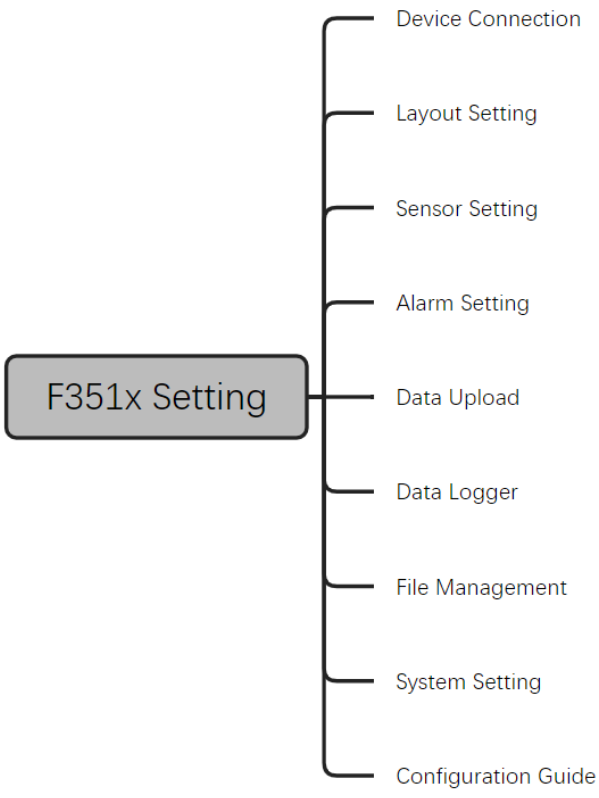


Figure 4-3 F351x Setting Interface

4.4 Setting Menu



Device Connection	
Modbus	Modbus Master settings. The factory settings are as follows: • Baud rate: 9600 • Data length: 8, Parity bit: None, Stop bit: 1 • Response timeout: 1 second • Response delay: 0 ms • Frame interval: 7 characters
	Auto Search. If the F351x is connected to a FixInst device, click this button to perform an automatic search and complete the device connection.
	Manual Add. When you need to connect a third-party device to the F351x, click this button to proceed. For detailed instructions, refer to section 4.4.2 **Manual Add Device.**
FixInst Device	The FixInst sensor can be configured offline in advance before being connected.
Third Party Device	It supports connecting third-party devices.
Analog Device	It supports analog signal input, with configurable ranges of 4-20 mA, 0-20 mA, 0-1 VDC, and 0-10 VDC.
Virtual Device	Perform basic mathematical operations on the measurement channels to obtain a new channel (virtual channel). For example, Power ÷ Flow = Specific Power.
Device Description	When doing Auto Search, F351x will generate the device description automatically. When doing Manual Add, user will define the device description by himself.
Model	Model of device connected, e.g. F211A
Serial No.	Product serial number.
Operation	 Edit: to modify the device setting and configuration, e.g. device description, add or delete measuring channels.  Delete: delete the device.
Layout Setting	
Auto Layout	The system automatically creates locations and measurement points, and automatically associates all physical channels.
Clear Layout	Clear all locations and measurement points.
	Add new location or measurement point.
	Delete location or measurement point.
Sensor Setting	
Flow Sensor Setting	Set the parameters of the flow sensor, e.g. pipe diameter.

