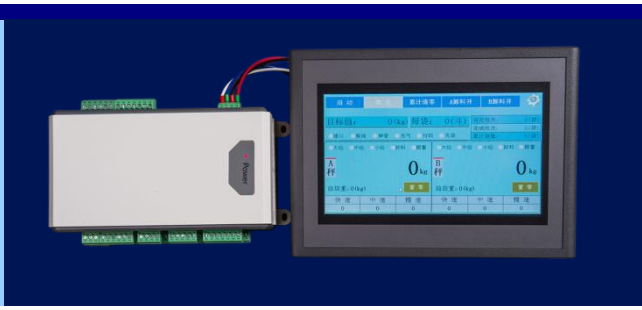
Multifunctional programmable weighing controller

DS822-A8MTF(4421)

operation instruction

DINGSONG



(Chinese version V1.1.2)

Hangzhou dingsong automatic control equipment co., ltd

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Catalog

I. Introduction

DS822-A8MTF(AX00) is a split programmable weighing controller connected with digital sensors. The host is installed with standard guide rail, which can be directly connected to the touch screen as man-machine interface, or connected to the display panel produced by our company. This controller has the characteristics of multifunction, high precision, high reliability and user programmability.

Figure 1.1 Physical drawing of main engine and man-machine interface accessories

Hardware resources and functions

(1) 6 common switch input points, which can receive the following signals:
Passive switch, button and relay output
NPN or PNP transistor switch input
DC voltage signal, voltage range 6-24 V

(2) 4 relay outputs, contact capacity: AC220V, 5A or dc30v, 5A

(3) 2-channel OC gate output, (outa, outb corresponding to output 6 and 7)

(4) One channel 485 communication sensor interface can connect 16 digital sensors

(5) Two channels of 4-20mA analog output and one channel of 4-20mA analog input

(6) Two way communication interface (integrated instrument only has one communication interface)

One channel can be connected with RS485 / RS232 signals. It can be used to communicate with computer, PLC, etc

The other is RS485 interface, which is fixed to the standard Modbus RTU protocol with a baud rate of 38400. It can be connected to the display panel produced by our company or touch screen of other brands (only the split type has this interface)

(7) 1 channel large screen output interface (multiplexed with OC gate output port outb, only one function can be selected at the same time)

It can connect 1 to 2 large screen displays produced by our company

(8) Flexible and reliable programmable function, adapt to a variety of applications, users can carry out secondary programming, can be easily completed

At the same time, it can protect users' intellectual property rights

Main performance indicators

(1) Power supply voltage: DC24V（16～32V）

(8) Service temperature: -10℃～40℃

(3) Storage and transportation temperature: -65℃～+150℃

(4) Relative humidity: < 90%

(5) Number of sensors connected: Up to 16

(6) Sensor power supply: DC12V (current > 400mA)

(10) Overall dimension of main engine: 176 × 85 × 71

(11) Dimension of display panel: 160 × 85 × 30

2.1 Installation Dimension Drawing of Host

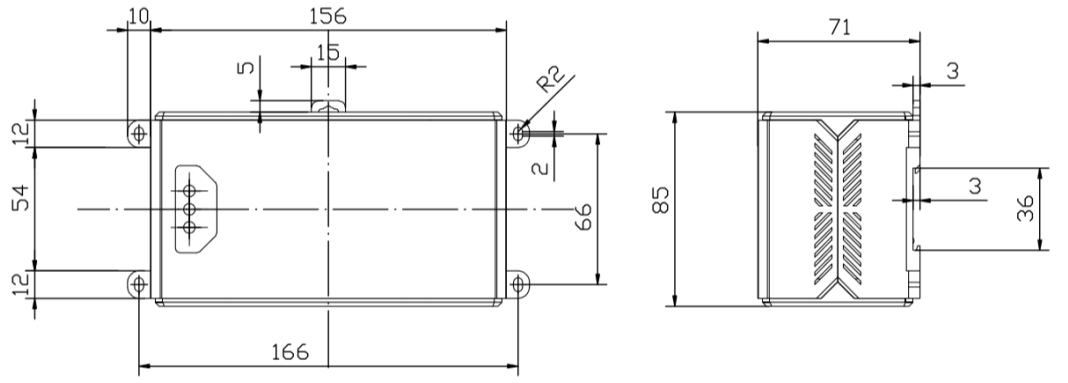


Figure 2.1 Installation Dimensions of Host

2.2 Installation dimension drawing of display panel

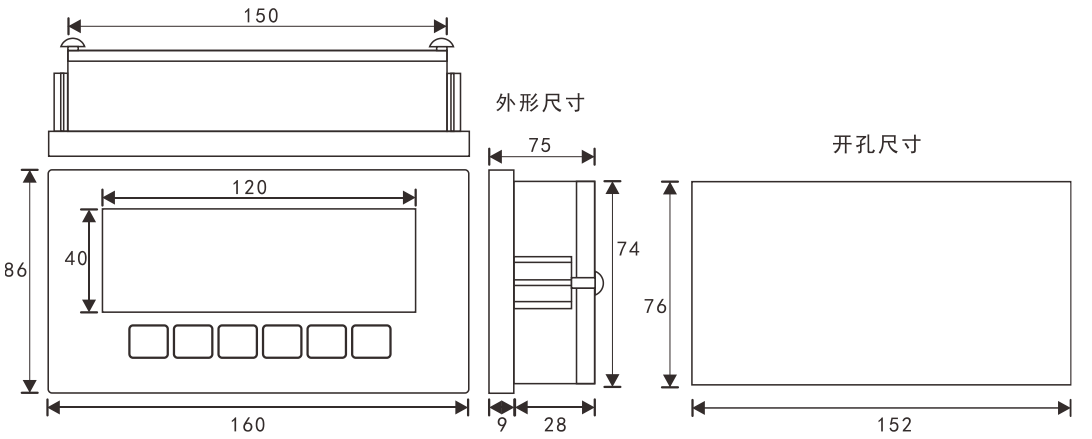


Fig. 2.2 Installation dimension diagram of display panel

2.3 Installation dimension drawing of touch screen (7 inches)

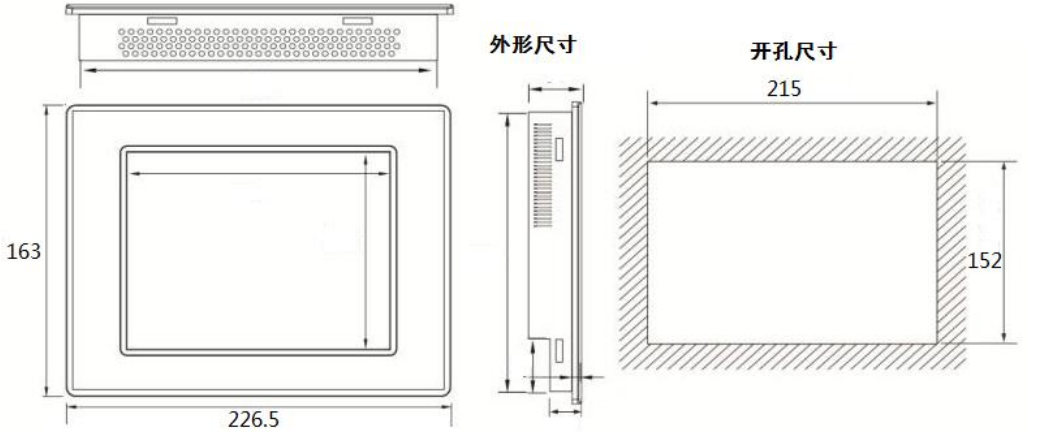


Figure 2.3 Installation Dimensions of Touch Screen

III. Interface Layout of Host and Accessories

3.1 Interface layout of instrument host

The terminals of the host are distributed on the AB surfaces of the upper and lower sides, the A surface is the display and switch input interface, and the B surface is distributed with other interfaces, such as switch output port, power input port, high-speed pulse input port, load cell interface, full-function communication port, etc.

