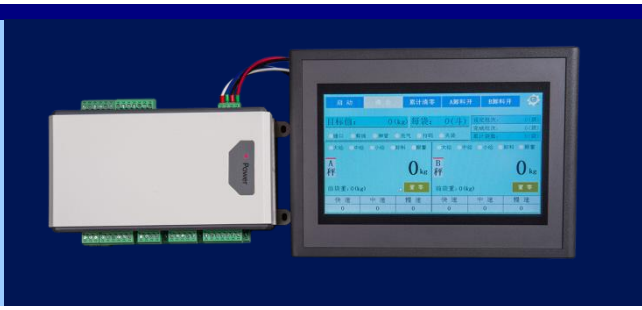
Multifunctional programmable weighing

DS822-A8STF(4421)

operation

DINGSONG



(Chinese version v1.0)

Hangzhou dingsong automatic control equipment Co., Ltd

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catalog

1brief introduction

Ds822-a8stf (4421) is a single scale split type programmable weighing controller, which can be connected to a weighing sensor. The host adopts the standard rail type installation, which can be directly connected to the touch screen as the man-machine interface, or to the display panel produced by our company.The controller has the characteristics of multi-function, high precision, high reliability and user programmable.

Figure 1.1 physical diagram of main engine and man-machine interface accessories

Hardware resources and functions

(1) There are 6 input and output switch points of common relay;

NPP type switching transistor or PNN;DC voltage signal, voltage range 6-24 V

(2) A high-speed pulse input port can be connected with high-speed pulse input, and can also be used as a common switch input point

(3) 4 relay outputs, contact capacity: AC220V, 5A or dc30v, 5A

(4) 2-way OC gate output, can control stepper motor: outa stepper motor pulse, outb stepper motor direction

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

(6) A high-precision conversion ad, can be connected to a load cell

(7) Two way communication interface

One is RS485 interface, 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

The other channel can be connected with RS485 / RS232 signal.It can be used to communicate with computer, PLC, etc

(8) 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, and the transmission distance can reach more than 1000 meters

(9) 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) A / D input signal range: -20mV ~ + 20mV (sensor sensitivity up to 4MV / V)

(2) A / D internal resolution: 1 / 1 million

(3) A/D conversion speed: 100 times per second

(4) A/D nonlinearity: <0.003%FS

(5) Gain drift: 2PPM/℃(TYP)

(6) Sensor power supply for bridge: DC5V (current > 200mA, up to 12 350Ω sensors can be connected)

(7) Power supply: Wide voltage AC100-240V,50-60Hz

(8) Operating temperature: -10℃～40℃

(9) Relative humidity: <90%

(10) Overall dimensions of the host: 176 × 85 × 71

(11) Overall dimensions of display panel: 160 × 85 × 30

2Structural dimensions of main engine and accessories

2.1 installation dimension drawing of main engine

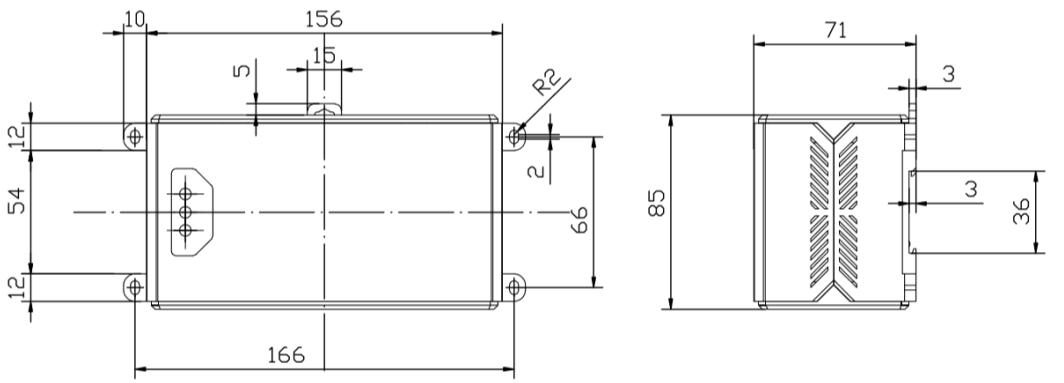


Figure 2.1 Installation Dimensions of Host

2.2 installation dimension drawing of display panel

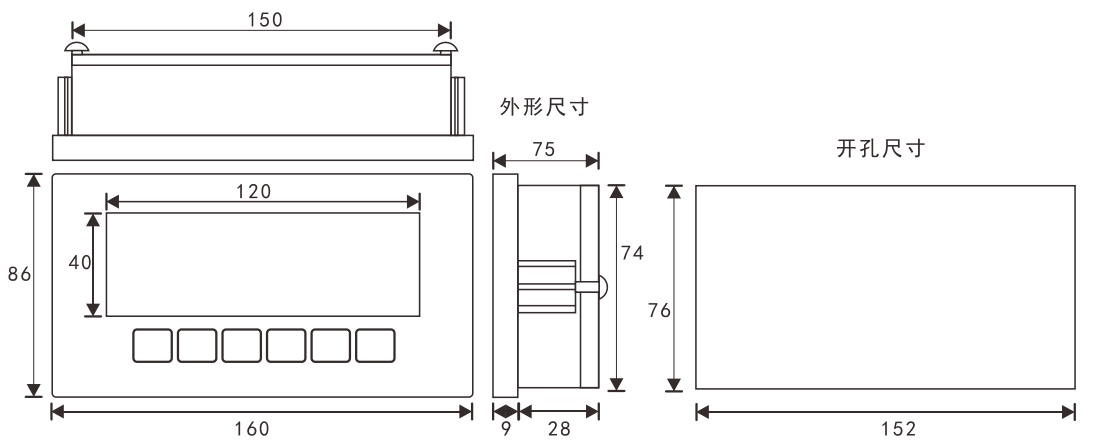


Fig. 2.2 Installation dimension diagram of display panel

2.3 installation dimension drawing of touch screen (7 inches)

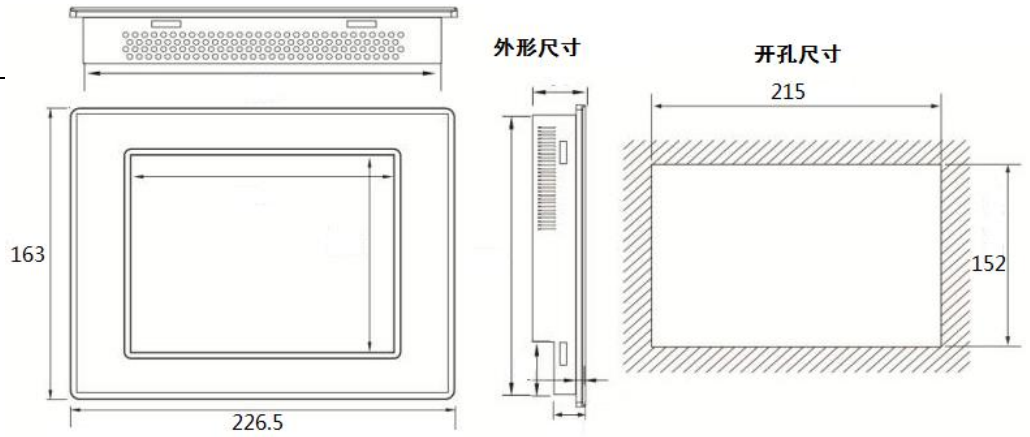


Figure 2.3 Installation Dimensions of Touch Screen

3Interface 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 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

