



FLOW CONTROLS

Flow Controls FC-IOT Flow Meter Electronic Control Brief Instruction Manual



- Thank you for using the smart flow meter electronic control device
- Please read this manual carefully before installation and use, and follow the instructions.

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1. Product Description

1.1. Product description

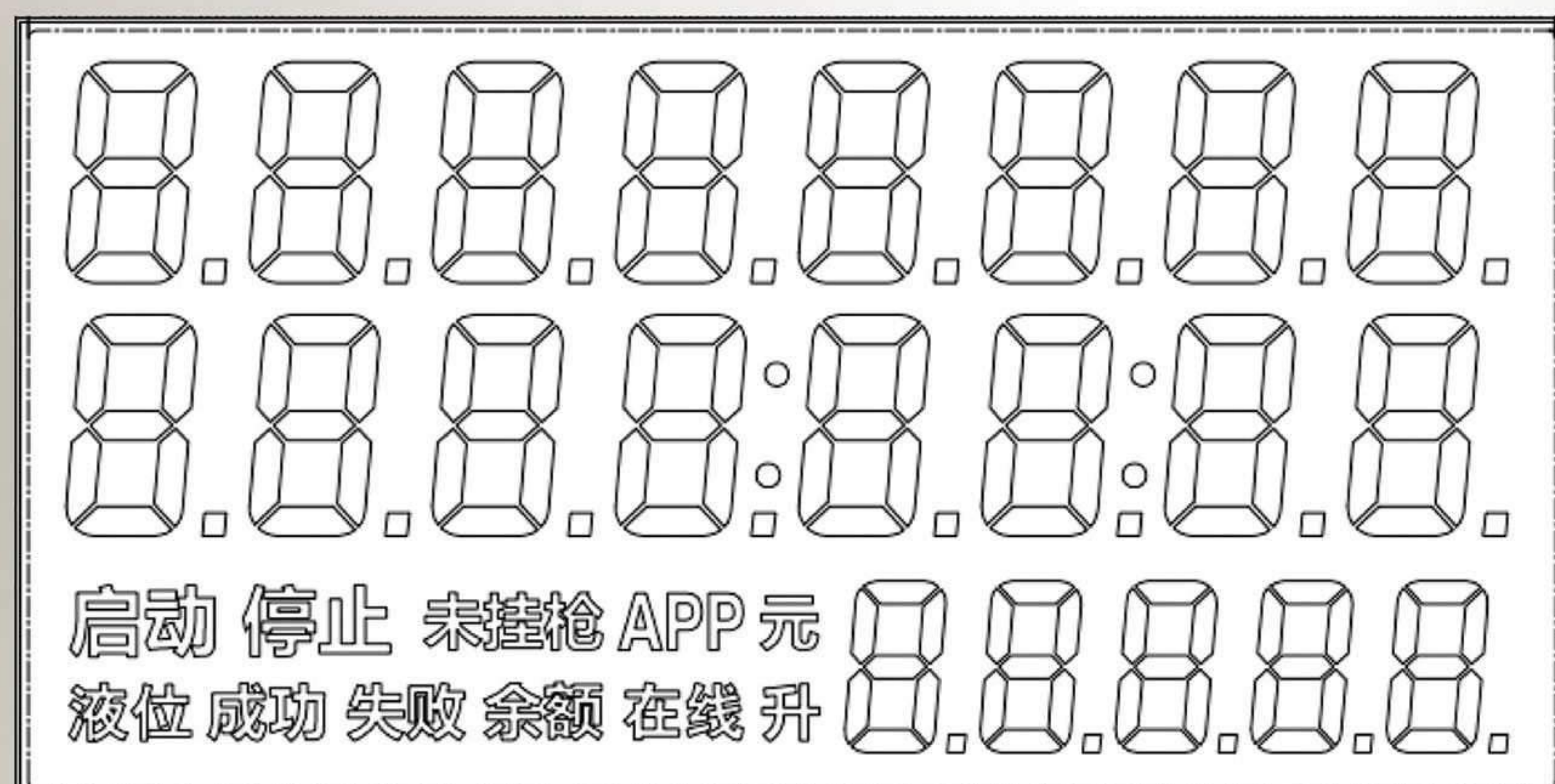
The purpose of this manual is to introduce the operation, components and settings of the smart flow meter electronic control.