3.1.1 Surface A of instrument host panel

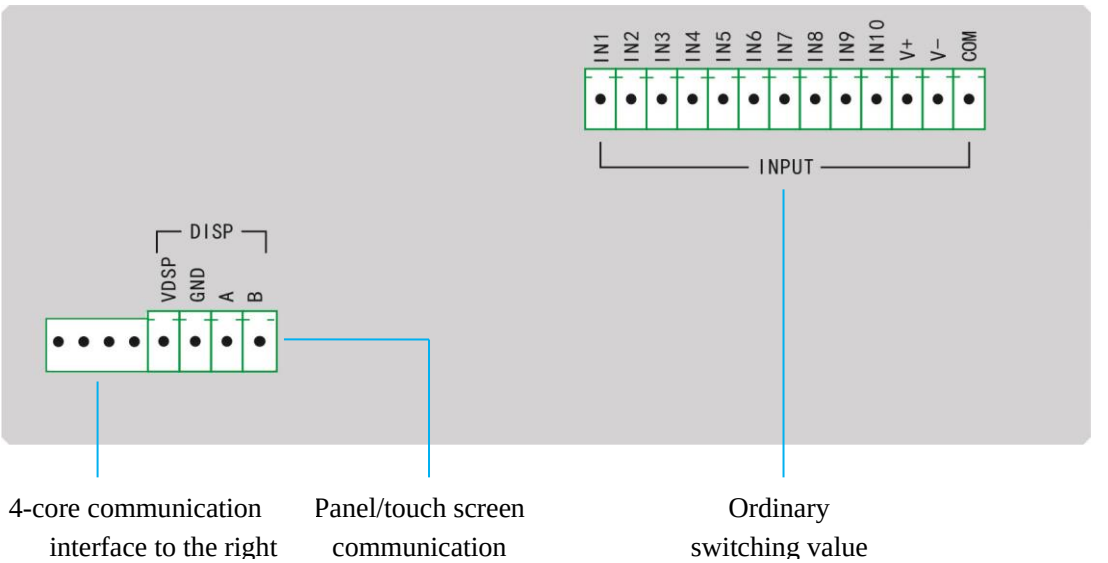


Figure 3.1 Functional Schematic Diagram of Panel A of Host

3.1.2 B side of instrument host panel

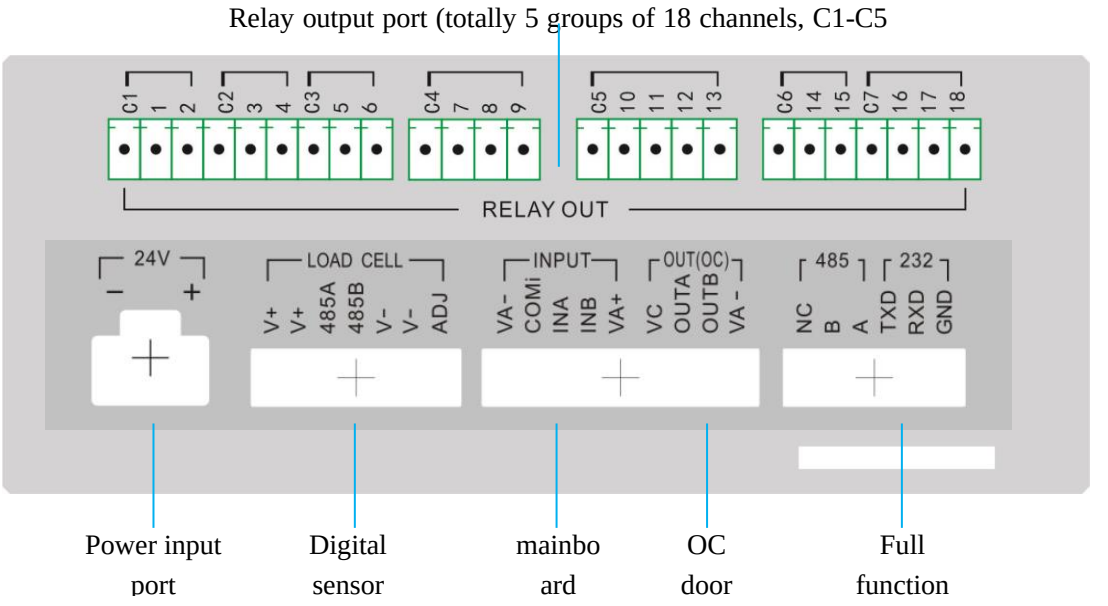


Figure 3.2 Functional Schematic Diagram of B Side of Host Panel

3.2 Display panel function layout

The host computer can be connected to the display panel produced by our company as a man-machine interface. The display panel is double-row digital tube display with six independent setting buttons. Two stable indicators, two rows of input and output indicators.

3.2.1 Display panel (front)

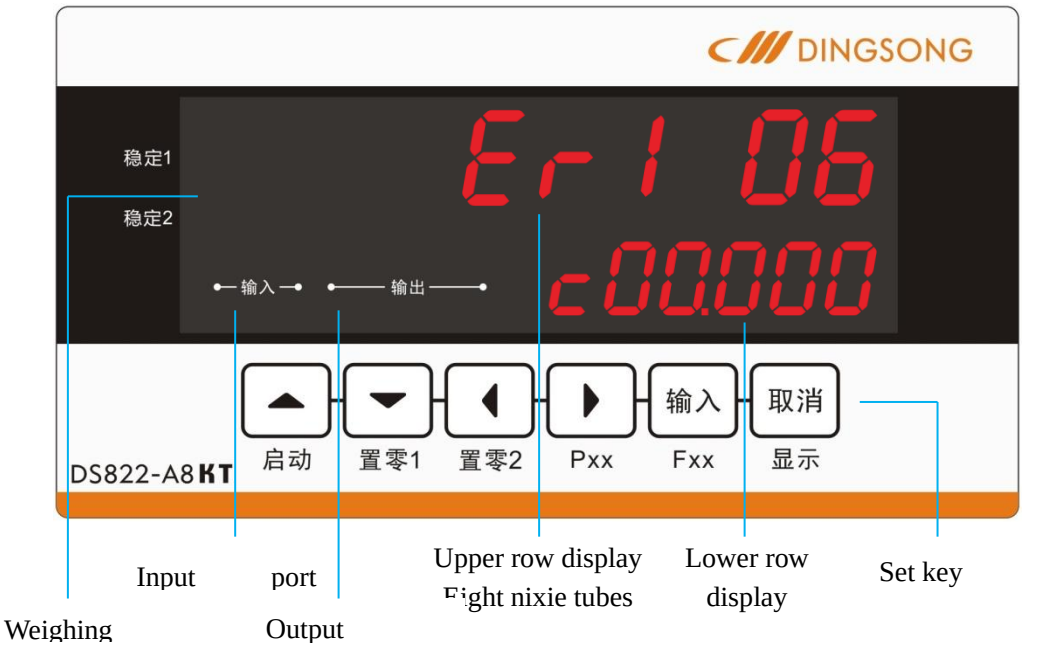


Figure 3.3 Functional diagram of display panel (front)

3.2.2 Display panel (back)

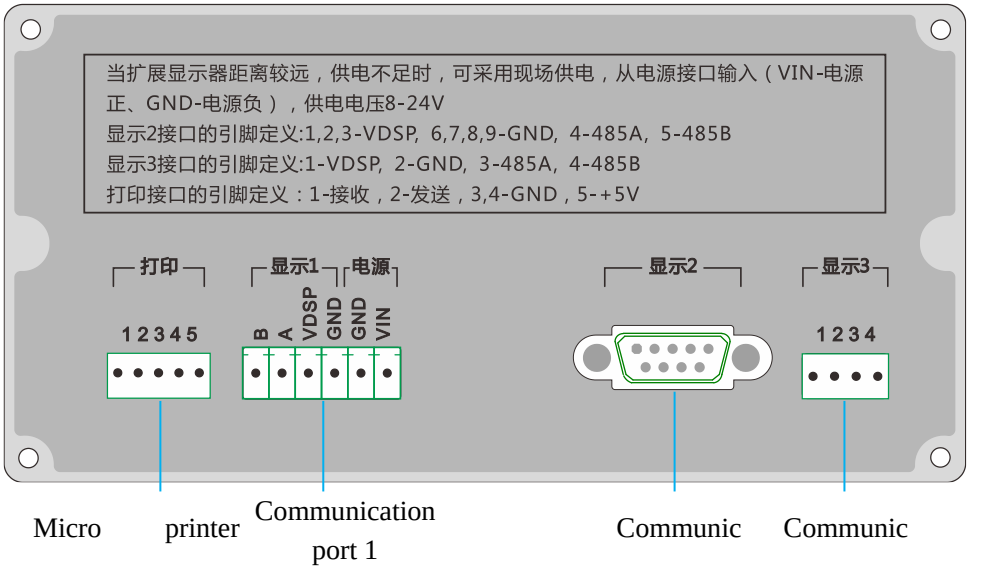


Figure 3.4 Functional diagram of display panel (back)

Note: The functions of the three display communication ports are completely equivalent. One communication cable comes from the factory, and its two ends are connected to the left side of the display 3 interface of the display panel and the host DISP interface respectively, so there is no need for users to connect wires themselves. Users can also choose the appropriate interface to connect themselves.

IV. Connection method of instrument port

4.1 Connection method of common switch input port

input	Optocoupler isolation switching value	This instrument has 10 common switch inputs (IN1-IN10), and the common terminal COM is not connected to any electrical node inside the instrument. At the same time, a positive power supply (+V) and a negative power supply (-V) are led out inside, so the common terminal can be connected to +V or -V or not according to different needs. Each input port can be connected with a button, a trigger switch, a relay contact point, a proximity switch, etc. You can also input a DC voltage signal (6-24V). See the following figure for specific common connections.

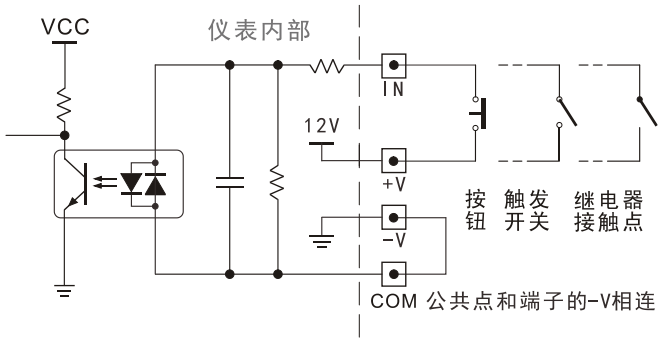
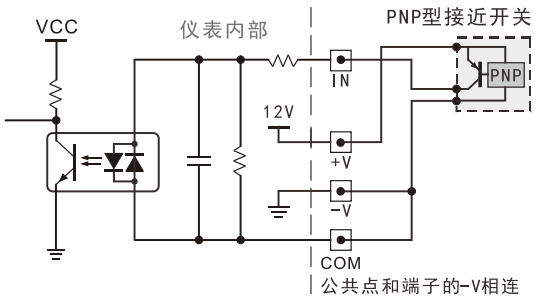


Figure 4.1 Schematic diagram of switch input connection

Note: The common point COM in the figure can also be connected with+V. At this time, one end of the button should be connected with-V. You can choose different connection methods according to your needs.



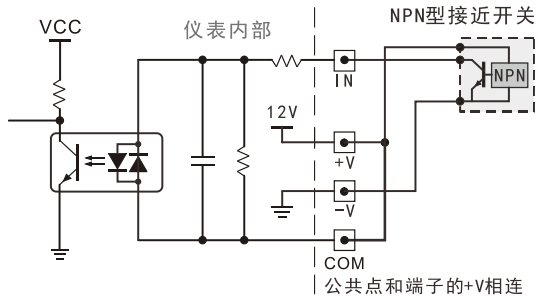


Figure 4.2 Schematic diagram of PNP proximity switch connection Figure 4.3

Schematic diagram of NPN proximity switch connection

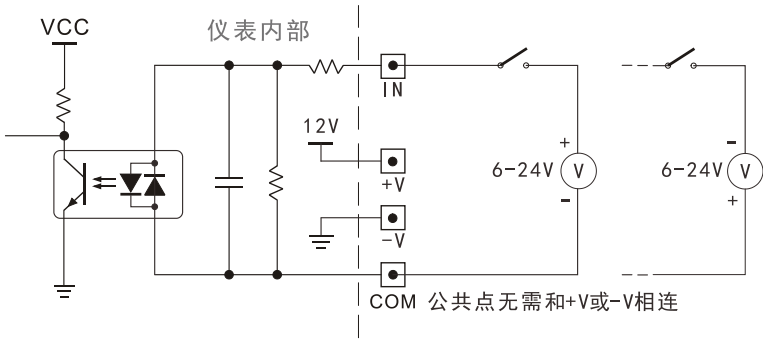


Figure 4.4 Schematic diagram of DC voltage signal input connection

4.2 Connection method of switch output port

output	relay	A total of 18 output (1-18), contact capacity: AC220V / dc30v, 5A. It can be directly connected with small power resistive load and low power AC / DC inductive load (such as AC contactor and DC contactor). The wiring method is shown in the figure below. When the instrument is connected in series, please prevent damage