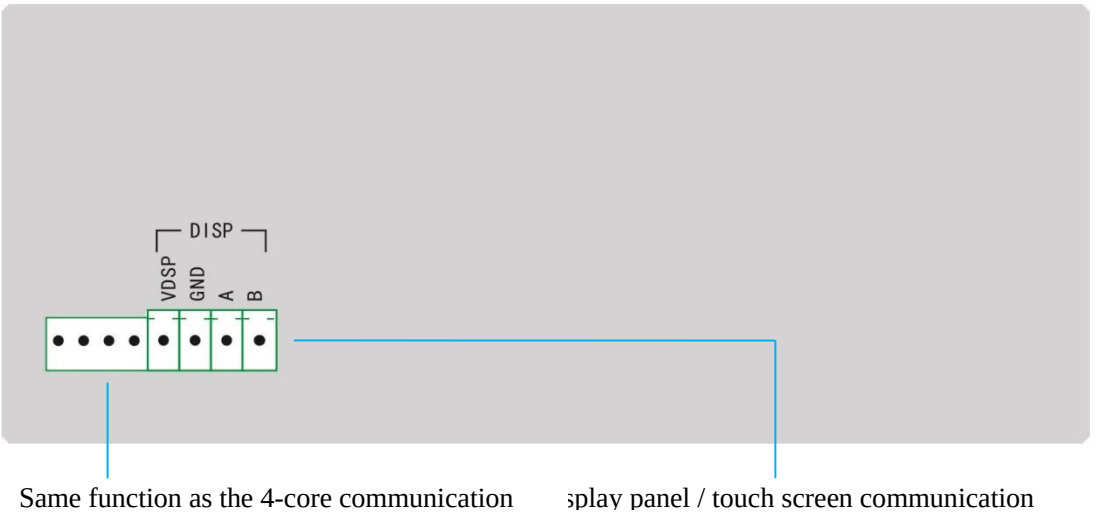
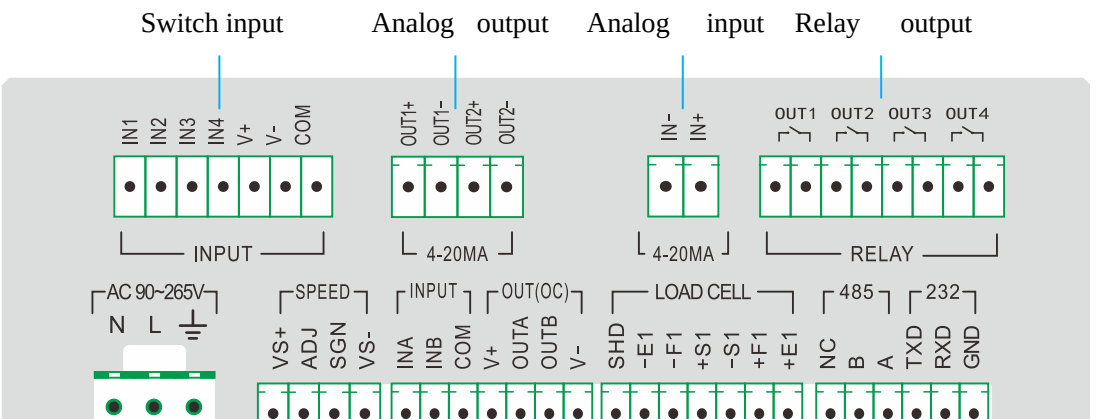


Figure 3.1 Functional Schematic Diagram of Panel A of Host

3.1.2 B side of instrument host panel



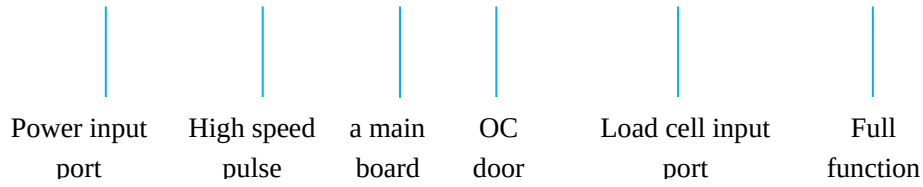


Figure 3.2 Functional Schematic Diagram of B Side of Host Panel

Note: Outlet OUTA(OUT5) and OUTB(OUT6) of 1:OC gate are multiplex ports, which can be connected with large screen and stepping motor.

Note: Mainboard input port INA corresponds to IN5, INB corresponds to IN6, and high-speed pulse port is common input port corresponding to IN7.

3.2 function layout of display panel

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)

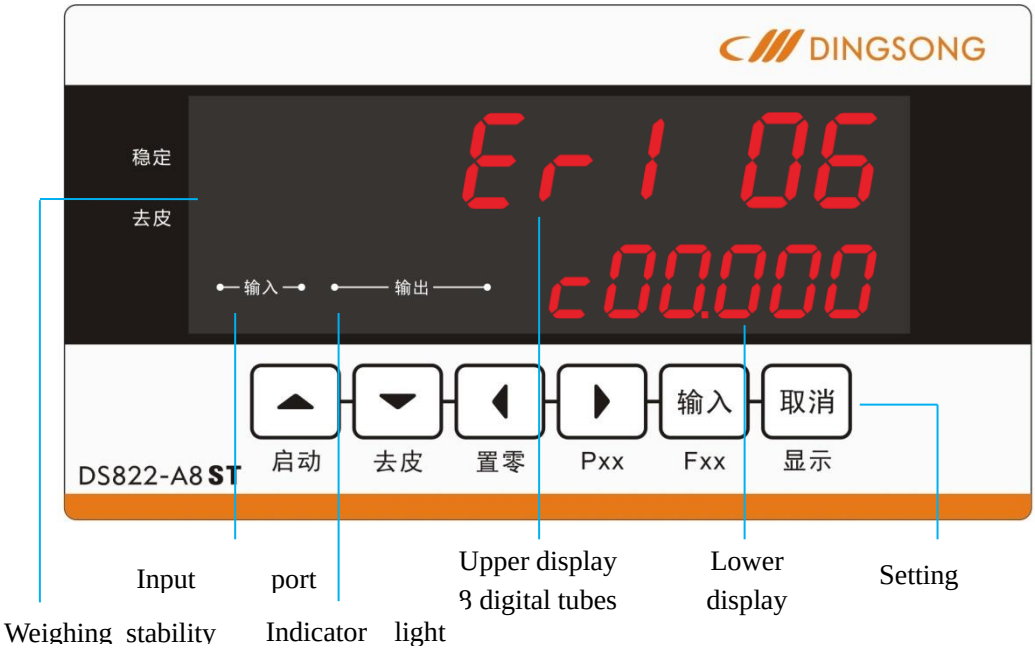
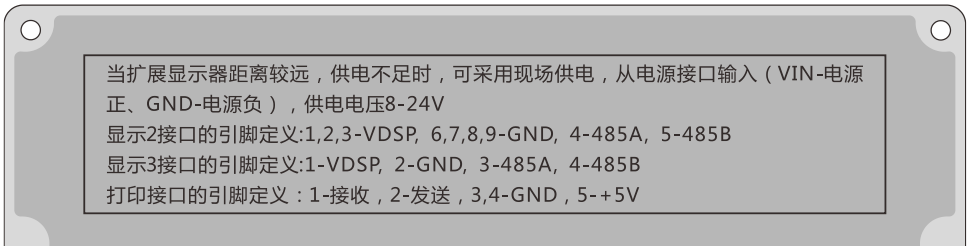