FC-IOT electronic control is a metering control device based on Internet of Things technology. In addition to accurately measuring fuel volume, it can also upload refueling data to the cloud in real time, and supports actual data viewing, parameter modification, remote control, etc. on mobile phones and web pages.

Electronic control composition:

- FC-IOT smart Flow Meter Main Board
- FC-IOT smart flow meter display panel
- FC-IOT smart flow meter keyboard membrane
- FC-IOT smart flow meter safety grid
- 4G-DTU module

Display prompt code:



Serial number	Prompt	Illustrate
1	Start up	Indicates raise status
2	Stop	Indicates filling stop, standby state
3	No gun attached	Indicates that filling is stopped, but the gun is not positioned properly.
4	APP	Indicates that in APP replenishment mode
5	Sale	Indicates the preset amount
6	Lift	Indicates preset oil volume
7	Fail	Failed to enter APP password
8	Balance	Display the balance in the APP account
9	Online	Connected to Joyfueling
10	Liquid level	None
11	Success	None

About the display range:

The display range of this machine is

Oil volume: 000000.00 - 999999.00 liters

Amount: 000000.00 - 999999.00 Currency

The refueling control range of this machine is (taking into account the overshoot of the solenoid valve)

Oil volume: 0.10 – (999999.00/unit price) liter

Amount: (0.1*unit price) - 999999.00 Currency

The maximum refueling capacity is limited by the maximum of the two.

When the unit price is 2.00 Currency, the maximum refueling volume is $999999.00/5.00=499999.5$ (liters).

The minimum refueling volume is 0.1 liter.

1.2. Features

1. Multiple filling modes: cash filling mode, App filling mode, IC card filling mode;
2. Fixed number of liters, fixed amount of filling, random filling, and rounded filling make filling self-service, improve work efficiency, and reduce the labor intensity of filling station staff.
3. IC card payment/fueling are fast and reliable: convenient, fast and safe, no change is required, and it is convenient to manage the filling station.
4. Real-time monitoring function: supports wireless data upload and real-time monitoring of the working status of the filling machine.
5. Safe automatic offline function: When an unexpected situation or other failure occurs in the network, it can work offline, perform filling work and save transaction data by itself: when the network system is restored, it will automatically return to online working status.
6. Recharge on the mobile phone and upgrade the program remotely.
7. Automation of information collection: Use a complete management system to automatically collect transaction data, fundamentally eliminating the disadvantages of manual management, improving management levels, and optimizing the overall image.
8. Dual-platform management of skid installation settings on the computer and mobile terminals.
9. Matching 4-20mA liquid level probe, liquid level data is directly uploaded to the center.
10. Local parameters: basic parameters
 - 10.1 unit price setting range: 0.01-999.99 Sale/L (Sale/kg).
 - 10.2 Preset range: 0.1 ~ (999999.00/unit price) L, or (0.1*unit price) ~ 999999.00 Sale
 - 10.3 Single counting range: 8 digits (including two decimal places).
 - 10.4 class cumulative number range: 10 digits (including two decimal places).
 - 10.5 Total cumulative number range: 12 digits (including two decimal places).
 - 10.6 Rated current: < 1A
 - 10.7 Explosion-proof mark: Ex db ib II B T4 Gb 11) working conditions.
11. The controller should work normally under the following environmental conditions:
 - 11.1 Working temperature: (-20~+40) °C.
 - 11.2 Relative humidity: 20% ~ 95%.
 - 11.3 Power supply: Voltage: 12-24VDC
 - 11.4 Ambient air pressure : The ambient atmospheric pressure of the installation site is (80-110) kPa.