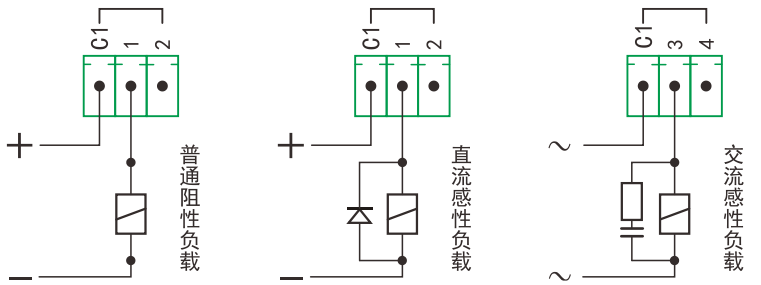
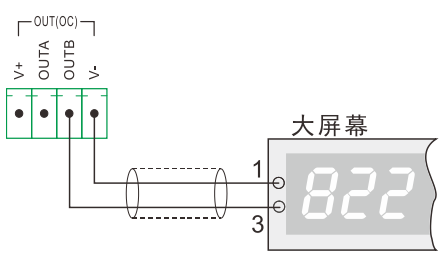


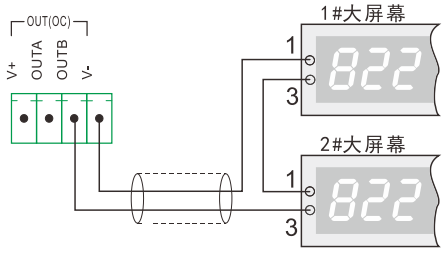
Figure 4.5 schematic diagram of relay output connection

4.3 transistor OC gate connected to large screen display

output	Communication loop current	This instrument can be connected with 1 to 2 large screen displays. It should be noted that the interface is multiplexed with the OC gate output port, and only one function can be selected at the same time. To use this function, the parameter f37 must be set first. See Section 7.3 for details



连接1个大屏幕



连接2个大屏幕

Figure 4.7 connection diagram of large screen display

Note: two large screens can also be connected in parallel, as shown in the figure on the left

4.4 Connection method of load cell

The sensor interface of this instrument is RS485 communication port.If the power supply is 12V and the driving current is more than 400mA, 16 digital sensors can be connected. If adj and v-short circuit are used, the power supply voltage of the sensor can be increased to adapt to the longer connection distance.

4.4.1 label and function of load cell interface

Serial number	grade	Corresponding function
1	V+	Sensor positive supply
2	V+	Sensor positive supply
3	485A	485A
4	485B	485B
5	V-	Negative sensor supply
6	V-	Negative sensor supply
7	ADJ	If the adj and v-short circuit can improve the supply voltage of the sensor

Table 4.1 interface label and function of load cell

4.5 Connection method of communication interface

asSection 3.1As shown in the interface layout of the instrument host, there is a communication port on both sides of a and B of the instrument host.

1#通信口:RS485　　2#通信口:RS232+RS485

Figure 4.10 schematic diagram of two communication interfaces of instrument

The 1 communication port of a side is RS485 interface, fixed to standard Modbus RTU protocol, with baud rate of 38400. It can be directly connected (without any setting) to the display panel produced by our company or the touch screen sold by our company.

The 2 communication port of side B is a full-function communication port compatible with RS485 and RS232 at the same time. The communication mode, address and baud rate can be set. Top loose protocol, standard Modbus RTU protocol and multiple continuous transmission modes are optional. It can communicate with

computers, PLC and other equipment.

Note 1: when the 2 g communication port is set to Modbus RTU protocol, the functions realized by the same communication port are exactly the same.

Note 2: 2. The first interface NC on the left side of the communication port is not connected with any electrical nodes and is only used in special occasions.

4.5.1 connection method between host and display panel

There are also two connections to the host display panel. The first one supplies power to the host, as shown in connection 1 below. If the distance between the display panel and the host computer is far, connection 2 can be adopted at this time, and the external power supply is used, and the power supply voltage is 8-12V DC.

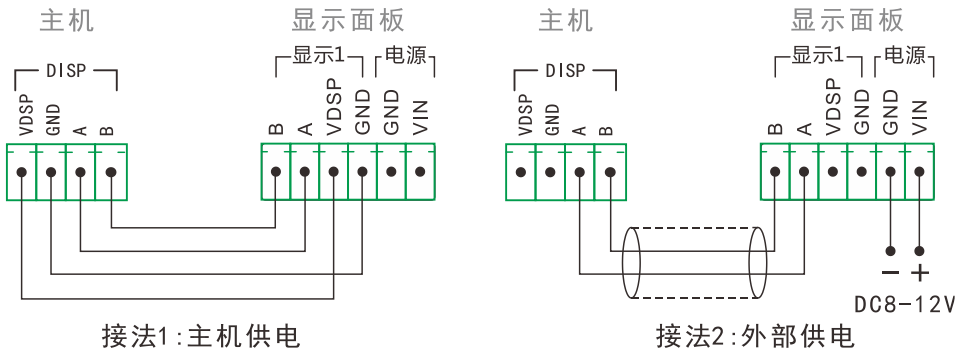


Fig. 4.11 Connection Method between Host and Display Panel

4.5.2 Connection method between host and touch screen

The instrument can directly supply power to the touch screen, or it can be externally supplied if the distance between the touch screen and the host is far. Please refer to the relevant information of the touch screen for the power supply voltage range and connection method.

V. Parameter setting

5.1 Function and operation of setting buttons on the display panel

asFigure 3.3As you can see, there are 6 independent setting buttons on the display panel. Each button has two names and performs different functions in different situations. Each key has two operations: short press and long press. When a key is pressed, the buzzer will sound short, and then releasing the key is short press. If you press and hold a key for more than 2 seconds, It is a long

press when the buzzer is released after a long sound. If it is still not released at this time, it will enter the button continuous operation mode. The functions of the six setting buttons are as follows:

Serial number	Key diagram	Key name	function	remarks
1		【↑】	Set the current menu item to flip up. Set the target number plus 1	
		[start]	Start the selected process Press long to indicate [Stop] to exit the process.	See relevant process information for details.
2		【↓】	Set the current menu item to flip down. Set the target number minus 1.	
		[Set to zero 1]	1# scale is set to zero or calibrated to zero.	See. 8.3Section/6.1festival
3		【←】	Set the currently selected number to move left.	
		[zero 2]	2. Zero setting or calibration of scale Long press to clear the accumulated quantity	See. 6.1festival See. 8.3festival
4		【→】	Sets the currently selected number to move to the right	
		【Pxx】	Press p to enter parameter setting	See. Section 5.5
5		[input]	Confirm the current parameter setting	
		【Fxx】	Press and hold to enter f parameter setting	See. Section 5.4
6		[cancelled]	Exit current parameter setting	
		[display]	Press and hold to display the secondary display	See section 7.5 for details

Table 5.1 function description of display panel setting key

Note: description of display and setting key operation

(1) The parameter setting in this chapter refers to the operation on the display

panel produced by our company. Please refer to the instructions for touch screen operation

(2) "Weighing display status" in this chapter refers to the default state that no menu is entered after the instrument is powered on

(3) The key operations in this chapter are represented by square brackets and key names, such as: [input], [Pxx]

If there is no special description, key operation refers to short press, if it is long press, it will be marked, such as long press [FXX]

(3) The corresponding contents are shown in brackets in [[010]

(4) Display panel digital tube display comparison table

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	R	S	T	U	Y

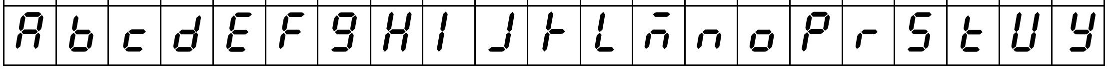


Table 5.2 comparison table of digital tube display on display panel

5.2 Introduction of instrument parameters

The instrument has two groups of parameters: f parameter and P parameter. The meaning of f parameter is fixed, which is the internal working parameter and operation item of the instrument. For details, seeSection 5.5.2. The P parameter corresponds to the variables of the instrument workflow, and its visibility, password control and corresponding meaning are all determined by the workflow. See the corresponding workflow data for details.

Press and hold the [Fxx] key for viewing and setting F parameters, and press and hold the [Pxx] key for viewing and setting P parameters. See the introduction of the following sections for specific operation methods.

5.3 Password control and permitted operation items

This instrument is controlled by password. After the instrument is powered on, the initial state is no login. Some operations of this instrument can only be carried out after logging in with corresponding passwords. There are three levels of passwords, namely, user (User-1), administrator (User-2) and manufacturer (User-3). You can operate the corresponding functions by logging in with different passwords, and the privilege levels of these three passwords increase in turn.The operation items that allow password login at this level also increase in turn. See the following table for details:

Serial number	Operation item	Login password level			
		No login	user	administrator	factory
1	Zero and tare operations	√	√	√	√
2	And view and modify non-regulatory p parameters.	√	√	√	√
3	And view and modify control p parameters.	×	√	√	√

4	View and modify f parameters	×	√	√	√
5	Check the second display content.	×	√	√	√
6	Weighing	×	√	√	√
7	Process start and stop	×	√	√	√
8	Initialize instrument	×	√	√	√
9	Set a timed shutdown.	×	×	√	√
10	Setting input and output ports	×	×	√	√
11	Consistency calibration	×	×	×	√

Table 5.3 Comparison of Password Levels and Operating Items

Note: √ indicates the permitted operation items under password login at this level, and × indicates the impermissible operation items.

Note: Some items are realized by F parameter, and the corresponding parameters can only be displayed after logging in the password of this level.

Note: If the highest bit of F parameter F22 is set to 0 (the factory default value is 1), the user's (User-1) level permission will be automatically obtained without login, that is, the items marked orange × in the above table can be operated without login.

5.4 Operation steps of password login

The specific operation steps of password login are as follows:

button	Lower row display	Upper row display	meaning
【Fxx】	[F00]	[PP-----]	In the weighing display state, press and hold the [Fxx] key for a long time, and the lower row will flash. If you have logged in, the lower row displays [F01]. If you need to switch the login level, you can press the 【↓ 】 key and select the parameter F00. If you enter the current password again, you will enter the password change function. See Section 7.5 for details.
[input]	[F00]	[PP-----]	The top row flashes the rightmost digit.
direction key	[F00]	[PP----1]	Enter the corresponding password, factory default value: user password [-1], administrator password [59565], manufacturer password, dynamic uncertainty.

[input]	[F00]	[USEr-1]	According to the unused password, the corresponding login prompt is displayed, which indicates that the login is successful. If the input password is wrong, [,err,,] will be displayed, and after 1 second, it will automatically exit and enter the weighing display state.

Table 5.4 Specific Operation Steps of Password Login

Note: After the power is turned on again, you will automatically log out of the login state. If you need to operate the corresponding items again, you need to log in again. If you need to log out of the logged-in state, you can also take the initiative to power off and restart the instrument.

Note: The password of the manufacturer (User-3) is dynamic. If necessary, please contact us for information.