Figure 3.3 Functional diagram of display panel (front)

3.2.2 Display panel (back)



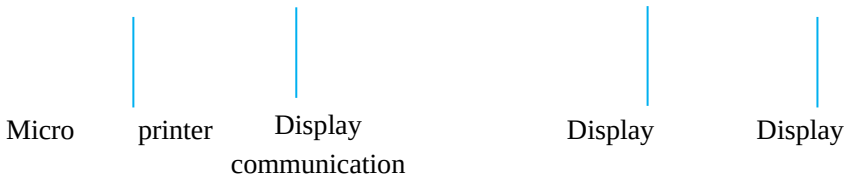


Figure 3.4 Functional diagram of display panel (back)

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.

4Instrument port connection method

4.1 General switch input port

input	Optocoupler isolation switching value	This instrument has six common switch inputs (IN1-IN6), with INA corresponding to IN5 and INB corresponding to IN6. The common terminal COM is not connected to any electrical node inside the instrument, and at the same time, the positive power supply (+V) and negative power supply (-V) are led out inside. The common terminal can be connected to +V or -V or not according to different needs. Each input port can be connected with push button, trigger switch, relay contact point, proximity switch, etc., and DC voltage signal (6-24V) can also be input. See the following figure for common connection.

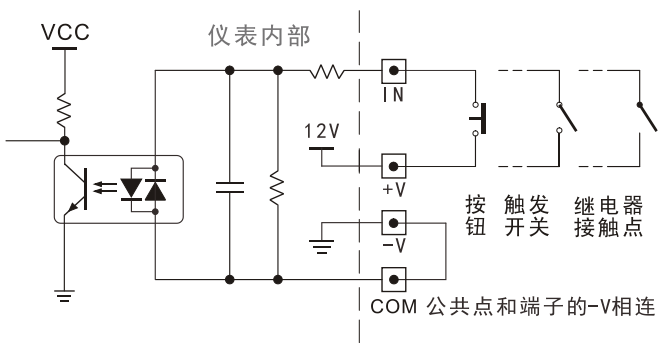
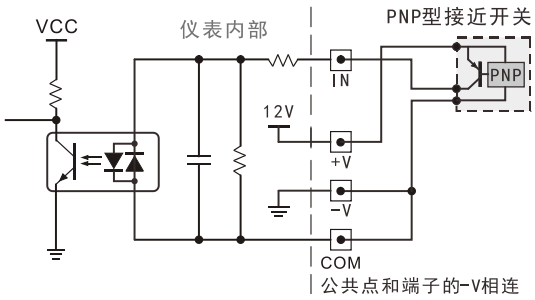


Figure 4.1 Schematic diagram of switch input connection

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.



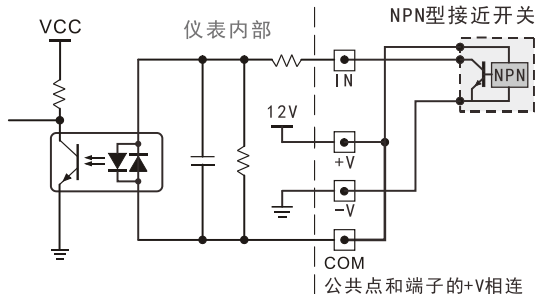


Figure 4.2 Schematic diagram of PNP proximity switch connection Figure 4.3 Schematic diagram of NPN proximity switch connection

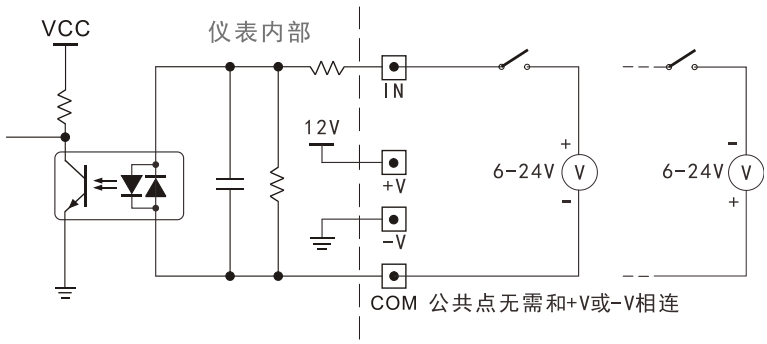


Figure 4.4 Schematic diagram of DC voltage signal input connection

4.2 relay output port

output	relay	A total of 6 outputs (1-6), 2 mainboards and 2 expansion boards. Contact capacity: AC220V/DC30V,5A. It can be directly connected to low-power resistive loads and low-power AC/DC inductive loads (such as AC contactor and DC contactor). If the load power is relatively large, please relay in series to prevent damage to this instrument.

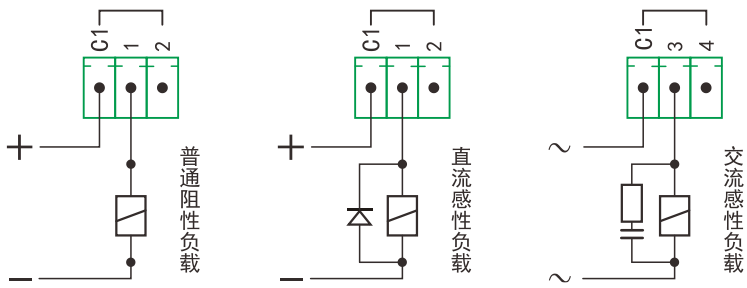


Figure 4.5 Schematic diagram of relay output connection

4.3 high speed pulse input port

input	High speed pulse	This instrument has a high-speed pulse input port (SPEED), which is electrically isolated by a high-speed optocoupler. This port can be connected to a speed sensor or used as a common switch input port. See section 7.2 for details.

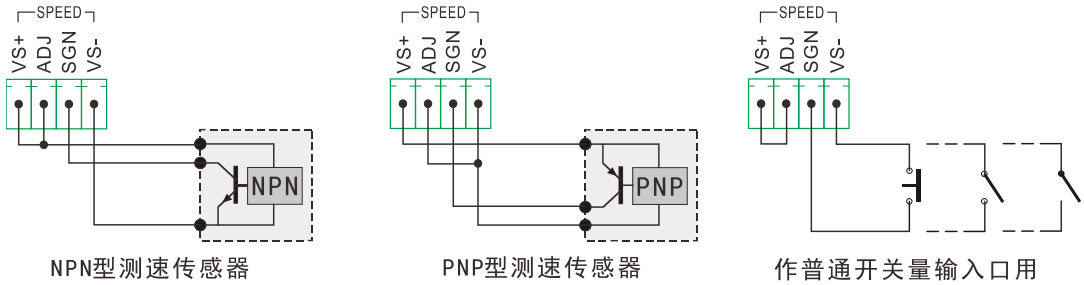


Figure 4.6 Schematic diagram of connection of high-speed pulse input port

4.4 transistor OC gate connected to large screen display

output	Communication current loop	This instrument can be connected to one or two large-screen displays. Note that this interface is multiplexed with the OC gate output port, and only one function can be selected. If you want to use this function, you must first set the parameter F37. See Section 7.3 for details.