1.3. Electronic Components Description

1.3.1. Button definition

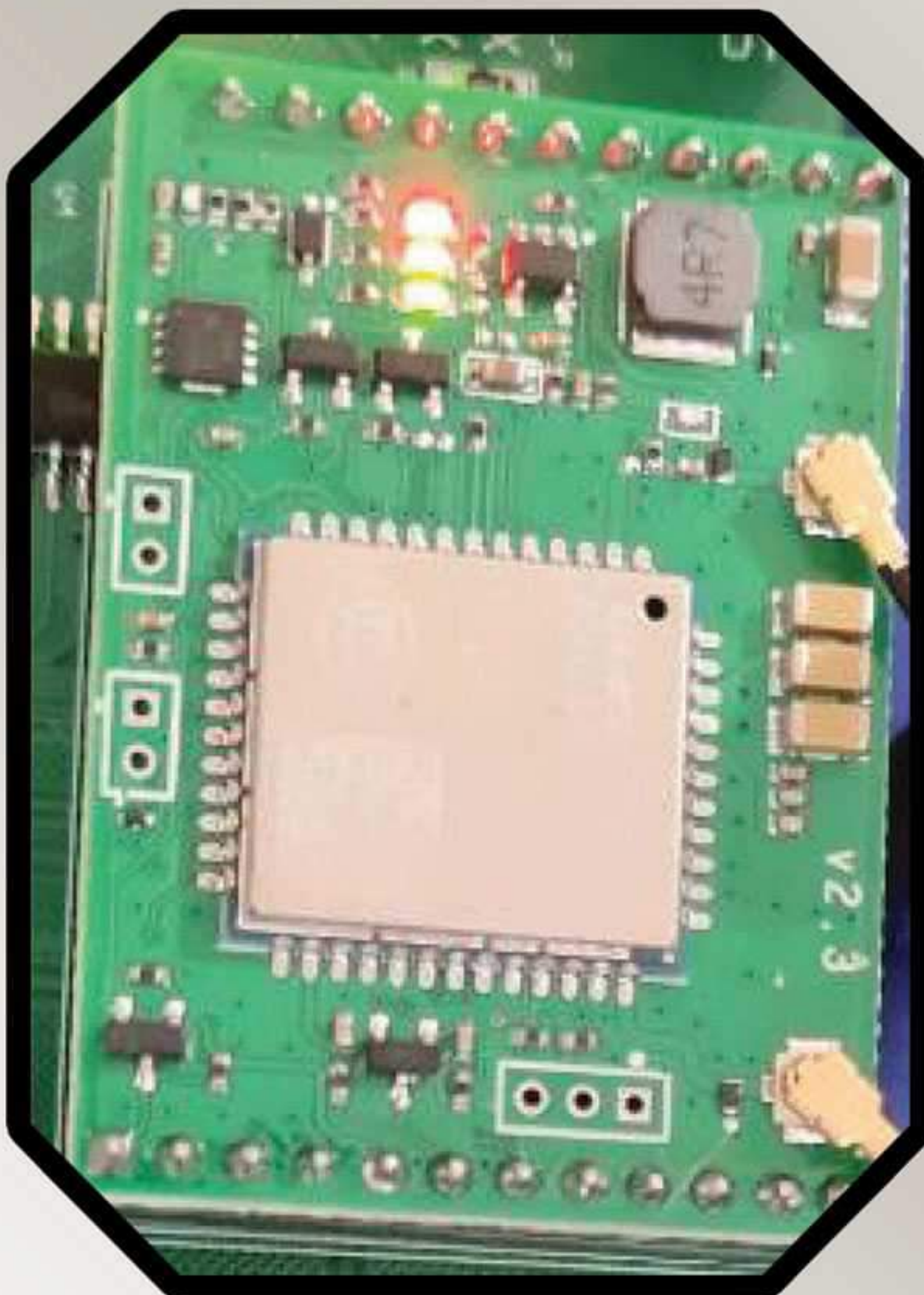
1. Daily Total
 2. Monthly Total
 3. Total (Total Accumulated Flow)
 4. Shift Total
 5. Details (Detailed List Per Transaction)
 6. Time
 7. #
 8. P1 (Press While Fueling to Check instantaneous Flow Rate)
 9. *
- F1. Press 3 Seconds to Print Per Transaction
F2. Check K Factor
App. (Dot Point for Decimals)
Set. to Go for "F" Menus
Inquiry. Press Inquiry then 1-5 For Transaction Details
Clear. Cancel
Confirm. Confirm Parameter for Every Settings
Preset/L. Preset with Liter Quantity
Preset/S. Preset with Total Sale Price
Stop. Stop Fueling
Start. Start Fueling



2. Configuration

2.1. 4G traffic card installation

The 4G traffic card is installed in the card slot of the 4G module, and each 4G module is equipped with one traffic card .