5.5 F parameter setting and lookup table

5.5.1 Step of parameter setting

(1) in the weighing display state, according to theSection 5.4Introduce the method of login (skip this step if you have already logged in).

(2) Press and hold the [Fxx] key for about 2 seconds, and the lower row of the instrument will display [F01] and the upper row will display [D, ＊＊＊]. You can select different parameters by pressing the [↑] [↓] key to operate, and the lower row will display the current F parameter number in a flash.

(3) After the corresponding parameters are selected, press the [Enter] key again to enter the corresponding parameter modification operation. At this time, the lower row does not blink, but the parameter content in the upper row blinks, which can be modified by the four keys [←] [→].

(4) After the modification, press [Enter] to confirm the completion of the setting, and press [Cancel] to abandon the current item setting and exit to the previous menu.

Note: For some parameters, users can completely enter their own set values, while for others, they can only select the built-in fixed parameters through [↑] [↓], and users can judge whether the parameter values displayed in the upper row are flashing or not.

5.5.2 F parameter table

Lower row display	Upper row display	meaning
[F00]	[PP -----]	Prompt for login password, see section 5.4 for details.

[F01]	[d 010]	Grading value (01,02,05,10,20,50,100 optional)
[F02]	[P 0]	If the number of decimal places (0-4 optional) of the weight exceeds, the error code [Error ,08] will be displayed.
[F03]	[30090]	The full-scale value of the scale (factory default value: [,,030090])
[F04]	[r-o X.Y]	0-cAnnot bESEt toZEro 1-1%2-2%3-5%4-10% 5-20% 6-50% ≥7-100% X-AUto-ZEroIn9 rAn9E At PoYEr-on (PErcEntA9E oFt HE FULL-ScALE uALUEoFt HEScALE) Y-tEY ZEro SEttIn9 rAn9E (PErcEnt A9E oF t HE FULL ScALE uALUE oF t HEScALE) For example, setting it to "2.5" means that the range of automatic zero setting at power-on is 2%, and the range of key zero setting is 20%. The factory default setting is "1.1"
[F05]	[r-A 0.5]	Zero tracking range (set range 0.0~9.9 division values)
[F06]	[ñodE 02]	See section 7.1 for communication mode.
[F07]	[Adr 01]	Mailing address (1-26 optional), which indicates that the content to be sent is selected in continuous sending mode.

Quick Table of Group Parameters (Continued 1)

Lower row display	Upper row display	meaning
[F08]	[038400]	2# baud rate of communication port (600, 1200, 1800, 2400, 4800, 9600, 19200, 38400, 57600, 115200 optional)
[F09]	[FLt 0.0]	1# scale filter coefficient (0-9 optional, the bigger the number, the deeper the filter) Press [Enter] to display [FLT-2, 0], 2 # scale filter coefficient. Press [Enter], and [uint ,00.0] will be displayed. This parameter is reserved.
[F10]	[rt 0.2]	Judgment time (it is recommended to set it to 1.0 seconds)
[F11]	[rF 01]	Judging range (it is recommended to set it to 1) The larger the value, the more unstable the weighing, such as livestock scale.
[F12]	[cAL-1]	Weighing (see chapter 6 calibration method for details)

[F13]	[tSt-cELL]	Test the sensor output signal and press [Enter]: The lower row shows the sensor number [c01] The upper row displays the sensor output code or error message [＊＊＊＊]. Use [←] [→] key to cut the sensor display.	
[F14]	[tESt-dSP]	Display test	See section 8.1 for details.
[F15]	[o-000000]	Test outlet	
[F16]	[tSt-PSUL]	Test pulse input port	
[F17]	[d **.**.**]	Current date	
[F18]	[t **.**.**]	present time	
[F19]	[LInE **]	Set the workflow number (factory default 00 means none) 1-14 the fixed process listed in the corresponding specification. No.15 is an empty process. Note: No.1-6 is the instrument fixing process, which cannot be modified. No.7-15 can receive the user-written process through serial port. Please refer to relevant process information for details.	
[F20]	[dSP1 ***]	In the weighing state, the contents displayed on the upper row of the display panel are displayed. Press [Enter] to display [KP1, ＊＊＊], which indicates the content displayed in the lower row. See section 7.5 for details	
[F21]	[dSP2 ***]	In the weighing state, the contents displayed in the lower row of the display panel are displayed. Press [Enter] to display [KP2, ＊＊＊], which indicates the content displayed in the lower row. See section 7.4 for details.	
[F22]	[LH *****]	[LH AbcdE] A: select the method of obtaining user (User-1) level permission. (1) short circuit (NC) and (RXD) of the main serial port, (0) password login. B: Whether it is allowed to set the formula number (0- not allowed, 1- allowed), please refer to relevant information. E:(1) Clear the cumulative control, (2) Automatically compensate for temperature drift or creep.	
[F23]	[A-oUt 1]	Set and adjust 1# analog output port, see section 7.4 for details.	
[F24]	[A-oUt 2]	Set and adjust 2# analog output port, the operation is the same as above.	
[F25]	[A-In]	Set and adjust analog input port, see section 7.5 for details.	
[F26]	[tSt- rAM]	Test RAM, see section 8.1 for details.	

Quick Table of Group Parameters (Continued 2)

Lower row display	Upper row display	meaning	
[F27]	[no]	Non-instrument function	
[F28]	[SSIo --]	See section 8.1 for the test port.	
[F29]	[A8**]	Display version number, and display other related contents in the input order.	
[F30]	[r-cAL]	See the calibration result (calibration coefficient of each sensor), see section 6.2 for details.	
[F31]	[InIt 0]	Used to initialize the instrument, see Section 8.5 for details.	
[F32]	[d-oF]	Special functions (such as input and output position adjustment, etc.)	See section 7.6 for details.
[F34]	[tSt- bcd]	(only for instruments with BCD output) Press the key to display [b-H *], set to 0:bcd code output, Set to 1: binary code output, and set to 2: bcd code reverse output. Set to 3: the binary code is output in reverse. Press enter again and display [bcd **] to enter bcd code output self-test.	
[F36]	[Pro9]	Enter process No.6 manually. If you need this function, please contact us for details.	
[F37]	[rdP1 000]	1# big screen output content Press [Enter] to display [rdP2 000], and set the output content of 2# large screen. The factory default is 0, which means there is no output. See Section 7.2 for details.	

Table 5.5 F Parameter Quick Table

5.5 P parameter setting

Follow the following steps to enter the P parameter setting:

(1) Press and hold the [Pxx] key for about 2 seconds, and the lower row of the instrument will display [P**] and the upper row will display [,* * *] (the specific content will be determined according to the process). You can select different parameters by pressing [↑ ↑

(2) After the corresponding P parameter is selected, press the [Enter] key again to enter the corresponding parameter modification operation. At this time, the lower row does not flash, but the parameter content in the upper row flashes, which can be modified by the four keys [←] [→].

(3) After the modification, press the [Enter] key to confirm the completion of the setting, or press [Cancel] to abandon the setting of the current item and exit the previous menu.

Note: Some parameters are set as control parameters by the process, so you need to followSection 5.4This paper introduces the method of logging in first, and if you have logged in, you will automatically display all the P parameters that can be set.

Note: Please refer to the corresponding process data for the specific meaning of P parameter.

VI. Weighing and calibration of instruments

When this instrument is used for the first time, or after a period of use, the weighing error is large, so it is necessary to carry out weighing calibration. This instrument can be calibrated in kind, and in some cases where physical calibration is not possible, it can be calibrated by calculation method. If it is the first calibration, the user needs to set the F parameter related to weighing before entering the formal calibration step.The parameters involved are:

Serial number	F parameter	default	meaning	remarks
1	F01	10	Grading value	
2	F02	0	Decimal digits of weight	
3	F03	030090	Scale full scale value	
4	F04	1.1	Zero range	
5	F05	0.5	zero trace	
6	F09	1.0	Filter coefficient	
		1.0	2. Filter coefficient of scale	
7	F10	0.2	Determination of stable time	
8	F11	1.0	Judging the scope of stability	

Table 6.6 related weighing parameters

6.1 calibration, angular error correction, sensor number

（1） It is also necessary to calibrate each sensor, including one zero point, one zero point and one zero point for each sensor

（2） When multiple digital sensors are used for one scale, it is necessary to correct the angular difference and axle difference

（3） Correctly connect multiple sensors to the instrument, and set the number of sensors on the instrument. The instrument will address the sensor automatically.Automatic addressing is random, so users can address sensors according to certain rules.It's not necessary,However, it is strongly recommended to address the sensor according to certain rules before debugging. This has the following advantages: 1. Check whether the sensor is suspended by the way; 2. It is convenient for later maintenance; 3. Axle error correction must be addressed according to the rules, i.e. No. 1, No. 2, No. 3 and No. 4, and so on

The specific steps are as follows:

button	Lower row display	Upper row display	meaning
【Fxx】	[F01]	[d ***]	In the weighing display state, press and hold the [FXX] key, and the lower row will flash. If the lower row displays [F00]. Then enter the password above the administrator level, log in first, and then perform this step again
Press and hold	[F12]	[0-cALoo]	Press and hold continuously to locate F12
[input]	[F12]	[0-cALoo]	The upper row flickers, and the following operation items can be selected 1. [0-caloo] means zero point calibration, 2. [1-call D], indicating the calibration of loading point 3. [2-adjcn] denotes the corrected angular difference or axial deviation 4. [3-addr], indicating the adjustment of sensor number
When the zero point of calibration is selected:			
	[F12]	[0-cALoo]	Select load point calibration
[input]	[F12]	[ooo-00]	Zero point calibration, use the direction key to modify the two digits to select the sensor to calibrate the zero position. If it is 00, it means to calibrate the zero position of all sensors
[input]		Return to normal display	Operation completed
Selection of loading point criteria:			
【↑】	[F12]	[1-cALLd]	If load point calibration is selected
[input]	[F12]	[cAL-00]	Zero point calibration: select the sensor to be calibrated with two digits after modifying with the direction key. If it is 00, it means to calibrate the total weight of all sensors
[input]	[cAL-00]	[000000]	Enter the target weight with the arrow keys
[input]		Return to normal display	Operation completed
If the correction angle difference or axis difference is selected, then:			

【↑】	[F12]	[2-AdJcn]	Select correction angle difference or axis difference
[input]	[F12]	[AdJ-01]	When loading at a certain sensor point, the last two digits show the number of the sensor with the largest load. If 99 is input, it means the axle error correction
[input]	[AdJ-01]	[000000]	Enter the target weight with the arrow keys
[input]		Return to normal display	Operation completed
If you choose to adjust the sensor number:			
【↑】	[F12]	[3-Addr]	Select the adjustment sensor number
[input]	[Adr-3]	[00-00]	The two digits on the left display the number of the sensor with the largest load currently, and input the target number to be modified on the right
[input]		Return to normal display	Operation completed

Table 6.3 calibration and debugging steps

6.2 Calculate the calibration method and check the calibration coefficient.

The calibration of calculation method can be completed by parameter F30. The calibration coefficient of the parameter is obtained by theoretical calculation method, and the calculation formula is as follows:

Sensor scale / sensor scale factor

The specific steps are as follows:

button	Lower row display	Upper row display	meaning
【Fxx】	[F01]	[d ***]	In the weighing display state, press and hold the [FXX] key, and the lower row will flash. If the lower row displays [F00]. Then enter the password above the administrator level, log in first, and then perform this step again
Press and hold	[F30] flash	[r-cAL]	Press and hold the [↑] continuously to quickly locate F30
[input]	[R01] flash	[0.1666666]	Calibration coefficient of 1 ○ sensor
[→] key	[R02] flash	[0.1666666]	2. Calibration factor of sensor

When the lower row flashes, the [←] [→] key can switch to display the calibration coefficient of each sensor. When the upper row flashes, the direction key can be used to modify the coefficient. Press the [Enter] key to switch the flashing of the upper and lower rows

Table 6.4 Steps of Calculation Method Calibration

VII. Setting of other working parameters

7.1 Parameter setting and protocol of full-function communication port

The 2# communication port is a full-function communication port, the communication mode, address and baud rate can be set, and it supports the top loose protocol, the standard Modbus RTU protocol, multiple continuous transmission modes, etc.