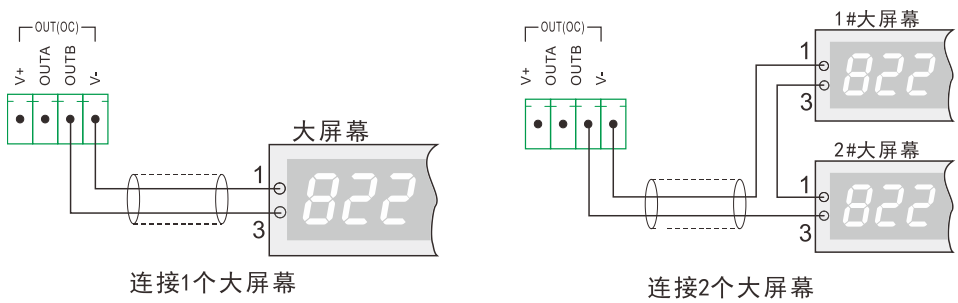


Figure 4.7 Schematic diagram of connection of large screen display

Note: Two large screens can also be connected in parallel, for example, the two input lines of two large screens can be connected in parallel in the left figure.

5. Step motor controlled by OC transistor

output	OC door	This instrument can directly control the stepping motor. It should be noted that this interface is multiplexed with OC gate outputs (OUTA, OUTB), and only one function can be selected at the same time. The factory default is the large screen output port. To use this function, you must first set rdP1 of parameter F37 to 111.

		OUTA: control pulse of stepping motor, and OUTB: direction control of stepping motor.

4.6 transistor OC gate as common output port

output	OC door	There are two channels of OC gate NPN OUT5, OUTB (OUTA corresponds to out5 and outb corresponds to OUT6), and the contact capacity is 24v and 60ma, which can be connected to external relays, PLC input ports, etc. See the following figure for the wiring method.

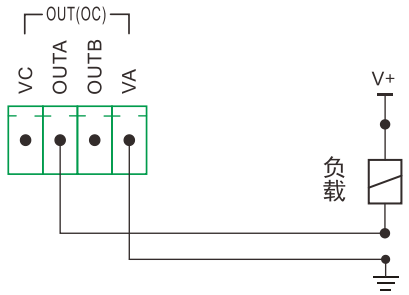


Fig. 4.8 schematic diagram of output connection of npn OC gate

4.7 analog output port

output	analog quantity 4-20mA	This instrument has two 4-20mA output ports, and the output content can be set.

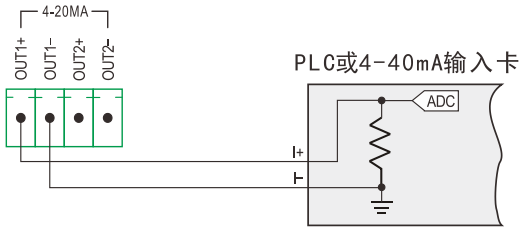


Figure 4.9 Schematic diagram of 4.9 4-20mA analog output connection

4.8 analog input port

input	analog quantity 4-20mA	This instrument has a 4-20mA input port, which can be connected with external analog input.

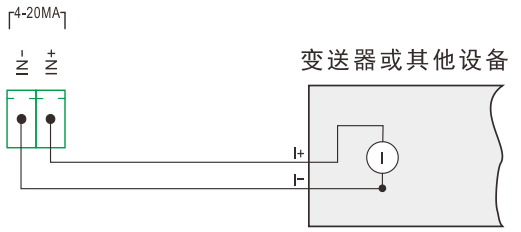


Figure 4.10 Schematic diagram of 4.10 4-20mA analog input connection

4.9 Load cell interface

input	weighing cell	This instrument has a high-precision AD, which can be connected with a load cell. The output arch bridge voltage of the instrument is DC5V, the excitation current is > 200mA, and it can be connected to at most 12 350Ω weighing sensors, with the signal input range of -20mV~+20mV, and the sensitivity of the connected sensors can reach up to 4 mV/V. 6-wire connection or 4-wire connection is optional. See the following table for the meaning of sensor interface.

4.9.1 Label and function of load cell interface

serial number	Sensor label	Corresponding function
1	+E1	Positive excitation voltage (positive supply bridge)
2	+F1	Feedback voltage positive (4-wire connection method and arch bridge positive short circuit)
3	-S1	Output signal negative
4	+S1	Output signal positive
5	-F1	Negative feedback voltage (4-wire connection method and negative short circuit of arch bridge)
6	-E1	Negative excitation voltage (negative supply bridge)
7	SHD	Shielding end

Table 4.1 Label and function of load cell interface

4.9.2 6-wire connection method of load cell

In order to increase the stability of the weighing signal at a long distance, the instrument and the sensor can be connected with a 6-wire system (long-line compensation mode), and the sensor should adopt a 6-core shielded wire, and it should be wired separately from the lines with strong interference (power equipment wiring, etc.) and AC lines. (see figure 4.12 below)

4.9.3 Four-wire connection method of load cell

If the distance is close, 4-wire connection method can be adopted. At this time, "E+" and "F+", "E-" and "F-" must be shorted on the interface terminals of the host sensor respectively. If it is not short-circuited, the instrument will not work normally, even sometimes it seems to work normally on the surface, but it will actually produce a big error, so it must be connected strictly according to Figure 4.13.

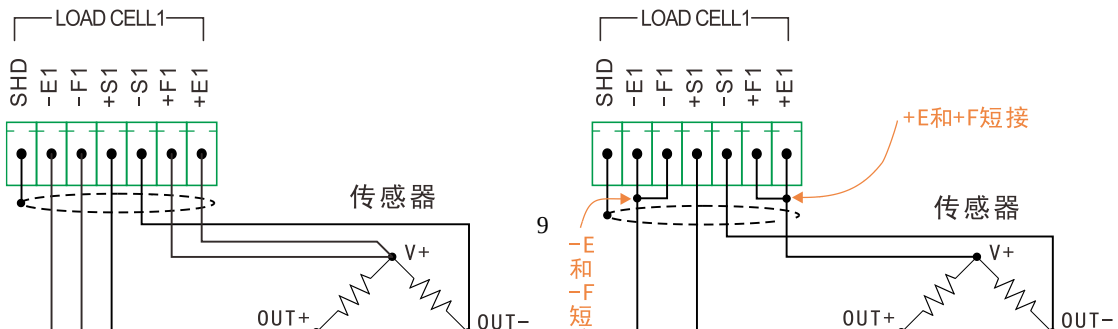


Figure 4.12 6-wire connection method of load cell Figure 4.13 4-wire connection method of load cell

4.10 communication interface

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

Figure 4.14 Schematic diagram of two communication interfaces of the instrument

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

B 2# communication port 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 a variety of continuous transmission modes can be selected. It can communicate with computers, PLC and other devices. See section 7.1 for details.

Note: When the 2# communication port is set to Modbus RTU protocol, it has the same function as the 1# communication port.

Note: The first interface NC on the left of 2 # communication port is not connected to any electrical node, and can only be used in special occasions.