3. Electrical Connections

3.1. Power supply, solenoid valve, motor connection

- 1) The electronic control input voltage of FC-IOT smart flow meter is AC DC12 V.

4. How to Operate

4.1. Raise mode

Internet of Things electronic control can be divided into cash filling mode, APP filling mode and IC card filling mode. Each mode allows for free raises and preset raises.

Note: Cash replenishment requires the controller to be configured in local mode. You can also replenish the cash when not online. It can save 20,000 offline records and automatically upload them to Website Cloud System after being connected to the Internet.

In local mode and the controller is connected to the Internet, APP filling and IC card filling operations can also be performed. In non-local mode and the controller is connected to the Internet, only APP filling or IC card filling can be performed.

4.1.1. Cash mode

- **Any raise**

Steps:

- 1) After pressing the "Start" key or lifting the gun, the filling is started. The main screen displays the current filling amount, filling liters and unit price in real time, and the word "Start" is displayed in the lower left corner of the display.
- 2) Press the "Stop" key or hang up the gun to stop filling, and the word "Stop" will be displayed in the lower left corner of the display.

- **Preset raise**

Steps:

- 1) Press the "Preset Up" key to select the preset up filling mode, and the main screen displays "Up";
- 2) Enter the number of liters to be preset;
- 3) Press the "Start" button or lift the gun to start filling, and it will automatically stop after reaching the preset value.

Note: The minimum preset volume is 0.1 liters and the maximum value is 999999.00.

- **Add preset amount**

Steps:

- 1) Press the "Preset S" key to select the preset amount filling mode, and the main screen displays "S";
- 2) Enter the amount to be preset;
- 3) Press the "Start" button or lift the gun to start filling, and it will automatically stop after reaching the preset value.

Note: The minimum value of the preset amount is $0.1 \times \text{unit price}$, and the maximum value is 999999.00.

- **Amount rounding operation**

In order to facilitate settlement, during the filling process (whether it is random filling or preset filling), you can press the round key to stop filling. At this time, when the filling amount reaches the next integer amount, it will automatically stop.

Steps:

- 1) Lift the gun to start filling;
- 2) Close the filling gun without stopping;
- 3) Press the "Preset S/Rounding" key to enable the rounding function;
- 4) The filling gun will automatically stop when it reaches the next whole amount

- **Print receipt operation**

Steps:

- 1) In standby mode, when the printing function is turned on, press and hold the "Print" button
- 2) for 3 seconds to print the fuel filling data;
If automatic printing is turned on, the receipt will be printed automatically after the filling is completed.

4.1.2. IC card filling mode

In IC card mode, you can use M1 to store value, deduct money, and refuel. The M1 card can be used to store value on the mobile phone or the web. No change is required for gas payment, which is convenient for customers. The use range of the M1 card can also be limited to facilitate the management of subordinate gas stations. Transaction details can be checked on Website cloud system. Stored value details ensure clear consumption.

IC card mode usage process: pre-issue card → card allocation → stored value → refueling

- Pre-issuance of cards (the pre-issuance of cards is completed by company technicians, customers do not need to perform this step)
 - card allocation
 - Stored value
 - M1 card refueling operation
- 1) plug-in card;
 - 2) Enter the password set when assigning the card;
 - 3) After the balance is displayed, you can pick up the gun and refuel.

4.2. Data query operations

Operation steps: Press the "Query" key in standby mode to enter the query status, and " C " will be displayed in the unit price area of the display .

Note: The operating system will automatically exit if there is no key pressed within 5 seconds after entering the query state.

4.2.1. Amount rounding operation

Daily accumulation: used to query the total amount of filling data of the machine every day. (If there is no annotation data on a certain day, the data will be empty and automatically skipped during query.)