Dewpoint Sensor Setting	Set the parameters of the dewpoint sensor, e.g. unit.
Other Sensor Setting	
Alarm Setting	
Channel	Select the alarm channel.
Unit	Display the unit of the measurement channel.
Threshold	Exceeding this set value will trigger an alarm. An alarm icon will appear in the screen's status bar, and a red indicator will show on the measurement value page. If a relay is assigned to this channel, the relay state will change accordingly.
Direction	Up: Trigger alarm when the measurement value is above the threshold. Down: Trigger alarm when the measurement value is below the threshold.
Hysteresis	Tolerance for alarm clearance. For example, if the threshold is 7 bar, the direction is set to **Up** and the hysteresis is set to 0.5, the alarm will only be cleared when the measurement value drops below 6.5 bar. If the threshold is 7 bar, the direction is set to **Down** and the hysteresis is set to 0.5, the alarm will only be cleared when the measurement value exceeds 7.5 bar.
Relay	The default is **None**, meaning that after the alarm is triggered, it will only be indicated on the F351x screen, and the relay will not be activated. To enable relay alarms, select **G** or **H** and refer to section 5.4 **Relay Output** for hardware connections.
Data Upload	
Modbus RTU	The F351x acts as a slave device and uploads data to the master device (PLC, DCS, SCADA, etc.). The factory settings are as follows: • Address: 1 • Baud rate: 9600 • Data length: 8, Parity bit: None, Stop bit: 1 • Response timeout: 1 second • Response delay: 0 ms • Frame interval: 7 characters
Modbus TCP	The F351x acts as a slave device and uploads data to the master device (PLC, DCS, SCADA, etc.). The factory setting is to automatically obtain an IP address (DHCP).
4G Communication	Option (S1701 0010). If this function is selected, you can view and modify SIM card relevant parameters here.
Data Logger	
Start	Click this button to start data logging. Once successfully started, a data logging icon will appear in the status bar.
Stop	Click this button to stop data logging. Once successfully stopped, the data

	logging icon will disappear from the status bar.
Description	Name the record files.
Start Time	The start time of data logging.
Auto Stop	Automatically stops data logging after this time is reached.
Stop Time	The stop time of data logging.
Interval	Interval for data logging.
Select Recorded Channel	Select the measurement channels for data logging.
File Management	
Record Files	The recorded data files are stored here.
Screenshot Files	The screenshot files are stored here.
Protocol	Export the Modbus register address table.
System Setting	
Screen Setting	Adjust screen brightness and set the off-screen.
Language	Set the system language: Chinese, English.
Date & time	Adjust the system current date and time.
System Info	Display the hardware and software version information of the device.
System Upgrade	Upgrade the system firmware.
System Restart	Restart the system.
Configuration Guide	

4.5 Manual Operation

4.5.1 Manually Add a FixInst Device

1. Click Manual Add Button in the upper-right corner of the **Device Connection** interface. Select **FixInst devices** to enter the **Add Device** interface.
2. Set the device type, description, device port, device address and other parameters.
3. In the **Channel Setting** section, select the channels you want to display in **Layout Setting** by checking the corresponding boxes.
4. After the setting is complete, click the back arrow in the upper-left corner to return to the **Device Connection** interface. Your settings will be saved automatically and shown in the device list.
5. You can click the edit icon on the right side of the device list at any time to modify the device settings in the

Edit Device interface.

4.5.2 Add a Third-Party Device

1. Click Manual Add Button in the upper-right corner of the **Device Connection** interface. Select **Third devices** to enter the **Add Device** interface.
2. Set the description, SN, device port, device address and other parameters.
3. In the **Register Setting** section:
   - Click the Add button (top-left) to create a new channel setting page.
   - Click the Delete button (top-right) to remove the current channel page.
   - Use the left/right arrows to switch between pages.
   - On each page, set the channel description, unit, resolution, function code, register address, mea. value type, mea. value format and other parameters.
4. After the setting is complete, click the back arrow in the upper-left corner to return to the **Device Connection** interface. Your settings will be saved automatically and shown in the device list.
5. You can click the edit icon on the right side of the device list at any time to modify the device settings in the **Edit Device** interface.

4.5.3 Add an Analog Device

1. Click Manual Add Button in the upper-right corner of the **Device Connection** interface. Select **Analog devices** to enter the **Add Device** interface.
2. Set the description, analog port, analog type and other parameters.
3. **Analog Setting**, including channel description, unit, resolution, and scaling.
4. After the setting is complete, click the back arrow in the upper-left corner to return to the **Device Connection** interface. Your settings will be saved automatically and shown in the device list.
5. You can click the edit icon on the right side of the device list at any time to modify the device settings in the **Edit Device** interface.