4.10.1 Connection Method of 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.

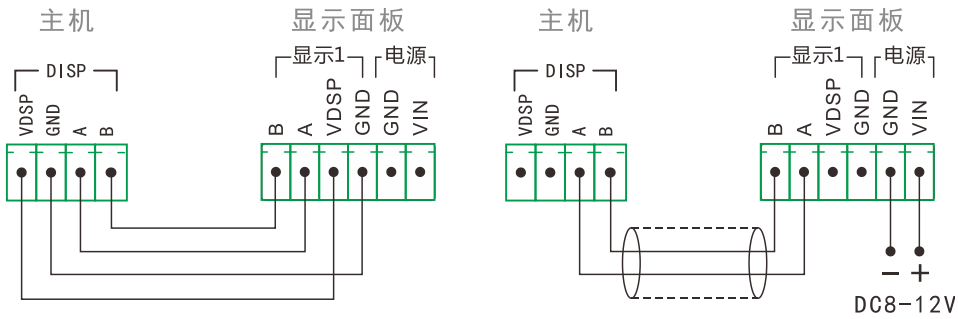


Fig. 4.15 Connection Method between Host and Display Panel

4.10.2 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.

5Parameter setting

5.1 function and operation of setting key on display panel

such 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	 启动	【↑】	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	 去皮	【↓】	Set the current menu item to flip down. Set the target number minus 1.	
		[Peeling]	Manual peeling	
3	 置零	【←】	Set the currently selected number to move left.	
		[set to zero]	Set zero or calibrate zero. Long press indicates [Clear] to clear the accumulated amount.	See section 8.3 /6.1 for details. See. 8.3festival
4	 Pxx	【→】	Set the currently selected number to move to the right.	

		【Pxx】	Long press to enter the p parameter setting.	See. Section 5.5
5	输入 Fxx	[input]	Confirm the current parameter setting	
		【Fxx】	Long press to enter f parameter setting.	See. Section 5.4
6	取消 显示	[Cancel]	Exit the current parameter setting.	
		[display]	Press and hold to display the secondary display content.	See section 7.7 for details.

Table 5.1 Function Description of Setting Keys of Display Panel

Note: Description of displaying and setting key operation.

(1) The parameter setting in this chapter refers to the operation on the display panel produced by our company, and the touch screen operation is described separately.

(2) The "weighing display state" in this chapter refers to the default state that the instrument has not entered any menu after being powered on.

(3) The key operations in this chapter are uniformly expressed by big square brackets [] and key names, such as [Enter] and [Pxx].

Unless otherwise specified, key operation refers to short press. If it is long press, it will be marked, such as long press [Fxx].

(3) In this chapter, the corresponding digital tube displays are uniformly displayed with small square brackets [] and display contents, such as [d 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
A	b	c	d	E	F	9	H	I	J	K	L	n	n	o	P	r	5	t	U	y

Table 5.2 Display Comparison Table of Digital Tube in Display Panel

Introduction of instrument 2.5

This instrument has two sets of parameters: F parameter and P parameter. The meaning of F parameter is fixed, and it is the internal working parameter and operation item of the instrument. See for details. Section 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 allowed 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	View the second display	×	√	√	√
6	Weighing calibration	×	√	√	√
7	Start and stop process	×	√	√	√
8	Initialize the instrument	×	√	√	√
9	Set timing shutdown	×	×	√	√
10	Set input and output ports	×	×	√	√
11	Consistency calibration	×	×	×	√

Table 3.5 comparison of item operation and password

Note 1: √ indicates the operation items allowed under this level of password login, ×Indicates an operation item that is not allowed

Note 2: some items are realized by f parameter, and the corresponding parameters can only be displayed after logging in the password of this level

Note 3: if the highest bit of f parameter F22 is set to 0 (the factory default value is 1), if there is no login status, the user (user-1) level permission will be obtained automatically, that is, if there is no login in the above table, it will be marked in orange×Can also be operated on

5.4 operation steps of password login

The specific operation steps of password login are as follows:

Key	Lower display	Upper display	meaning

【Fxx】	[F00]	[PP-----]	In the weighing display state, press and hold the [FXX] key, and the lower row will flash. If you are already logged in, the lower row displays [F01]. If it is necessary to switch the login level, you can press the ↓ key to select parameter F00. If you input the current password again, you can enter the password modification function. See section 7.6 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], factory password, dynamic uncertainty
[input]	[F00]	[USEr-1]	According to the different password, the corresponding login prompt is displayed, indicating that the login is successful. After that, enter the weighing status automatically if enter error

Table 5.4 specific operation steps of password login

Note 1: after power on and power on again, log out automatically. If you need to operate the corresponding items again, you need to log in again. If you need to exit the login state when you have logged in, you can also power off and restart the instrument.

Note 2: the password of the manufacturer (user-3) is dynamic. If necessary, please contact us for relevant information.

5.5 f parameter setting and quick reference table

Go to step 1.5.5

(1) In the weighing display status, pressSection 5.4Log in (if you have already logged in, skip this step).

(2) Press and hold the [FXX] key for about 2 seconds, the lower row of the instrument flashes [F01], and the upper row displays [d **]. You can select different parameters for operation by pressing the [↑], [↓] keys, and the label of the current f parameter will be displayed in the lower row.

(3) After selecting the corresponding parameters, press the [Enter] key again to enter the corresponding parameter modification operation. At this time, the lower row does not flicker, but the upper row parameter content flashes, which can be modified by the four keys of [↑], [↓], [→].

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

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

5.5.2 f parameter quick reference table

Lower display	Upper display	meaning
[F00]	[PP -----]	Please enter the login password as shown in section 5.4
[F01]	[d 010]	Division value (01,02,05,10,20,50100 optional)
[F02]	[P 0]	The error code [error, 08] will be displayed if the number of decimal places of weight (0-4 optional) is exceeded
[F03]	[30090]	Scale full scale value (factory default value: [, 030090])
[F04]	[r-o X.Y]	0-cAnnot ZEro 1-1%2-2%3-5%4-10% 5-20% 6-50% ≥7-100% X-StArt UP AUtoñAtIcZEro SEttIng rAnGE(PErcEnt AGEoF ScALE FULL ScALE uALUE) Y-tEYZEror AnGE(PErcEnt AGEoF ScALE FULL ScALE uALUE) For example, 2.5% is set to zero range. Factory default setting is "1.1"
[F05]	[r-A 0.5]	Zero tracking range (setting range: 0.0 ~ 9.9 division values)
[F06]	[ñodE 02]	See Section 7.1 for details
[F07]	[Adr 01]	Communication address (1-26 optional), in continuous transmission mode, it means to select the content to be sent

Quick reference table of group F parameters (continued 1)

Lower display	Upper display	meaning
[F08]	[038400]	2. Baud rate of communication port (600120018002400480096001920038400576001152 00 optional)