The F parameters involved are F06 (communication mode), F07 (communication address) and F08 (communication baud rate). Please refer to the specific setting method. Section 5.5. Communication mode F06 determines the protocol currently used by this communication port. See the following table for details.

Protocol type	Communication mode F06	Communication data format			remarks
		data bit	Check digit/mode	Stop bit	
Top loose agreement	0	7-bit ASC code	1-bit/even check	1 bit	This protocol is an instruction response mode. When F6 = 3, the check word (CHK) is not checked for correctness or presence when receiving data. See Appendix 1 for details.
	1	7-bit ASC code	1-bit/odd check	1 bit	
	2	8-bit ASC code	No parity	1 bit	
	3	7-bit ASC code	1-bit/even check	1 bit	
Continuous transmission mode	4	7-bit ASC code	1-bit/even check	1 bit	Sent every 35mS See Appendix 2 for details of the agreement.
	5	7-bit ASC code	1-bit/odd check	1 bit	
	6	8-bit ASC code	No parity	1 bit	
Serial port printout	8	8-bit ASC code	No parity	1 bit	The input busy signal is high (common)
	9	8-bit ASC code	No parity	1 bit	The input busy signal is low
Modbus RTU	10	8	1-bit/even check	1 bit	See Appendix 3 for register function table
	11	8	1-bit/odd check	1 bit	
	12	8	No parity	Two	
	13	8	No parity	1 bit	

7.2 OC door outlet OUTB is used as the outlet of large screen.

If any parameter of 1 g large screen output content rdp1 and 2 ○ large screen output content rdp2 under f37 parameter of f parameter is not 0, then OC gate output port outb is switched to large screen output port, and the original output function is disabled. Rdp1 and rdp2 can be set as follows:

Serial number	parameter	show contents	Serial number	parameter	show contents
1	000	Main display shows 0 / auxiliary display does not display	6	092	Variable p92,2? Tare weight
2	001	Variable P01	7	099	Variable p99
3	……	……	8	100	1. Gross weight
4	090	Variable p90,2? Gross weight	9	101	1. Net weight
5	091	Variable p91,2 ○ net weight	10	102	1. Tare weight

Table 7.2 parameters and contents of output variables of large screen

The output port is a current loop, which can connect 1-2 large screens. When connecting two large screens, either the series method or the parallel connection method can be used. For details, see Section 4.4。When using the company's large screen, if two large screens are connected, each large screen can automatically identify its own corresponding display variable (see its manual for the setting of large screen serial number), so as to realize the function of 1 × large screen displaying 1 g variable and 2 ○ large screen displaying 2 ○ variables, such as one displaying gross weight and one displaying net weight.

7.3 Modify the login password

The password of user and administrator can be modified, but the password of manufacturer is dynamic and cannot be modified.As long as you use the correct password for the second login, you can enter the password modification interface.The specific steps are as follows:

button	Lower row display	Upper row display	meaning
【Fxx】	[F01]	[d ***]	In the weighing display state, press and hold the [FXX] key, and the lower row will flash. If the lower row displays [F00]. Then enter the password of the level you want to change, log in first, and then perform this step again

【↓】	[F00]	[PP-----]	Choose to log in again
[input]	[F00]	[PP-----]	After pressing the input key, the right most horizontal bar in the upper row flashes
direction key	[F00]	[PP----1]	Enter the corresponding password (take the factory default user password as an example).
[input]	[F00]	[n1-----]	In the new password input interface, the rightmost bar in the top row flashes.
direction key	[F00]	[n1*****]	Enter a new password for the first time through the arrow keys.
[input]	[F00]	[r1-----]	In the new password input interface, the rightmost bar in the top row flashes.
direction key	[F00]	[r1*****]	Through the arrow keys, enter the new password again to verify the consistency.
[input]	[F00]	[ok1]	OK1 is displayed, indicating that the user password has been successfully modified. After displaying for 1 second, it will automatically exit to the weighing display state. If it is inconsistent with the password entered for the first time, the previous step will still be displayed.

Table 7.3 Modification Steps of Login Password

Note: The second login must be the same level password, otherwise it will switch between different login levels, and you cannot enter the password modification interface.

Note: If you forget your login password, please contact us for relevant operation information.

7.4 Calibration and setting of analog output port

This instrument has two 4-20mA analog output ports, and the variables corresponding to each output port can be set, and the corresponding full scale can also be set.

If analog output is used for the first time, it may need to be calibrated first (it has been uniformly calibrated at the factory). The calibration method is as follows:

button	Lower row display	Upper row display	meaning

【Fxx】	[F01]	[d ***]	In the weighing display state, press and hold the [FXX] key, and the lower row will flash. If the lower row displays [F00]. Then enter the password above the administrator level, log in first, and then perform this step again
Press and hold	[F23]	[A-oUt1]	Press and hold [↑] continuously to quickly locate F23.
[input]	[F23]	[rEP 101]	According to the variable corresponding to the current analog quantity, P101 is the net weight of scale 1#.
directio n key	[F23]	[rEP 101]	The variables can be modified through the arrow keys. See Table 7.2 for details.
[input]	[F23]	[FUL 104]	20mA corresponding quantity, if set to 104, it corresponds to the full scale of the scale.
directio n key	[F23]	[FUL 104]	Through the direction key modification, the variables are shown in Table 7.2.
[input]	[F23]	[AdJ1 04]	Analog output calibration, press [Input] directly without calibration. At this time, the output port No.1 is 4ma. Press [↑] to increase the output current value and [↓] to decrease the current value. The output value can be detected by external meter and other measuring tools.
[input]	[F23]	[AdJ1 16]	Press the [←] →] key to input the output value, taking 16mA as an example. Press [↑↑↑↑↑↑↑↑↑↑↑↑↑↑↑↑↑↑↑↑ ↑↑↑↑↑↑↑↑↑ Through the adjustment of two points, the output accuracy of analog quantity is calibrated.
[input]	[F23]	[A-oUt1]	Adjustment completed.

Table 7.3 Specific steps of analog output port calibration and setting

Note: 2# analog output port is adjusted in F24, and the steps are exactly the same.

7.5 Calibration and setting of analog input port

This instrument has a 4-20mA analog input port, which can be connected with external analog input for inputting control parameters.

If the analog input port is used for the first time, it may need to be calibrated first (it has been uniformly calibrated at the factory). The calibration method is as follows:

button	Lower row display	Upper row display	meaning
【Fxx】	[F01]	[d ***]	In the weighing display state, press and hold the [FXX] key, and the lower row will flash. If the lower row displays [F00]. Then enter the password above the administrator level, log in first, and then perform this step again
Press and hold	[F25]	[A-In]	Press and hold [↑] continuously to quickly locate F25.
[input]	[F25]	[04--00.00]	On the left, the current external input accurate current number is displayed, and on the right, the current value measured by the instrument input port is displayed. Increase the output current value by pressing 【↑ 】 and decrease the current value by pressing 【↓ 】
[input]	[F25]	[16--00.00]	Press the [←] →] key to adjust the input current. Take 16mA as an example. Press [↑] to increase the output current value and [↓] to decrease the current value. Through the adjustment of two points, the accuracy of analog input port is calibrated.
[input]	[F25]	[A-In]	Adjustment completed.

Table 7.4 Specific steps of analog input port calibration and setting

7.6 Settings of panel display content

The panel display is double-row digital tube display, the specific content of which can be set freely, and the F parameters involved are F20 and F21. DSP1 in parameter F20 corresponds to the upper row main display, KP1 corresponds to the upper row auxiliary display, DSP2 in parameter F21 corresponds to the lower row main display, and KP2 corresponds to the upper row auxiliary display. All four parameters can be set to the following:

Serial number	parameter	show contents	Serial number	parameter	show contents
1	000	Main display shows 0 / auxiliary display does not display	5	100	Process executor status
2	001	Strain P01	6	101	Cumulative times
3	……	……	7	102	Cumulative weight

4	099	Strain P99	8	103	Current weight

Table 7.4 shows variable parameters and contents.

If nonexistent content is set, [---] will be displayed.

Note: Sub-display refers to the contents displayed on the display panel when the [Display] key is pressed and held in the weighing display state.

Note: Whether it is the primary display or the secondary display, the configuration in the workflow takes a higher priority. If the process is set, the settings of parameters F20 and F21 are invalid after the process is started (they are still valid when the process is stopped).

Note: If the password of User-1 or above is logged in, there is a fixed second display in the lower row, which indicates the working state of the current process executor, which is convenient for process debugging. The secondary display and the second secondary display are switched in turn every time the [Display] key is pressed.