4.5.4 Add a Virtual Device

1. Click Manual Add Button in the upper-right corner of the **Device Connection** interface. Select **Virtual devices** to enter the **Add Device** interface.
2. Set the device description and channel description.
3. The F351x supports two types of virtual channels: Preset and Customized.
   - For Customized formulas, the right side of the interface will display a textbox and a channel list. Click the textbox to bring up the calculator on the left side. Select a channel from the list to insert its index into the textbox. The calculator can then be used in conjunction with the textbox to create a customized formula for the virtual device. If there is an error in the formula, the text in the textbox will turn red, and it will revert to white once the formula is corrected.

- For Preset formulas, the right side displays required parameters. Click the Add Parameter button to enter the parameter configuration interface, and select the channels that need to be involved in the calculation by checking the checkboxes in front of the channels. After completion the selection, click the back arrow in the upper-left corner to return to the **Add Device** interface. The number of selected channels appears on the right side of the Add Parameter button.

4. Unit and resolution are auto-generated, but you can edit them if needed.
5. After the setting is complete, click the back arrow in the upper-left corner to return to the **Device Connection** interface. Your settings will be saved automatically and shown in the device list.
6. You can click the edit icon on the right side of the device list at any time to modify the device settings in the **Edit Device** interface.

5 Signal Output

5.1 Modbus RTU Output

5.1.1 Communication Parameters

The factory setting parameters are as shown below:

- Address: 1
- Baud rate: 9600
- Data length: 8, Parity bit: None, Stop bit: 1
- Response timeout: 1 second
- Response delay: 0 ms
- Frame interval: 7 characters

All parameters could be modified through the menu as follows:

Figure 5-1 F351x Modbus RTU Communication Parameter Setting Interface

5.1.2 Storage Register Definitions

Logical Channels, Data and Holding Registers.

- You can use Modbus command 0x03 to read holding register data.
- You can use Modbus command 0x06 to write a single holding register, and 0x01 to continuously write

multiple holding registers.

- You can use command 0x05 to write to coil registers.

5.1.3 Process Data Format

Supports two data types: IEEE 754 floating point and unsigned integer.

Floating point format:

Number (with decimals)	IEEE 754 Floating Point	Register N		Register N + 1	
		High	Low	High	Low
123.4	0x42F6CCCD	0xCC	0xCD	0x42	0xF6

Unsigned integer:

Number (decimal system)	Number (hex system)	Register N		Register N + 1	
		High	Low	High	Low
123456789	0x075BCD15	0xCD	0x15	0x07	0x5B

5.1.4 Byte Order

The format of the data is little-endian, with the least significant bit transmitted first.

32 bit: CD AB

64 bit: GH EF CD AB

5.2 Modbus TCP Output

The F351x supports Ethernet communication and can be configured with a static IP address or use DHCP to automatically obtain and IP address.