[F09]	[FLt 0.0]	1. Scale filter coefficient (0-9 optional, the larger the number, the deeper the filter) After pressing [input], the filter coefficient of [flt-2,0] is displayed After pressing [Enter], it will display [uint, 00.0], and this parameter is for standby	
[F10]	[rt 0.2]	It is recommended to set the stable time to 1.0 seconds	
[F11]	[rF 01]	It is suggested to set it to 1 The larger the value is, the more unstable the weighing is, such as the livestock scale	
[F12]	[cAL-1]	Weighing calibration, see Section 6.1 for details	
[F13]	[**.****]	Test sensor output signal Switch the two groups of sensors through the [→] key The display [1 * *. * *] indicates the millivolts of the first group of sensors The display [2 * *. * *] indicates the millivolts of the second group of sensors	See section 8.1 for details
[F14]	[tESt-dSP]	Display test	
[F15]	[o-000000]	Test output port	
[F16]	[tSt-PSUL]	Test pulse input port	
[F17]	[d **.**.**]	current date	
[F18]	[t **.**.**]	current time	
[F19]	[LInE **]	Set workflow number (factory default 00 means none) 1-14 corresponding to the fixed process listed in the manual No.15 is an empty process. Note: 1-6 is the fixed process of instrument and cannot be modified. 7-15 can receive user written process through serial port. Please refer to relevant process information for details	
[F20]	[dSP1 ***]	In weighing state, display the contents on the upper row of the display panel Press [Enter] to display [KP1,, * *], indicating the content of sub display in the lower row See section 7.7 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,, * *], indicating the content of sub display in the lower row See section 7.7 for details.	

[F22]	[LP *****]	[LP AbcdE] A: Select how to obtain user (user-1) level permissions (1) Short circuit main serial port (NC) and (RXD), (0) password login B: Whether it is allowed to set the formula number (0 - not allowed, 1 - allowed), see relevant information E: (1) remove accumulated control, (2) automatically compensate 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 the 2 ○ analog output port, and 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
[F27]	[no]	Non functional instrument

Quick reference table of group F parameters (continued 2)

Lower display	Upper display	meaning	
[F28]	[SSIo --]	Test communication port, see section 8.1 for details	
[F29]	[AB**]	The version number is displayed, and other relevant contents are displayed in the order of input	
[F30]	[r - cAL]	See calibration results / calculation method weight calibration: After pressing [Enter], the lower row displays [tar-1], and the upper row displays the tare weight of No. 1 scale After pressing [input], the lower row displays [,,, R-1], and the upper row displays No. 1 scale coefficient See Section 6.2 for details	
[F31]	[InIt 0]	Used to initialize the instrument, see Section 8.5	
[F32]	[d-oF]	Special functions: timing shutdown, input and output adjustment	See sections 7.8 and 7.9 for details
[F34]	[tSt- bcd]	(only for instruments with BCD output) Press input, display [B-H*], set to 0: BCD code output, Set to 1: binary code output, set to 2: BCD code reverse output Set to 3: reverse output of binary code Press input and display [BCD **] to enter BCD code output self-test	
[F36]	[Pro9]	The number 6 can be input manually	
[F37]	[rdP1 000]	1. Large screen output Press [Enter] to display [rdp2 000] and set 2 "large screen output content	

		The factory default value is 0, which means there is no output. See Section 7.3 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 follow Section 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.

6Instrument weighing calibration

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
1	F01	10	Grading value
2	F02	0	Decimal digits of weight
3	F03	030090	The full-scale value of the scale
4	F04	1.1	Zero setting range
5	F05	0.5	Zero tracking range
6	F09	1.0	Filter coefficient
7	F10	0.2	Judgment time
8	F11	1.0	Judging range

Table 6.1 F parameters related to weighing

6.1 physical calibration

The physical calibration is divided into two steps, the first step is zero calibration, and the second step is loading point calibration. The weighing operation is above the level of user (User-1), so you must log in with the corresponding password first.

The operation of zero calibration is done directly by pressing the [Zero] button on the panel. If you do not log in with a password, the following operations are manually set to zero. The specific steps are as follows:

Key	Lower display	Upper display	meaning
	[******]	[******]	Make sure there is no weighing object on the scale first.
[set to zero]	[******]	[0]	0 is displayed in the upper row, indicating that the zero point calibration of scale 1# is successful.

Table 6.2 Steps of Zero Point Calibration

After performing the above operations, the user can place the physical objects (weights or materials) with known weights in the appropriate positions on the scale body, and then perform the loading point calibration according to the following

steps:

Key	Lower display	Upper display	meaning
【Fxx】	[F01]	[d ***]	In the weighing display state, press and hold the [Fxx] key to log in.
Press and hold [↑]	[F12]	[cAL-1]	Press and hold [↑] continuously to quickly locate F12.
[input]	[F12]	[cAL-1]	The upper row flashes cal-1, indicating that the loading point is calibrated.
[input]	[F12]	[000000]	Enter the loading point calibration, and the rightmost bit 0 flashes.
Direction key	[F12]	[001000]	Enter the physical weight through the arrow keys, taking 1000 as an example.
[input]	[***]	[1000]	Calibration succeeded.

Table 6.3 Steps of Loading Point Calibration

6.2 calibration by calculation method

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

Calibration coefficient = sum of sensor ranges/sensor sensitivity coefficient

The sum of sensor ranges refers to the cumulative sum of all sensor ranges on the scale, and the units used are consistent with those used in calibration. If three 10-ton sensors are used, the sensitivity coefficient is 2.0mV/V and the calibration division value is 1kg, then the calibration coefficient is 3× 10,000 ÷ 2.0 = 15,000.

The specific operation steps are as follows:

Key	Lower display	Upper 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 administrator level to log in first, and then do this step again.
Press and hold [↑]	[F30]	[r-cAL]	Press and hold [↑] continuously to quickly locate F30.
[input]	[tArE-1]	[0000000]	Set tare weight

Direction key	[tArE-1]	[0000100]	Take 100 as an example
[input]	[r-1]	[010000.0]	Setting calibration coefficient
Direction key	[r-1]	[011000.0]	Take 11000.0 as an example.
[input]	[F30]	[r-cAL]	Calculation method calibration is set successfully.

Table 6.4 Steps of Calculation Method Calibration

Note: Tare refers to the tare value of the empty scale. When the empty scale display is not 0, this parameter can be directly modified. If the current empty scale display is 300, then add 300 to the original value. In those situations where the scale can't be zero-calibrated, you can record the last tare value, and then directly input the setting.

Note: You can also record the calibration coefficient after the last physical calibration and directly enter the setting.

7Setting 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 bits	1-bit/even check	1 bit	See Appendix 3 for the register function table.
	11	8 bits	1-bit/odd check	1 bit	
	12	8 bits	No parity	2 bits	
	13	8 bits	No parity	1 bit	

Table 7.1 Communication Mode Setting Table

7.2 high speed pulse input port as common input port

The high-speed pulse port can be used as a common input port IN11 without any setting, and the corresponding input port is IN7. Because the internal two signal inputs (ADJ,SGN) of the high-speed pulse port are floating, the state of the input port after power-on is random. Just press Section 4.3 After the correct external input is connected, the status is normally available.

7.3 transistor OC gate as large screen output port

As long as any parameter of the 1# large screen output rdP1 and 2# large screen output rdP2 under F37 of F parameter is not 0, the high-speed pulse port will be switched to the large screen output port, and the original stepping motor control or ordinary switch input function will be disabled. P1 and rdP1 can be set as follows:

parameter	Show content	parameter	Show content	parameter	Show content
001	Corresponding variable P01	090	P90 is gross weight 2.	102	P102 is tare weight 1.
002	Corresponding variable P02	091	P91 is the net weight of 2	103	P103 is the flow value.
……	……	100	P100 is gross weight 1.	104	P104 is the range.
093	The variable P93 is the PID output.	101	P101 is net weight 1.	206	P206 is cumulative quantity.