7.7 Timed shutdown function

The timed shutdown function belongs to the project above the level of administrator (User-2), and the corresponding F32 parameter appears only after logging in with the corresponding password. The following steps assume that you have logged in correctly:

button	Lower row display	Upper row display	meaning
【Fxx】	[F01]	[d ***]	In the weighing display state, press and hold the [FXX] key, and the lower row will flash. If the lower row displays [F00]. Then enter the password above the administrator level, log in first, and then perform this step again
Press and hold	[F32]	[d-oF]	Press and hold [↑] continuously to quickly locate F32.
[input]	[F32]	[dAY 1366]	Enter the timing days setting, and the rightmost digit in the upper row flashes.
directio n key	[F32]	[dAY 100]	Set the number of scheduled days (take 100 days as an example here) 1-1365 is optional, and 1366 means infinite length (i.e. there is no scheduled shutdown function).
[input]	[F32]	[Y1 0]	express
[input]	[F32]	[Y2 0]	
[input]	[F32]	[Y3 0]	

[input]	[F32]	[Y4 0]	Said whether to enter the input and output adjustment settings, select 0 here.
[input]	[F32]	[d-oF]	Set up

Table 7.5 operation steps of timing shutdown function

Note 1: the following functions are not available once the timing shutdown is reached:

Note 2: to turn off the timed shutdown function, that is, to set the day in the above table to 1366

7.8 Input and output position adjustment

Under normal circumstances, the number of the input and output ports in the instrument corresponds to the identification on the panel of the host. In some special cases, such as the input and output ports corresponding to the working process are damaged, but the host has idle input and output ports, the mapping relationship between the internal number and the external display identification can be modified by using the I / O position adjustment function,The instrument can be used continuously without modifying the process.

This function belongs to the item above the level of administrator (user-2), and the function of timing shutdown is set in section 7.6. In the same f parameter F32, when setting Y4 parameter, modify it to 1 to enter the function. The following steps assume that the user has successfully logged in and entered the F32 modification project (if not, please refer to the steps in section 7.4)

Input and output position adjustment procedure table

button	Lower row display	Upper row display	meaning
[input]	[F32]	[Y4 0]	Indicates whether to enter the input / output adjustment setting
【↑】	[F32]	[Y4 1]	Select 1 here to enter the function
[input]	[F32]	[In1 1]	Remap input port 1, for example: if it is set to 2, it will be mapped to in2
[input]	[F32]	[In2 2]	Remap input 2
[input]	[F32]	[In3 3]	Remap input 3
[input]	[F32]	[In4 4]	Remap input 4
[input]	[F32]	[In5 5]	Re input 5 mapping
[input]	[F32]	[In6 6]	Remapping input port 6
[input]	[F32]	[In7 7]	Remapping input 7
[input]	[F32]	[In8 8]	8-port mapping

[input]	[F32]	[oUt 1 1]	Remap output port 1, for example: if it is set to 2, it will be mapped to out2
[input]	[F32]	[oUt2 2]	Remap output 2
[input]	[F32]	[oUt3 3]	Remap output 3
[input]	[F32]	[oUt4 4]	Remap output 4
[input]	[F32]	[oUt5 5]	Remap output 5
[input]	[F32]	[oUt6 6]	Remapping output 6
[input]	[F32]	[oUt7 7]	Remap output 7
[input]	[F32]	[oUt8 8]	The remap output port 8
[input]	[F32]	[oUt9 9]	The remap output port 8
[input]	[F32]	[oUtA A]	The remap output port 10
[input]	[F32]	[oUtb b]	The remapping output port 11
[input]	[F32]	[oUtc c]	The remap output port 12
[input]	[F32]	[d-oF]	Set up

Table 7.6 Operating Steps of Input/Output Position Adjustment Function

VIII. Instrument testing and other operations

8.1 Instrument test function

This instrument has rich testing functions, which is convenient for on-site debugging and use. All the test functions of are implemented in the F parameter. Please refer to Section 5.5 for how to access this parameter. The specific items tested are as follows:

Serial number	test item	show	operating procedure
F14	Nixie tube Led display	[tESt-dSP]	Press [Enter], and the meter will automatically test the LED and nixie tube display. Scroll the display visually, and judge the display failure.
F15	relay delivery outlet	[o-000000]	Press [Enter], enter the output port to be tested, and you can test a single one. You can also test more than one. Enter [o-00002] if the output No.2 is tested; For test No.123, enter [o-000123], then press [Enter], the corresponding output port will act, and the indicator light on the front panel will light up at the same time, then press after the test. [Cancel] to exit the test.
F16	High speed pulse input port	[tSt-PSUL]	Press [Enter] to display [A00000]. At this time, input a signal at the pulse input port, and the meter will display the measured pulse number. Press after the test. [Cancel] to exit the test.
F26	Internal RAM	[tSt- rAn]	Press [Enter], and [good ram] will be displayed if there is no fault. Otherwise, [bad ram] is displayed.
F28	2# communication port	[SSIo --]	The detection method is to short the two signal lines RXD and TXD of RS232 communication, and the display: [ssio 1-] indicates that RS232 communication is normal. Connect the capacitor of 0.1uF between two signal lines A and B of RS485 communication, and the display: [ssio -2] indicates that RS485 communication is normal.

Table 8.1 Table of Test Function Items

8.2 Instrument power-on self-test and fault display code

After the instrument is powered on, the relevant information of the instrument

will be displayed first. The upper row of the display panel displays the instrument model and software version number, and the lower row displays the version date. Then, the internal self-test of the instrument starts. If any error is found, the error code number will be displayed. Multiple errors will be displayed for a certain time in turn, and then the normal working cycle will be started. If the process number is set,The correspond workflow will be automatically started.

Inside this instrument, there is a button cell to save the working state before power failure, and these states will be recalled after power-up. For workflow, after power-on, the process controller will perform a power-on trigger function, and if the process has corresponding operations, it will be executed.

After the power supply is turned on, if all the following conditions can be met, the instrument will perform a weight zero setting, which is to set zero for startup:

(1) The workflow is not in the control state of feeding or discharging.

(2) The weight can collect stable data within 6 seconds after power-on.

(3) The weight value is within the range of starting and zeroing (see F parameter table F04).

8.2.1 Boot failure code

During the self-test of the instrument after power-on, the following error codes may be displayed:

Serial number	Code display	Fault meaning	processing method
1	[EPr 1]	Internal RAM failure	Repair in factory
2	[EPr 2]	Power failure detection fault	Check whether the input voltage is normal.
3	[EPr 3]	Loss of internal RAM data	Check whether the button cell on the motherboard is dead.
4	[EPr 4]	Loss of internal ROM data	Repair in factory
5	[EPr 5]	Internal program data error	Repair in factory
6	[EPr 20]	Internal clock error	Check whether the button cell on the motherboard is dead.

Table 8.2 Boot Fault Display Codes

8.2.2 Fault codes in normal operation

During the use of the instrument, the following fault codes may also be displayed:

Serial number	Code display	Fault meaning	processing method
1	[Err 03]	Weight overload	Check the load, sensor, or calibration coefficient on the scale.
2	[Er1 06]	1# sensor failure	Check 1# sensor, main line, terminal connection line and junction box.

3	[Er2 06]	2# sensor failure	Check 2# sensor, main line, terminal connection line and junction box.
4	[Err220]	Undervoltage power supply	Check the supply voltage

Table 8.3 Fault display codes in use

8.3 The instrument weight is set to zero and the total accumulated quantity is cleared.

8.3.1 Set the instrument to zero manually.

After the instrument has been used for a period of time, due to various reasons, the zero point may shift to a certain extent, so it is necessary to manually reset the zero point. In the absence of any level password, the weight range of reset operation needs to meet the requirements of parameter F04. The specific operation steps are as follows:

button	Lower row display	Upper row display	meaning
[Set to zero 1]	[***]	[***]	In the normal weighing state, wait for the weight to stabilize (the stabilizing light is always on). Press [Set to zero 1]
	[***]	[0]	(This is assuming that the gross weight/net weight of scale 1# is displayed in the upper row)

Table 8.4 Operating Steps of Manual Zero Setting

Note: If it is unstable or the current weight exceeds the zero setting range, zero setting is invalid.

Note: After the zeroing operation is successfully completed, the current tare value corresponding to the corresponding scale number will also be zeroed.

Note: After logging in the password of user (User-1) or above, the zeroing range is unlimited, and the zeroing operation at this time is equivalent to The zero point is calibrated.

Note: The above figure shows the manual zeroing operation of scale 1#. If you want to operate scale 2#, press [zeroing 2] according to the above steps.

8.3.2 Cumulative amount of clearance

In some workflows, cumulative quantity may be displayed. If you need to clear the current cumulative quantity, you can do the following:

button	Lower row display	Upper row display	meaning
[clear]	[ ]	[SUrE 0]	In the normal weighing state, press and hold [Zero 2] for more than 2 seconds.
【↑】	[ ]	[SUrE 1]	1, indicating that the operation of clearing cumulant is selected.
[input]	[***]	[*****]	The accumulated amount will automatically return to the weighing state.

Table 8.5 Operation Steps of Clearing Cumulative Amount

8.4 Start and Exit of Process

By default, the flow number parameter F19 of the instrument is 00, indicating that there is no working flow. Users need to set the corresponding workflow number to meet their own requirements before the instrument can enter the corresponding working cycle. Users can choose the fixed workflow built into the instrument, or burn it into the instrument through the serial port through computer software. (See related information of process for details)

Under normal circumstances, if the process number is set, after the instrument is powered on and started, the workflow will be started automatically without manual intervention. However, in some debugging situations, it may be necessary to start or stop the workflow manually. This function belongs to user (User-1) or above, so you need to log in first. Login later:

Press the [Start] key to start the workflow.

Press and hold the [Start] key for more than 2 seconds (equivalent to the [Stop] key) to stop the workflow.

8.5 Restore factory settings.

To restore the items set at the factory as user (User-1) password level or above, the following steps assume that you have successfully logged in:

button	Lower row display	Upper row display	meaning
【Fxx】	[F01]	[d ***]	In the weighing display state, press and hold the [Fxx] key for a long time, and the lower row will flash. If [F00] is displayed in the lower row. Then enter the password above the user level to log in first, and then do this step again.
Press and hold	[F31]	[Init 0]	Press and hold [↑] continuously to quickly locate F31.
【↑】	[F31]	[Init 1]	1, indicating that the initialization operation is selected.

[input]	[F31]	[InIt ok]	Indicates that initialization is complete.
[cancelled]	[***]	[*****]	Exit the settings menu

Table 8.6 Operation Steps to Restore Factory Settings

Note: Please use this function carefully. When factory settings need to be restored, please save important parameters and data, such as tare value and calibration coefficient.

IX. Appendix

Appendix 1 Top Loose Communication Protocol

The loose communication protocol is a master-slave protocol based on Ascii code bytes. Each lower computer (instrument) has a unique address, and the upper computer sends instructions to the lower computer at the specified address. After receiving the instructions, the lower computer returns the corresponding information if the verification is correct. After receiving the correct answer, the upper computer will process it. If it is not received for a certain period of time, it will be regarded as communication timeout.

1. Format of protocol data frame

Whether it is the upper computer or the lower computer, the data of each frame has the same structure as the start byte and the end byte, as shown in the following two sections.

1.1 upper computer sends data frame format

Frame	1	2	3	4	5	6
symbol	XON	ADDR	CMD	DATA	CHK	XOFF
meaning	leading flag	address	order	data	verify	end mark
Number of bytes	1	1	1	n	1	1
numerical value	0x02	A-Z	A-Z	*	*	0x03

Table 9.1 Data Frame Format of Upper Computer Sender

Part 1 (XON), fixed as 0x2, indicates the beginning of the data frame.