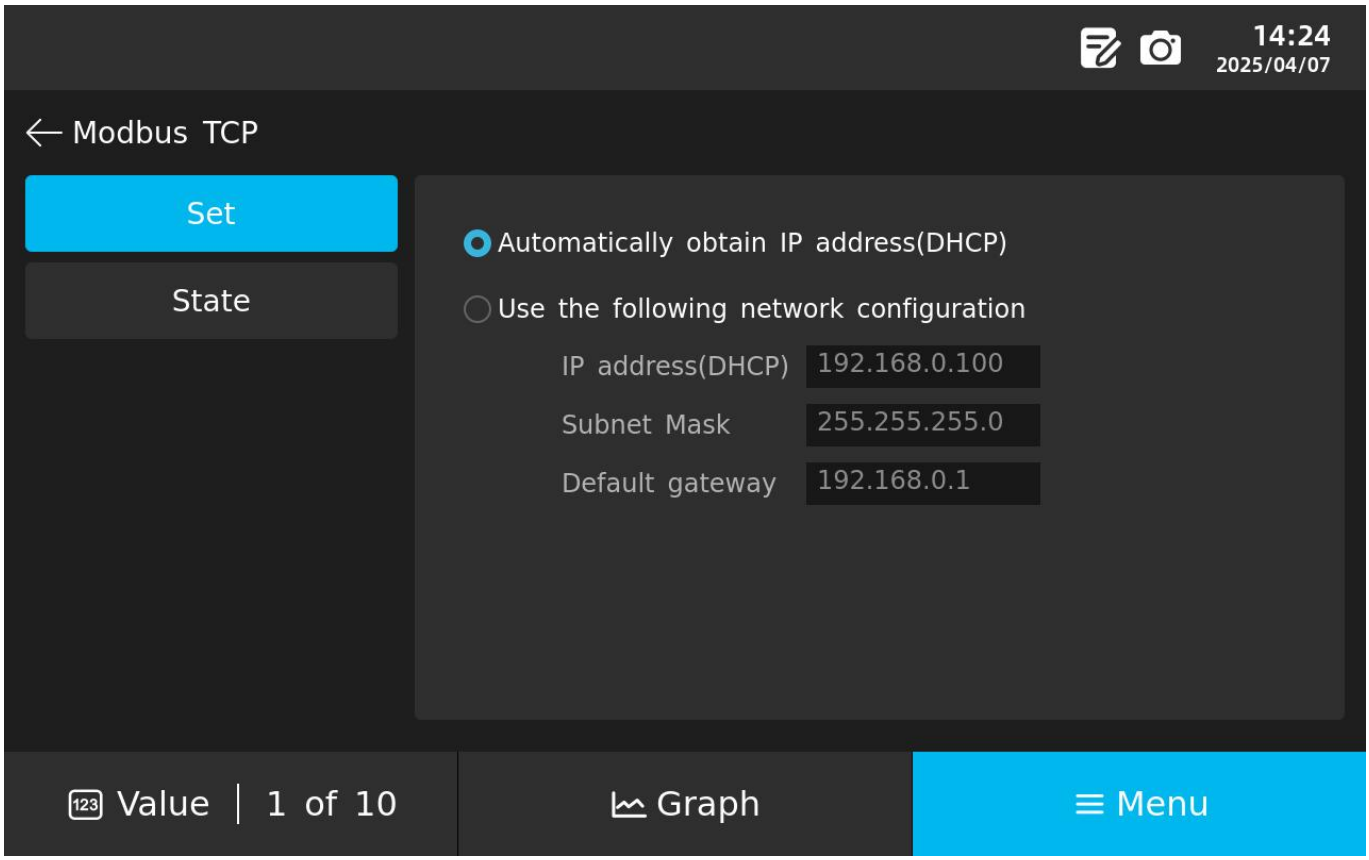


Figure 5-2 F351x Modbus TCP Communication Parameter Setting Interface

5.3 Holding Register: Process Data Address Table

The register address table of the F351x is not fixed. When connecting different types of sensors, the corresponding register address tables will vary. Insert a USB drive, then go to **Setting** -> **File Management**, and click on **Protocol** to export the register address table into the USB drive.