Table 7.2 Parameters and Contents of Large Screen Output Variables

The output port is a current loop, which can be connected to 1-2 large screens. When connecting two large screens, you can either use the series connection method or the parallel connection method. See the wiring method for details. Section 4.4. When using the company's big screens, if two big screens are connected, each big screen can automatically identify its corresponding display variables (see the instruction manual for the setting of the serial number of the big screen), so as to realize the functions of displaying 1# variable on the 1# big screen and 2# variable on the 2# big screen, such as one gross weight and one net weight.

1: when rdP1 is set to 111, the transistor OC gate can only be connected to the stepping motor, but not to the large screen.

Note: For more variables, please refer to related materials of process programming.

7.4 analog output calibration and setting

The instrument has two 4-20mA analog output ports, the corresponding variable of each output port can be set, and the corresponding full range can also be set.

If the 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:

Key	Lower display	Upper 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 administrator level to log in first, and then do this step again.
Press and hold [↑]	[F23]	[A-oUt1]	Press and hold the [↑] continuously to quickly locate F23
[input]	[F23]	[rEP 101]	Display the variable corresponding to the current analog quantity, and P101 is the net weight of the scale
Direction key	[F23]	[rEP 101]	It can be modified through the direction key. See table 7.2 for details
[input]	[F23]	[FUL 104]	20mA corresponds to the quantity. If it is set to 104, it corresponds to the full scale of the scale
Direction key	[F23]	[FUL 104]	Through the direction key modification, the variables are shown in table 7.2
[input]	[F23]	[AdJ1 04]	Analog output calibration, without calibration, press [input] directly At this time, the output port 1 is 4mA Press [↑] to increase the output current value and press [↓] to decrease the current value The output value can be detected by measuring tools such as external meter

[input]	[F23]	[AdJ1 16]	Press the ←] [→] key to input and output value, taking 16 Ma as an example. Press [↑] to increase the output current value and press [↓] to decrease the current value. The output value can be detected by measuring tools such as external meters, and the output value can be detected by measuring tools such as external meters. Through the adjustment of two points, the output accuracy of analog quantity is calibrated
[input]	[F23]	[A-oUt1]	Adjustment completed

3. Specific steps of setting and calibrating the output

Note: 2. The adjustment of analog output port is in F24, and the steps are the same

7.5 analog input port calibration and setting

The instrument has a 4-20mA analog input port, which can be connected with external analog input for input of 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 by the factory). The calibration method is as follows:

Key	Lower display	Upper 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 administrator level to log in first, and then do this step again.
Press and hold [↑]	[F25]	[A-In]	Press and hold the [↑] continuously to quickly locate F25
[input]	[F25]	[04--00.00]	The left side displays the current external input accurate current number, and the right side displays the current value measured by the instrument input port. 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 16 Ma as an example. Press [↑] to increase the output current value and press [↓] 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 change 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:

Key	Lower display	Upper 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-----]	Enter the new password interface, the top row of the right bar flashing display
Direction key	[F00]	[n1*****]	Enter the new password for the first time through the direction key
[input]	[F00]	[r1-----]	Enter the new password interface, the top row of the right bar flashing display
Direction key	[F00]	[r1*****]	Through the direction key, enter the new password again to verify whether it is consistent

[input]	[F00]	[ok1]	OK1 is displayed, indicating that the user password has been changed successfully After 1 second display, it will automatically exit to the weighing display state If it does not match the password entered for the first time, the previous step will still be displayed

Table 7.5 login password modification steps

Note 1: the second login must be the same level password, otherwise it will switch between different login levels, unable to enter the password modification interface.

Note 2: if you forget the login password, please contact us for relevant operation information.

7.7 display content of panel

The display panel is double row digital tube display. In the weighing display state, the specific contents of the display can be set freely. The f parameters involved are F20 and F21.DSP1 in the F20 parameter corresponds to the upper main display, KP1 to the upper secondary display, dsp2 in the F21 parameter to the lower main display and KP2 to the upper secondary display.These four parameters can be set as follows:

serial number	parameter	Show content	serial number	parameter	Show content
1	000	Main display shows 0 / auxiliary display does not display	5	100	Process actuator status
2	001	Strain P01	6	101	Cumulative times
3	……	……	7	102	Accumulated weight
4	099	Strain p99	8	103	Current weight

7.6 variable display and content

Note 1: auxiliary display refers to the content displayed on the display panel when the [display] key is pressed and held in the weighing display state.

Note 2: whether it is the main display or the secondary display, the configuration in the workflow takes a higher priority. If the process has settings, the settings of F20 and F21 parameters are invalid after the process is started (still valid when the process stops).

Note 3: if the password above user-1 level is logged in, there is a fixed second display in the lower row, which indicates the working status of the current process

executor, which is convenient for process debugging. After pressing the second key, the second key is displayed in turn.

7.8 timing shutdown function

The scheduled shutdown function belongs to an administrator (user-2) level or above. You must log in with the corresponding password before the corresponding F32 parameter appears. The following steps assume that you have logged in correctly:

Key	Lower display	Upper display	meaning
【Fxx】	[F01]	[d ***]	In the weighing display state, long press the [FXX] key, and you must log in first
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.
Direction 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 7.7 Operation Steps of Timed Shutdown Function

Note: The following functions are not available once the scheduled shutdown arrives:

Note: Turning off the timed shutdown function means setting the day in the above table to 1366.

7.9 input and output position adjustment

Under normal circumstances, the number of input and output ports in the instrument corresponds to the logo on the host panel one by one. In some special cases, for example, the input and output ports corresponding to the working process are damaged, but the host has idle input and output ports. At this time, you can use the input and output position adjustment function to modify the mapping relationship between the internal number and the external display logo.Achieve the purpose of continuing to use the instrument without modifying the

process.

This function belongs to the project of the administrator (User-2) level or above, and it is in the same F parameter F32 as the scheduled shutdown function set in Section 7.6. When setting the Y4 parameter, it can be changed to 1, and the function can be entered. The following steps assume that the user has successfully logged in and entered the F32 modified project (if not, please refer to the steps in Table 7.3):

Key	Lower display	Upper display	meaning
[input]	[F32]	[Y4 0]	Said whether to enter the input and output adjustment settings.
【↑】	[F32]	[Y4 1]	Select 1 here to enter this function.
[input]	[F32]	[In1 1]	Re-map input port 1, for example, if it is set to 2, it will be mapped to IN2.
[input]	[F32]	[In2 2]	Remapping input port 2
[input]	[F32]	[In3 3]	Remapping input port 3
[input]	[F32]	[In4 4]	Remapping input port 4
[input]	[F32]	[In5 5]	Remapping input port 5
[input]	[F32]	[In6 6]	Remap input port 6
[input]	[F32]	[In7 7]	Remapping input port 7
[input]	[F32]	[In8 8]	Remap input port 8
[input]	[F32]	[oUt1 1]	Re-map output port 1, for example, if it is set to 2, it is mapped to OUT2.
[input]	[F32]	[oUt2 2]	Remapping output port 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]	Remap output 8
[input]	[F32]	[oUt9 9]	Remap output 8
[input]	[F32]	[oUtA A]	Remap output 10
[input]	[F32]	[oUtb b]	Remap output 11
[input]	[F32]	[oUtc c]	Remapping output port 12
[input]	[F32]	[d-oF]	Set up.