Part 2 (ADDR) is the address of the instrument. The value range is A-Z of Ascii code, which corresponds to 1-26 of the corresponding address parameters. After receiving the command, the lower computer will distinguish whether it is local data or not according to this address.

Part 4 (DATA), the number of bytes is uncertain, and it is 0 bytes under most commands.

The fifth part is the check code, which occupies one byte. The specific algorithm is:

XOR all the previous byte data of this data frame check code, and then OR with 0x40, that is

(CHK) = (XON) xor (ADDR) xor (CMD) xor (DATA1) xor (DATA2) xor … xor (DATAn) or (0x40)

Part 6 (XOFF), data frame end mark.

1.2 data frame format of answering end

Frame	1	2	3	4	5	6
symbol	XON	ADDR	CMD	DATA	CHK	XOFF
meaning	leading flag	address	order	data	verify	end mark
Number	1	1	1	n	1	1

of bytes						
numerical value	0x02	A-Z	a-z	*	*	0x03

Table 9.2 Data frame format of lower computer (instrument) answering end

The structure and meaning of the data frame answered by the answering end are the same as those of the sending end. The first difference is the third part (CMD), and the lower computer returns the lowercase letters of the corresponding commands. The difference is that the (DATA) part of the lower computer will definitely not be empty.

2, top loose communication protocol command detailed explanation

2.1 Command A to take the current weighing and status, including net weight, tare weight and various statuses.

Command (example address is a):

Command segment	XON	ADD	CMD	CHK	XOFF
Hex format	02	41	41	42	03
Ascii format	*	A	A	B	*

Slave answer:

content	XON	ADD	CMD	DATA							CHK	XOFF
				±	nnnnn	p	tttttt	e	f	u		
Hex format	02	41	61	See the table below.							49	03
Ascii format	*	A	a								I	*

DATA part of slave machine answer (Note: the specific data in the following table is an example)

DATA	±	nnnnn	p	tttttt	e	f	u
meaning	symbol	Net weight	decimal point	Tare weight value	mistake	condition	reserve
Hex format	2B	30 30 35 36 33 32	30	30 30 30 30 30 30	00	00	20
Ascii format	+	005632	0	000000			

Note: F represents the current state, and its bit meaning: D0- zero D1- stable D2- peeling.

2.2 Command B to read the accumulated data of the instrument.

Command (example address is a):

Command segment	XON	ADD	CMD	CHK	XOFF
Hex format	02	41	42	41	03
Ascii format		A	B	A	

Slave answer:

content	XON	ADD	CMD	DATA			CHK	XOFF
				cc	nnnnnn	ddddddddddd		
Hex format	02	41	62	See the table below.			49	03
Ascii format		A	b				I	

DATA answered by slave means:

DATA	cc	nnnnn	ddddddddddd
meaning	material code	Total times	Total weight

2.3 Command C to read the current display content of the instrument.

Command (example address is a):

Command segment	XON	ADD	CMD	CHK	XOFF
Hex format	02	41	43	40	03
Ascii format		A	C	@	

Slave answer:

content	XON	ADD	CMD	DATA		CHK	XOFF
				pp…p	abc		
Hex	02	41	62			49	03

format						
Ascii format		A	b		I	

DATA answered by slave means:

PP ... p-display characters of digital tube			
Abc-indicates the status			
The meaning of each binary bit of a		The meaning of each binary bit of b	
BIT number (bit)	working parameter	BIT number (bit)	working parameter
0	=1 indicates that relay No.1 works.	0	=1 indicates that the No.1 external input has a signal.
1	=1 indicates that relay No.2 works.	1	=1 indicates that external input No.2 has a signal.
2	=1 indicates that relay No.3 works.	2	=1 indicates that external input No.3 has a signal.
3	=1 indicates that relay No.4 works.	3	=1 indicates that the No.4 external input has a signal.
4	=1 indicates that relay No.5 works.	4	=1 indicates that there is a signal at external input No.5.
5	=1 indicates that relay No.6 works.	5	=1 indicates that the No.6 external input has a signal.
6	Hengwei 1	6	Hengwei 1
7	Check Digit	7	Check Digit
The meaning of each binary bit of c			
BIT number (bit)	working parameter		
0	=1 indicates that the No.7 external input has a signal.		
1	=1 indicates that the No.8 external input has a signal.		
2	=1 indicates that relay No.7 works.		
3	=1 indicates that relay No.8 works.		
4	=1 means peeling.		
5	=1 indicates stability.		

6	Hengwei 1			
7	Check Digit			

2.4 command d to read the control status of the specified instrument.

Command (example address is a):

Command segment	XON	ADD	CMD	CHK	XOFF
Hex format	02	41			03
Ascii format		A	D		

Slave answer:

content	XON	ADD	CMD	DATA	CHK	XOFF
				ijkl		
Hex format	02	41				03
Ascii format		A	d			

DATA answered by slave means:

IJKL—Status of external input port and output relay of instrument				
The meaning of each binary bit of I			The meaning of each binary bit of j	
BIT number (bit)	Work parameters		BIT number (bit)	Work parameters
0	=1 indicates that the No.1 external input has a signal.		0	=1 indicates that the No.7 external input has a signal.
1	=1 indicates that external input No.2 has a signal.		1	=1 indicates that the No.8 external input has a signal.
2	=1 indicates that external input No.3 has a signal.		2	=1 indicates that relay No.1 works.
3	=1 indicates that the No.4 external input has a signal.		3	=1 indicates that relay No.2 works.

4	=1 indicates that there is a signal at external input No.5.		4	=1 indicates that relay No.3 works.
5	=1 indicates that the No.6 external input has a signal.		5	=1 indicates that relay No.4 works.
6	Hengwei 1		6	Hengwei 1
7	Check Digit		7	Check Digit
The meaning of each binary bit of k			The meaning of each binary bit of l	
BIT number (bit)	Work parameters		BIT number (bit)	Work parameters
0	=1 indicates that relay No.5 works.		0	=1 indicates that relay No.11 works.
1	=1 indicates that relay No.6 works.		1	=1 indicates that relay No.12 works.
2	=1 indicates that relay No.7 works.		2	=1 indicates that relay No.13 works.
3	=1 indicates that relay No.8 works.		3	=1 indicates that relay No.14 works.
4	=1 indicates that relay No.9 works.		4	=1 indicates that relay No.15 works.
5	=1 indicates that relay No.10 works.		5	=1 indicates that relay No.16 works.
6	Hengwei 1		6	Hengwei 1
7	Check Digit		7	Check Digit

2.5 command k to perform a key function of the specified instrument.

Command (example address is a):

Command segment	XON	ADD	CMD	DATA	CHK	XOFF
				xx		
Hex format	02	41				03
Ascii format		A	K			

Slave answer:

content	XON	ADD	CMD	DATA		CHK	XOFF
Hex format	02	41					03
Ascii format		A	k	o	k		

2.6 Command Q to clear the accumulated data and consumption data of the specified instrument.

Command (example address is a):

Command segment	XON	ADD	CMD	CHK	XOFF
Hex format	02	41			03
Ascii format		A	Q		

Slave answer:

content	XON	ADD	CMD	DATA		CHK	XOFF
Hex format	02	41					03
Ascii format		A	q	o	k		

2.7 command t to read the parameters of the specified instrument.

Command (example address is a):

Command segment	XON	ADD	CMD	DATA	CHK	XOFF
				Txxx		
Hex format	02	41	56			03
Ascii format		A	U			

Slave answer:

content	XON	ADD	CMD	DATA		CHK	XOFF
				xxx	dddddddd		
Hex format	02	41					03
Ascii format		A	t				

2.8 Command U to set the parameters of the specified instrument.

Command (example address is a):

Command segment	XON	ADD	CMD	DATA	CHK	XOFF
				xxxddd		
Hex format	02	41	56			03
Ascii format		A	U			

Slave answer:

content	XON	ADD	CMD	DATA		CHK	XOFF
Hex format	02	41	62				03
Ascii format		A	u	o	k		

2.9 Command V sets the date and time of the specified instrument.

Command (example address is a):

Command segment	XON	ADD	CMD	DATA	CHK	XOFF
				yymmddhhnnss		
Hex format	02	41	56		52	03
Ascii format		A	V	171201205730		

Slave answer:

content	XON	ADD	CMD	DATA		CHK	XOFF
Hex format	02	41	62				03
Ascii format		A	v	o	k		

2.10 command w to set the specified instrument process execution pointer.

Command (example address is a):

Command segment	XON	ADD	CMD	DATA	CHK	XOFF
				ddd		
Hex format	02	41	57			03
Ascii format		A	W			

Slave answer:

content	XON	ADD	CMD	DATA		CHK	XOFF
Hex format	02	41	61				03
Ascii format		A	w	o	k		

Appendix 2 Command of Continuous Sending Mode

When the communication parameter F06 is set to 4,5,6,7, it is the continuous transmission mode. At this time, F07 no longer represents the instrument address, but represents the information content and format of continuous transmission. The time interval between two consecutive strings of data is 35 ms.

The sending format is as follows:

parameter F07	Format name	Content format	remarks
1	Top loose format 1	(STX)Aa±nnnnnnptttttteff(CHK)(ETX)	The return of a command
2	Yaohua old D2+ format	=51.0700=51.0700……	8 bytes per frame
3	/		
4	TOLEDO standard format		Without checksum
5	TOLEDO standard format		With checksum
6	705 format	ST,GS,+0012.34,kg(CRLF) US,GS,-002000,kg(CRLF)	
7	Top loose format 2	(STX)AA±nnnnnnptttttteff(CHK)(ETX)	
8	/		
9	/		
10	/		
11	Taiwan Province C-8500TS UMC600 format	(STX)- 12.34KGM(CRLF)	
12	XK3190-A9 mode	(STX)-002000PCC(ETX)	Yaohua
13	/		
14	Hbwe2110 format	(STX)- 12.34G(ETX) (STX)12.34M(ETX)	
15	Yaohua new D2+ format	=51.07000=51.07000……	9 bytes per frame
16	A8MD dynamic table format	[7F7F7F7F7F02]npss111222…..xxxC	
17	/		
18	RI5000 format	(STX)- 12.34G(CRLF) (STX) 12.34M(CRLF)	
19	HB8212 format	(STX)- 12.34 kg GRM(CRLF) (STX) 12.34 kg GR (CRLF)	Formosa plastics
20	EX2001 format	ST,GS,+0012.34kg(CRLF)	Similar to 1705

			format, there is no comma of 15th word.
21	Simplified Toledo format		With checksum
22	Simplified Toledo format		Without checksum
23	Yancheng Asano format		The same as TOLEDO simplified format checksum is changed to [0A]

Appendix 3: Continuous Transmission Format

Note: Please contact us if you need the details of continuous sending format.