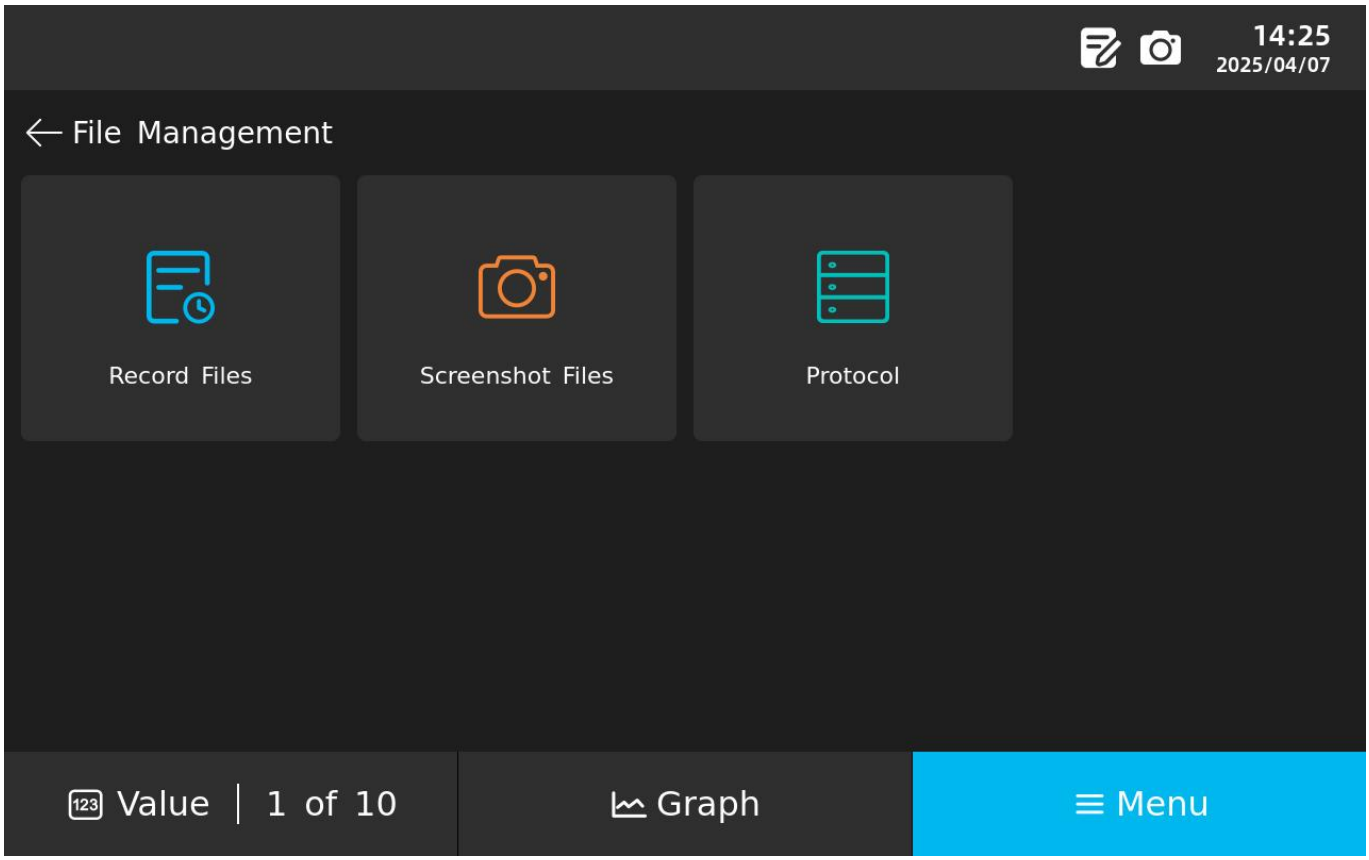


Figure 5-3 F351x File Management Interface

5.4 Relay Output

The F351x has two relay outputs, G and H, with a specification of 230 VAC, 3A.

	Pin	Signal	Description
Connector G / H	1	NO	Normal Open (Being Open when power off and alarm is not triggered; Being Closed when alarm is triggered)
	2	COM	Ground
	3	NC	Normal Closed (Being Closed when power off and alarm is not triggered; Being Open when alarm is triggered)

Note: Enter the **Alarm Setting** menu by pressing the **Setting** button. For the measurement channels that require relay activation, select either relay G or H. If you need to turn on a device (such as a sound and light alarm) when the alarm condition is met (measurement value exceeds the threshold), connect the device to Pin1 (NO); if you need to turn off a device (e.g. a compressor) when the alarm condition is met, connect the device to Pin3 (NC).