Table 7.8 operation steps of input and output position adjustment function

8Instrument detection and other operations

8.1 instrument test function

This instrument has rich test functions, which is convenient for field debugging and use.All test functions are implemented in the f parameter. See section 5.5 for how to enter this parameter.The specific test items are as follows:

serial number	Test items	display	Operation steps
F13	sensor Millivolt number test	[**.****]	Test the output signal millivolts of the sensor, switch the two groups of sensors through the →] key, and test the change and quality of the sensor Display [1 * *. * *], indicating the millivolts of the first group of sensors Display [2 * *. * *], indicating that the number of sensors in the second group is numerous If there is an error code, see Section 8.2 (P20) for the corresponding handling method
F14	Digital tube LED display	[tESt-dSP]	Press [input], the instrument will automatically test led and nixie tube display Check the rolling display visually and judge the display failure
F15	relay Output port	[o-000000]	According to the input and output, the test port can be tested You can also test multiple. If output 2 is tested, input [o-000002];If No. 123 is tested, input [o-000123], and then press [input], the corresponding output port will act, and at the same time, the indicator light on the front panel will be on, and after the test, press [o-000123] Cancel to exit the test
F16	High speed pulse Input port	[tSt-PSUL]	At this time, press [a] to input the pulse number, and the input signal will be displayed Cancel to exit the test
F26	Internal RAM	[tSt- rAn]	Press [Enter], if there is no fault, [good ram] will be displayed Otherwise [bad] is displayed

F28	2. Communication port	[SSIo --]	The detection method is to short circuit the two signal lines RXD and TXD of RS232 communication, and the display: [ssio 1 -] indicates that RS232 communication is normal. Connect 0.1uF capacitor between two signal lines a and B of RS485 communication, and display: [ssio - 2] indicates that RS485 communication is normal

Table 8.1 table of test function items

8.2 instrument post 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 instrument will start self-test. If any error is found, the error code number will be displayed, and multiple errors will be displayed for a certain time in turn, and then enter the normal working cycle. If the process number is set, the instrument will display the error code number, The corresponding workflow will be started automatically.

There are button batteries inside the instrument to save the working state before power down, and these States will be recalled after power on. For the workflow, after power on, the process controller will perform a power on trigger function, if the process has corresponding operation, it will execute.

After the power supply is connected, if all the following conditions are met, the instrument will carry out a weight zero setting, which is the start-up zero setting:

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

(2) Stable data can be collected within 6 seconds after power on

(3) The weight value is within the range of starting zero (see f parameter quick reference table f04)

8.2.1 startup fault code

The following error codes may be displayed during the self-test after the instrument is powered on:

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]	Sensor failure	Check the sensor, main line, terminal connection line and junction box.
3	[Err220]	Undervoltage supply	Check the supply voltage

Table 8.3 Fault display codes in use

8. Total weight and total gauge clearance

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:

Key	Lower display	Upper display	meaning
[set to zero]	[***]	[***]	In the normal weighing state, wait for the weight to stabilize (the stabilizing light is always on). Press [set to zero]
	[***]	[0]	(This is assuming that the gross weight/net weight 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.

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:

Key	Lower display	Upper display	meaning
[clear]	[ ]	[SUrE 0]	In the normal weighing state, press and hold [Zero] 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:

Key	Lower display	Upper 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.
[Cancel]	[***]	[*****]	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.

9appendix

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	44		03
Ascii format		A	D		

Slave answer:

content	XON	ADD	CMD	DATA	CHK	XOFF
				ijkl		
Hex format	02	41	64			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	4B			03
Ascii format		A	K			

Slave answer:

content	XON	ADD	CMD	DATA		CHK	XOFF
Hex format	02	41	6B				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	51		03
Ascii format		A	Q		

Slave answer:

content	XON	ADD	CMD	DATA		CHK	XOFF
Hex format	02	41	71				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	54			03
Ascii format		A	T			

Slave answer:

content	XON	ADD	CMD	DATA		CHK	XOFF
				xxx	dddddddd		
Hex format	02	41	74				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	55			03
Ascii format		A	U			

Slave answer:

content	XON	ADD	CMD	DATA		CHK	XOFF
Hex format	02	41	75				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	76				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	77				03
Ascii format		A	w	o	k		

Appendix 2 continuous transmission mode command

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)	A's command returns
2	Yaohua old D2 + format	=51.0700=51.0700……	8 bytes per frame
3	/		
4	Toledo standard format		Without checksums
5	Toledo standard format		With check sum
6	1705 format	ST,GS,+0012.34,kg(CRLF) US,GS,-002000,kg(CRLF)	
7	Top song scheme 2	(STX)AA±nnnnnnptttttteff(CHK)(ETX)	
8	/		
9	/		
10	/		
11	Taiwan c-8500ts Umc600 format	(STX)- 12.34KGM(CRLF)	
12	XK3190-A9 mode	(STX)-002000PCC(ETX)	Yaohua
13	/		
14	HBM we2110 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
20	Ex2001 format	ST,GS,+0012.34kg(CRLF)	Similar to 1705 format, there is

			no comma for the 15th word
21	Toledo compact format		With check sum
22	Toledo compact format		Without checksums
23	Asano format		Change the check sum of simplified format with Toledo to [OA]

Appendix Table 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 setting 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 range	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	Int1-8, output: int1-8	2 bytes, unsigned, read-only
4x0249	(d0-d15): whether the formula can be set, IO test, zero position 2 Zero 1, stable 2, stable 1, peeled 2, peeled 1 OUT9-OUT16	2 bytes, unsigned, read-only
4x0250	Current ad value of scale 2	4 bytes, signed, read-only
4x0252	Zero point calibration ad value of No.2 scale	4 bytes, unsigned, read/write
4x0254	Calibration factor of scale 2	4 bytes, unsigned, read/write

Appendix Table 1: Modbus RTU function code

Note 1: if the register address is orange, it means that it has been adjusted in 2016. Please check it again before use

Note 2: the maximum number of block read bytes is 120

Note 3: the register (4x0212) is the panel key number. Writing a number to the register means pressing a certain key, which can be an entity key or an internal function key. See the table below for details:

serial number	Schematic value	Actual write value	Corresponding function
1	128+1	129	Press the short key of the instrument
2	128+2	130	Short press the ↓ key of the instrument
3	128+3	131	Short press the ←] key of the instrument
4	128+4	132	Short press the →] key of the instrument
5	128+5	133	Short press the [Enter] key of the instrument
6	128+6	134	Short press the [Cancel] key of the instrument
7	128+7	135	Printing
8	128+8	136	print the report
9	128+9	137	Print custom documents
10	128+10	138	Scale calibration
11	128+11	139	Press and hold the [↑] key of the

			instrument, which is equivalent to the [stop] key
12	128+12	140	No such function
13	128+13	141	Press and hold the [←] key of the instrument, 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	No such function
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
V1.0.0	2018-02-07	1. Instrument resources have been modified. 2. The analog input and output ports are added, and the stepping motor is connected. 3. The adjustment method of analog input and output ports is added.	Bao Feiping