Steps:

- 1) Press the "Query" key to enter the query state;
- 2) Press the "Day Accumulation" button, the display will first display the day's date, and the unit price area will display "1" to indicate the serial number;
- 3) Press the "▼" key or "▲" key to select the query date. There is no need to select a date on the query day;
- 4) Press the "Confirm" button to check the daily accumulation, and the display will show the daily accumulation of the day;
- 5) It will automatically exit to standby mode after 5 seconds of daily accumulation.

4.2.2. Query monthly total

Monthly cumulative step: used to query the total monthly filling data of the machine. (If there is no annotation data for a certain month, the data will be empty and automatically skipped during query)

Operate:

- 1) Press the "Query" key to enter the query state;
- 2) Press the "Month Accumulation" key to query the data. The display will first display the day's date, and "1" in the unit price area indicates the first month's accumulation;
- 3) Press the "▼" key and "▲" key to select the month to be queried. There is no need to select the current month to query;
- 4) Press the "Time" key to query the cumulative month of the current month and the filling time of the last filling data;
- 5) Press the "Confirm" key to check the monthly total, and the display will show the current month's total;
- 6) It will automatically exit to standby mode after 5 seconds of monthly display.

4.2.3. Total Inquiries

Total: Query the sum of all the filling data of this machine.

Steps:

- 1) Press the "Query" key to enter the query state;
- 2) Press the "Total Accumulation" key to query the data, and the data is displayed on the second line of the main screen;
- 3) Press the "Preset Liter" key or "Preset S" key to switch between displaying the total refill liters or the total refill amount;
- 4) The total amount will be displayed for 5 seconds and then it will automatically exit to standby mode.

4.2.4. Query details

Detailed record: used to query the machine's latest 20,000 refill details, including refill amount and refill liters.

Steps:

- 1) Press the "Query" key to enter the query state;
- 2) Press the "Details" key to query the data. The replenishment amount is displayed on the first line, the replenishment liters are displayed on the second line, and the detailed serial number is displayed on the third line;
- 3) Press the "▼" and "▲" keys to switch to view other detailed data;
- 4) The detailed record will automatically exit to standby mode after 5 seconds.

4.2.5. Query local time

Steps:

- 1) Press the "Query" key to enter the query state;
- 2) Press the "Time" key to check the time, and the time will be displayed on the display panel.

4.2.6. Query the MAC code of this machine

Steps:

- 1) Press the "Query" key to enter the query state;
- 2) Press the "P1" key to check the MAC code, and the 20-digit MAC code will be displayed on the display panel.

Operation step 2 :

- 1) Press and hold the numeric key " 9 " , the 20-digit MAC code will be displayed on the display panel.

4.2.7. Query current flow rate

Steps:

- 1) When the tanker starts refueling ;
- 2) Press the "P1" key, and the current flow rate will be displayed on the unit price position of the display panel .

4.2.8. Query current signal strength

Steps:

- 1) Press the "Query" key to enter the query state;
- 2) Press the numeric key " 7 " to check the signal strength, and the signal strength value will be displayed on the display panel .

Note: The larger the displayed value, the better the signal strength.

4.3. System settings

In standby mode, you can set relevant parameters through the keyboard, and you need to enter a password to enter the settings.

operate:

- 1) In standby mode, press the "Settings" key to enter [Settings mode], and the main screen displays "F --";
- 2) Enter the parameter code (see parameter code table for details);
- 3) Enter password;
- 4) Enter new parameters and press the "Confirm" key to save the settings.

Parameter code table:

Serial number	Code	Function	Factory parameters
1	11	Print mode (first level password)	2
2	unit price	Set unit price (first level password)	unit price
3	12	Valve closing amount (first level password)	0.25
4	31	Time setting (secondary password)	current time
5	32	Ratio setting (secondary password)	0
6	33	Working mode (secondary password)	local
7	34	Pulse coefficient setting (secondary password)	2500
8	35	Flow rate compensation -pulse coefficient and valve closing amount setting (secondary password)	0
9	36	Flow speed compensation -flow speed gear setting (secondary password)	0
10	38	First-level password modification (first-level password)	123456
11	39	Secondary password modification (secondary password)	555555
12	40	Print oil product name selection (secondary password)	0
13	51	Number of refueling times (three-level password)	0

4.3.1. 【Unit Price】 Set the unit price

Steps:

- 1) In standby mode, long press the "Unit Price" key;
- 2) Enter the password, the default is 123456;
- 3) Enter the new unit price and press "Confirm" to save the settings;

Note: When connected to the Internet, the unit price in the background will automatically prevail

4.3.2. 【12】 Valve closing amount setting

Description: Set the oil price. Range: 0.01-999.99

Note: The valve closing amount in advance refers to the advance amount of the solenoid valve closing during preset filling. It is a parameter set to improve the accuracy of preset filling. Range 0.01-9.99.