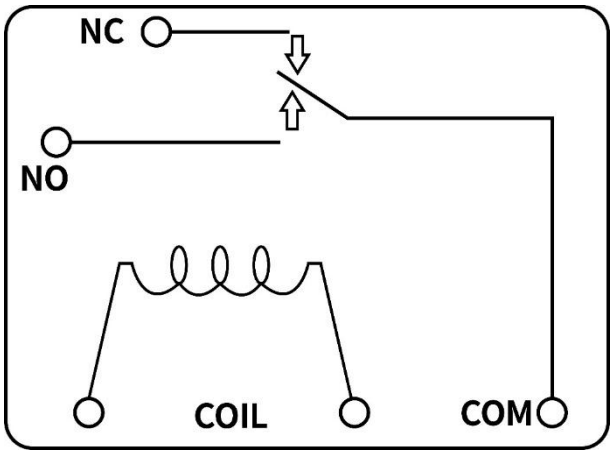


Figure 5-4 F351x Relay Diagram

6 Troubleshooting

Trouble Description	Possible Reason	Solution
Black screen with no display	1. Wrong wiring 2. Display malfunction	1. Check the wiring 2. Exchange the display (contact the service people)
Modbus RTU communication doesn't work	1. Wrong wiring 2. Wrong setting for communication address, baud rate and data format 3. Wrong setting on the host computer (PLC, DCS, SCADA and etc.)	1. Check the wiring 2. Reset Modbus parameters: address, baud rate and data format 3. Check the communication settings on the host computer

7 Data Acquisition and Monitoring System

7.1 Cabling Network

Using the RS485 and Ethernet communication interfaces of the F351x, a data acquisition and monitoring system can be established through wired connections using the Modbus RTU and Modbus TCP communication protocols.