Appendix 3 Modbus RTU communication function code table

Functional address	meaning		Register attribute
4x0000	Parameter: P01		4 bytes, signed, read/write
4x0002	Parameter: P02		4 bytes, signed, read/write
……			
4x0176	Parameter: P89		4 bytes, signed, read/write
4x0178	Parameter: p90 (gross weight of scale No.2)		4 bytes, signed, read-only
4x0180	Parameter: p91 (net weight of scale No.2)		4 bytes, signed, read-only
4x0182	Parameter: p92 (tare weight of scale No.2)		4 bytes, signed, read/write
4x0184	Parameter: P93		4 bytes, signed, read/write
4x0186	Parameter: P94 (pulse port count value)		4 bytes, signed, read/write
4x0188	Parameter: p95 (No.1 4-20mA output value)		4 bytes, signed, read-only
4x0190	Parameter: p96 (No.2 4-20mA output value)		4 bytes, signed, read-only
4x0192	Parameter: P97(4-20mA input value)		4 bytes, signed, read-only
4x0194	Parameter: P98		4 bytes, signed, read/write
4x0196	Parameter: P99		4 bytes, signed, read/write
4x0198	Bit 1	Output relay OUT1 status	2 bytes, unsigned, read-only
	Bit 2	Output relay OUT2 status	
	…	…	
	Bit 16	Output relay OUT16 status	
4x0199	Bit 1	Enter IN1 status	2 bytes, unsigned, read-only
	Bit 2	Enter IN2 status	
	…	…	
	Bit 12	Enter IN12 status	
	Bit 13	Output relay OUT17 status	
	Bit 14	Output relay OUT18 status	

	Bit 15	Output relay OUT19 status	
	Bit 16	Output relay OUT20 status	
4x0200	Output value of analog quantity (4-20mA)		2 bytes, unsigned, read-only
4x0201	Last stored item		2 bytes, unsigned, read-only
4x0202	Net weight of scale 1		4 bytes, signed, read-only
4x0204			4 bytes, signed, read-only
4x0206	Gross weight of scale 1		4 bytes, signed, read-only
4x0208			4 bytes, signed, read-only
4x0210	Current AD value of scale No.1		4 bytes, unsigned, read-only
4x0212	Panel number (see Note 3 for details)		2 bytes, unsigned, read/write
4x0213	Accumulated times of storage		2 bytes, unsigned, read/write
4x0214	Grading value		2 bytes, unsigned, read/write
4x0215	Low byte: weight decimal places, high byte: flow decimal places.		2 bytes, unsigned, read/write

Modbus RTU function code table (continued 1)

Functional address	meaning	Register attribute
4x0216	Zero range	2 bytes, unsigned, read/write
4x0217	Zero tracking range	2 bytes, unsigned, read/write
4x0218	Recipe number (formerly process number)	2 bytes, unsigned, read/write
4x0219	Judging the scope of stability	2 bytes, unsigned, read/write
4x0220	Calibration coefficient of scale No.1	4 bytes, unsigned, read/write
4x0222	Accumulated weight of stored	4 bytes, unsigned, read/write
4x0224	Zero point calibration AD value of No.1 scale	4 bytes, unsigned, read/write

4x0226	Maximum range	4 bytes, unsigned, read/write
4x0228	Remote control trigger pointer (can't write continuously, can only write once)	2 bytes, unsigned, write only
4x0229	Working state of 1# process executor	2 bytes, unsigned, read-only
4x0230	Working state of 2# process executor	2 bytes, unsigned, read-only
4x0231	Working state of 3# process executor	2 bytes, unsigned, read-only
4x0232	Working state of 4# process executor	2 bytes, unsigned, read-only
4x0233	Working state of 5# process executor	2 bytes, unsigned, read-only
4x0234	Working state of 6# process executor	2 bytes, unsigned, read-only
4x0235	Working state of 7# process executor	2 bytes, unsigned, read-only
4x0236	Working state of 8# process executor	2 bytes, unsigned, read-only
4x0237	Working state of 9# process executor	2 bytes, unsigned, read-only
4x0238	Working state of 10# process executor	2 bytes, unsigned, read-only
4x0239	Working state of 11# process executor	2 bytes, unsigned, read-only
4x0240	Working state of 12# process executor	2 bytes, unsigned, read-only
4x0241	Display panel digital tubes DSSP1,DSSP2	2 bytes, unsigned, read-only
4x0242	Display panel digital tubes DSSP3,DSSP4	2 bytes, unsigned, read-only
4x0243	Display panel digital tubes DSSP5,DSSP6	2 bytes, unsigned, read-only
4x0244	Display panel digital tube DSSP7,DSSP8	2 bytes, unsigned, read-only
4x0245	Display panel digital tube DSSP9,DSSP10	2 bytes, unsigned, read-only
4x0246	Display panel digital tube DSSP11,DSSP12	2 bytes, unsigned, read-only
4x0247	Display panel digital tube DSSP13,DSSP14	2 bytes, unsigned, read-only

4x0248	Output status (D0-D15):IN1-IN8,OUT1-OUT8	2 bytes, unsigned, read-only
4x0249	(D0-D15): Whether the formula can be set, IO test, zero position 2 Zero position, stable 2, stable 1, peeled 2, peeled 1 OUT9-OUT16	2 bytes, unsigned, read-only
4x0250	Current AD value of scale No.2	4 bytes, signed, read-only
4x0252	Zero point calibration AD value of No.2 scale	4 bytes, unsigned, read/write
4x0254	Calibration coefficient of No.2 scale	4 bytes, unsigned, read/write
4x0262	Calibration code 1	2 bytes, unsigned, write only
4x0263	Calibration code 2	2 bytes, unsigned, write only
4x0264	Calibration code 3	2 bytes, unsigned, write only
4x0265	Number of sensors	2 bytes, unsigned, read/write
4x0512	Calibration coefficient of No.1 sensor	4 bytes, unsigned, read/write
4x0514	Calibration coefficient of No.2 sensor	4 bytes, unsigned, read/write
4x0516	Calibration coefficient of No.3 sensor	4 bytes, unsigned, read/write
.....	.....	.....
4x0542	Calibration coefficient of No.16 sensor	4 bytes, unsigned, read/write
4x0544	Calibration coefficient of No.7 sensor (added on 21/05/30)	4 bytes, unsigned, read/write
.....	.....	.....
4x0636	Calibration coefficient of No.63 sensor	4 bytes, unsigned, read/write
4x0768	Internal code of No.1 sensor	4 bytes, signed, read-only

4x0770	Internal code of No.2 sensor	4 bytes, signed, read-only
.....	.....	.....
4x0798	Internal code of No.16 sensor	4 bytes, signed, read-only
4x0800	Internal code of No.7 sensor (added on 21/05/30)	4 bytes, signed, read-only
.....	.....	.....
4x0892	Internal code of No.63 sensor	4 bytes, signed, read-only
4x1024	Empty scale code of No.1 sensor	4 bytes, signed, read/write
4x1026	Empty scale code of No.2 sensor	4 bytes, signed, read/write
.....	.....	.....
4x1054	Empty scale code of No.16 sensor	4 bytes, signed, read/write
4x1056	Empty scale code of No.7 sensor (added on 21/05/30)	4 bytes, signed, read/write
.....	.....	.....
4x1148	Empty scale code of No.63 sensor	4 bytes, signed, read/write
4x1152	Weight of No.1 sensor (added on 21/05/30)	4 bytes, signed, read/write
.....	.....	.....
4x1276	The weight of No.63 sensor	4 bytes, signed, read/write

Appendix 1:Modbus RTU function codes

Note: The address of the register is orange, indicating that it was adjusted in 2016. Please check it again before using it.

Note: The maximum number of bytes read in a block is 120.

Note: The register (4x0212) is the panel key number, and writing a number into this register indicates that a key is pressed, which can be a physical key or an internal function key. See the following table for details:

Serial number	Schematic value	Actual written value	Corresponding function

1	128+1	129	Press the [↑] key of the short instrument.
2	128+2	130	Press the 【↓ 】 key of the short instrument.
3	128+3	131	Press the [←] key of the short instrument.
4	128+4	132	Press the [→] key of the short instrument.
5	128+5	133	Press the [Enter] key of the short instrument.
6	128+6	134	Press the [Cancel] key of the short instrument.
7	128+7	135	print
8	128+8	136	Print report
9	128+9	137	Print custom documents
10	128+10	138	1# scale calibration
11	128+11	139	Press the [↑] key of the long meter, which is equivalent to the [Stop] key.
12	128+12	140	This function is not available.
13	128+13	141	Press the [←] key of the instrument for a long time, which is equivalent to the [Clear] key.
14	128+14	142	Press the [→] key of the instrument, which is equivalent to the [Pxx] key.
15	128+15	143	Press the [Enter] key of the instrument, which is equivalent to the [Fxx] key.
16	128+16	144	This function is not available.
17	128+20	145	2# Scale Calibration
18	256+0	146	Exit IO test
19	256+1	147	Enter IO test.
20	256+1	147	Pass OUT1
21	256+2	148	Pass OUT2
……	……		
39	256+20	276	OUT20
40	288+1	289	Off 1
41	288+2	290	Off 2
……	……		
59	288+20	306	OUT20

Appendix 2: Values and Functions of Register (4x0212)

Revision history

version	date	Revision content	reviser
1.0.0	2017-11-24	1. Several illustrations were modified to adapt to PDF format. 2. All pictures and tables have been added with a number for easy indexing. 3. Unified the format of each interface description. 4. Some wording has been modified to make it easier for users to understand.	Bao Feiping
1.0.1	2017-11-25	1. Complete all the illustrations (there are still a few photos that haven't been put in) 2. Size of display panel and touch screen to be verified.	Bao Feiping
1.0.2	2017-11-27	1. The physical drawing of host and display panel has been added. 2. The layout of instrument interface is independent. 3. The title of the subsection after the big section of the text adopts Arabic numerals, such as 2.1,2.1.1.	Bao Feiping
1.0.3	2017-12-01	1. Added content. 1. Some pictures have been added.	Bao Feiping
1.1.0	2017-12-01	1. Basic stereotypes, all large pieces of content have been modified. 2. The top loose agreement still needs to be improved. 3. Some contents, such as display code, need to be improved. 4. Continuous sending mode removes the specific protocol content.	Bao Feiping
1.1.1	2017-12-05	1. Modified the opening size diagram of touch screen. 2.4 Add a description of the wire connection method (orange for emphasis)	Bao Feiping
1.1.2	2018-02-08	Some errors have been corrected.	Bao Feiping

What needs to be written in the future:

Connection of serial port printer