Steps:

- 1) In standby mode, press the "Settings" key to enter [Settings mode], and the main screen displays "F --";
- 2) Enter parameter code 12;
- 3) Enter the password, the default is 123456;
- 4) Enter the valve closing amount, such as 9.99, and press the "Confirm" key to save the setting;

4.3.3. 【33】 Working mode setting

33 function parameter description:

- 1) When the first one from left to right is set to 0, it can be started locally. When it is set to non-0, it cannot be started locally. The default is 1 (one shot).
- 2) The second digit from left to right, when set to 0, it can be started locally. When it is set to non-0, it cannot be started locally. The default is 1 (second gun)
- 3) The third digit from left to right, when set to 1, uses a single-channel sensor and needs to be restarted. The default is 0 for the phase sensor.
- 4) The fourth digit from left to right, when set to 1, connect to the liquid level gauge, when set to 2, connect to the differential pressure gauge, the default is 0

The working mode is divided into two categories: local and non-local. The parameters have a total of 8 bits. The first bit from left to right is set to 0 for local mode, and set to non-0.

Operating Mode	Network	Illustrate
Local	Networking	Cash deposit, APP deposit, IC card deposit
Local	Not connected to the Internet	Cash raise
Non local	Networking	APP replenishment, IC card replenishment

Steps:

- 1) In standby mode, press the "Settings" key to enter [Settings mode], and the main screen displays "F --";
- 2) Enter parameter code 33;
- 3) Enter the password, the default is 555555;
- 4) Enter 00000000 (local mode) or 10000000 (non-local mode) and press the "Confirm" key to save the settings.

Note: The working mode parameters must be entered with all 8 digits. Even if it is 0, 00000000 must be entered.

4.3.4. 【 40 】 Select printing oil product name

Steps:

- 1) In standby mode, press the "Settings" key to enter [Settings mode], and the main screen displays "F --";
- 2) Enter parameter code 40 ;
- 3) Enter the password, the default is 555555;
- 4) Enter the corresponding code of the oil product.
- 5) Press "Confirm" key to save parameters.

Note: When printing the oil name, select 0: Empty 1: Gasoline 2: Diesel.

5. Frequently Asked Questions and Solutions

Common Fault Phenomena	Information Reason	Solution
1. Tip: E01	No sensor or sensor failure	Replace sensor
2. Tip: E04	Time lock	Background correction
3. Tip: E05	Refueling frequency lock machine	Modify settings in refueling
4. W01	Clock battery error	Change the time
5. W02	Preset value error	Reset preset values
6. W03	Shutdown if no oil is produced	Automatic recovery
7. EE 01	Insufficient balance	Top up the card
8. EE 02	Single liter limit	Modify limits or start again
9. EE 03	Daily amount limit	Modify the limit or try again the next day
10. EE 04	Daily liter limit	Modify the limit or try again the next day
11. EE 05	Monthly amount limit	Modify the limit or try again the next day
12. EE 06	Monthly liter limit	Modify the limit or try again the next day
13. EE 07	Device time expires	Scan the QR code to activate the payment in the background
14. EE 08	Daily limit/Non-group m 1 card	Backstage settings/change cards
15. EE 09	Invalid Code	Enter new APP code
16. EE 0	Equipment abnormality	Contact after-sales staff

6. After-sales Service

- 1) The product warranty period is one year, and long-term maintenance is provided.
- 2) The warranty period starts from the date the product installation and debugging is completed.
- 3) Before using the product and when encountering problems, please read this manual carefully or call our company.
- 4) Due to product damage caused by natural forces, force majeure and man-made damage, our company provides paid services