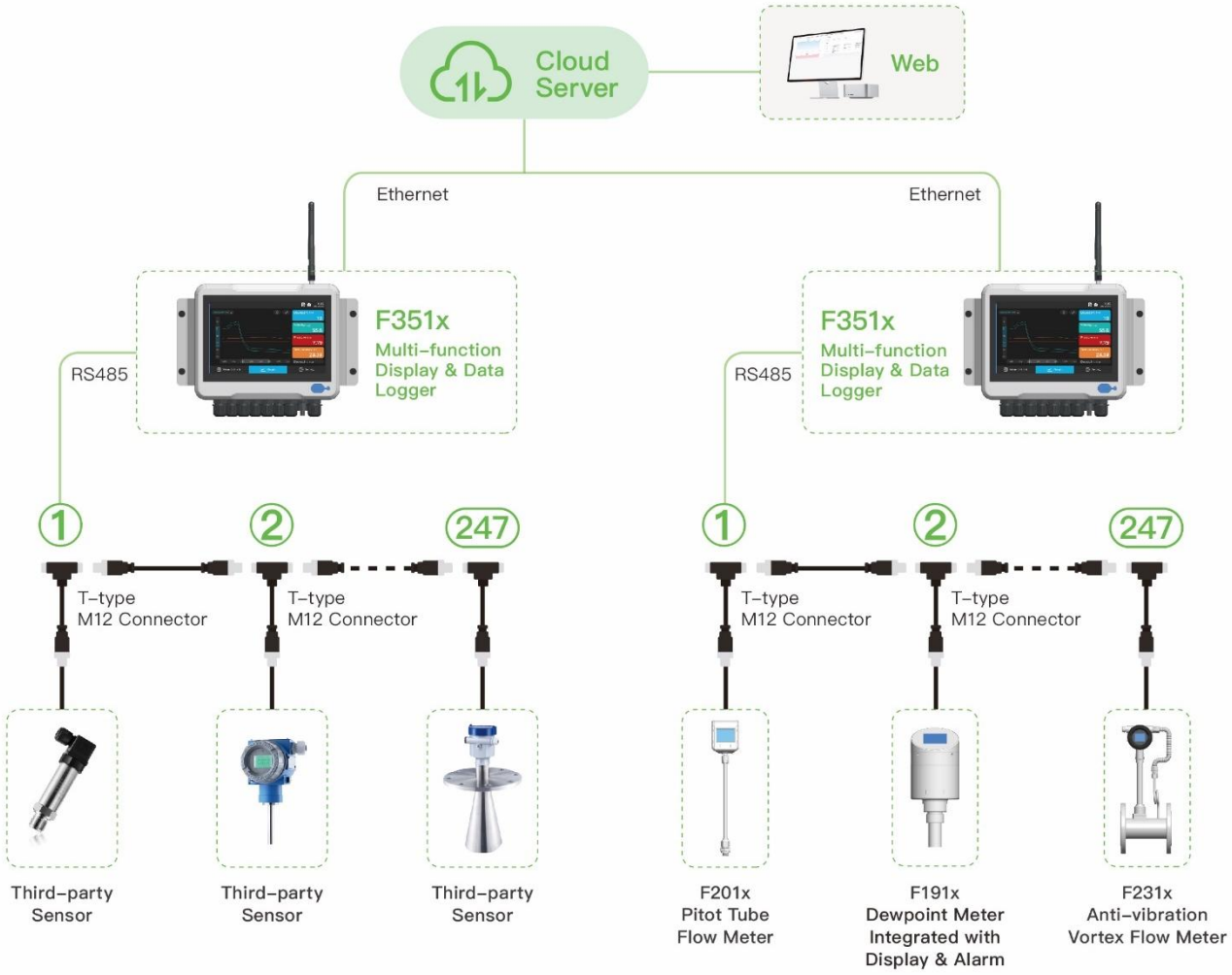


Figure 7-1 F351x Data Acquisition and Monitoring System (Cabling Network)

7.2 Wireless Network

Using the external (or sensor integrated) Wi-SUN Sub-module, F351 Wi-SUN Module and F351x 4G module, a

data acquisition and monitoring system can be established wirelessly.

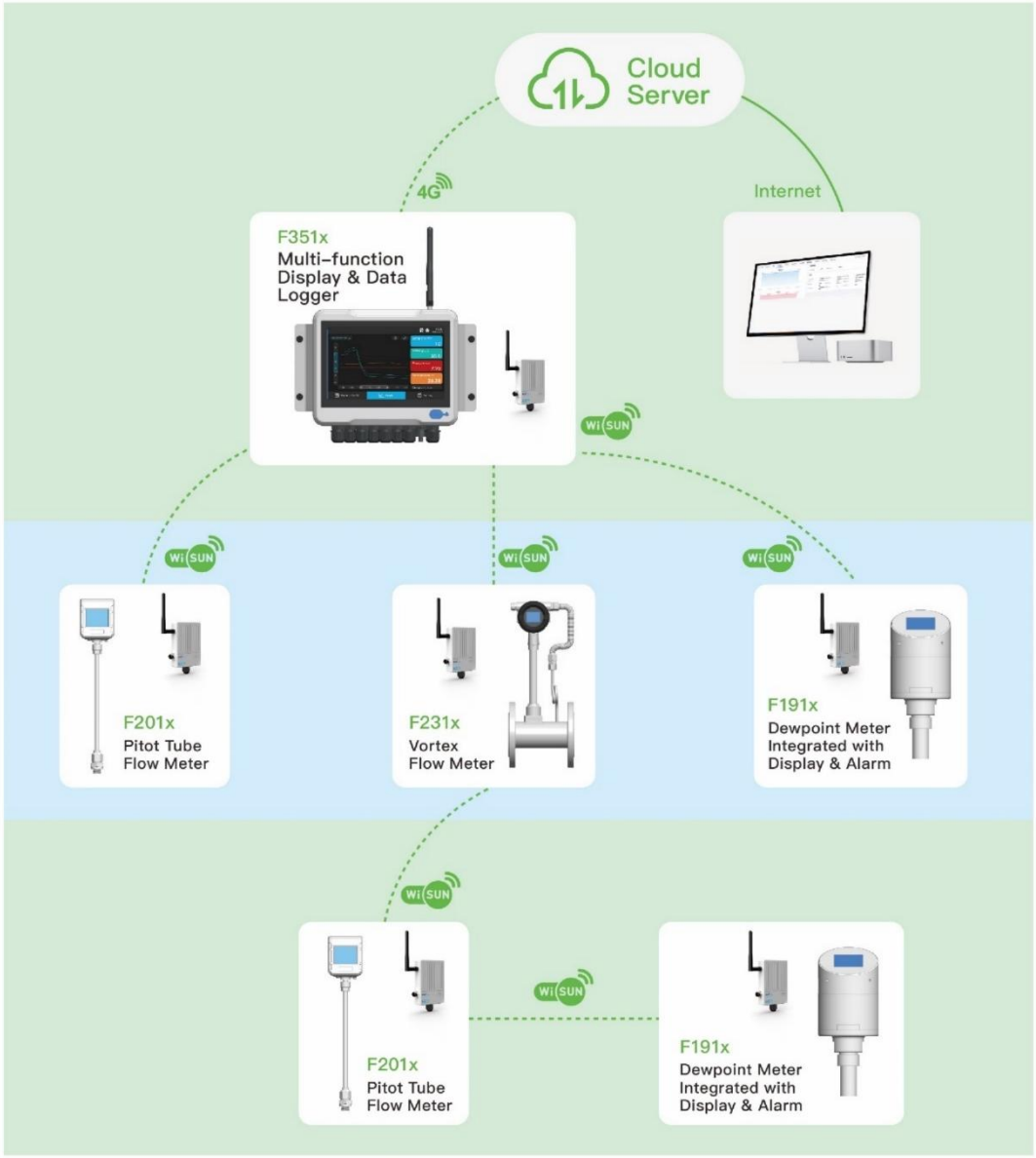


Figure 7-2 F351x Data Acquisition and Monitoring System (Wireless Network)

8 Warranty Terms

Dear Customer：

Thank you for choosing FixInst products. We have always been committed to providing our customers with high-quality, high-performance instrumentation products to meet your needs in a variety of application scenarios.

In order to ensure your satisfaction after purchasing the product, please read the following after-sales terms and conditions carefully, so that you can correctly and efficiently apply for the warranty service when needed.

8.1 Warranty Period

12 months from product shipment.

8.2 Warranty Coverage

1、Warranty period due to the product's own problems caused by performance failures, confirmed by the seller's test, will provide free maintenance services; human misuse or due to the site of the product working conditions and the product type does not match the damage caused by the exceptions.

The following are not covered by warranty：

① Product damage caused by force majeure factors (such as natural disasters, etc.).

② Products due to natural wear and tear, rough handling caused by the appearance of damage, scratches or wear (such as impact caused by the loss of paint, surface bumps, etc.).

③ Damage caused by disassembling the product without the Company's consent or unauthorized changes in the use of the product.

④ Damage to the product caused by repair or modification not authorized by the company.

⑤ Damage caused by improper use of the product by the user or operation in violation of the instructions.

⑥ Products purchased from unauthorized sources.

2、For non-warranty or non-warranty product failure, we will provide paid repair services, the specific cost depends on the actual situation.

8.3 Warranty Certificate

Users are required to provide valid proof of purchase (e.g., invoice, receipt, etc.) and product serial number when applying for warranty service.

8.4 Warranty Channels

Users can apply for after-sales warranty service by filling out our after-sales treasure system or contacting customer service personnel.

https://www.fix-instruments.com/h-col-143.html

Experts in Compressed Air &
Fluid Measurement

Fix Instruments (Shenzhen) Co., Ltd.

A: 2/F,Middle Block, Building B, TG Science Park, No. 2 Luozu Industrial Avenue, ShiYan Subdistrict, Baoan District, Shenzhen, GuangDong, China

M: sales@fix-instruments.com

P: 0755-2359-1123