Multifunction Programmable Weighing Controller

DS822-P8S(4821)

Manual

(Chinese version V1.0)

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Menu

I. Introduction

DS822-P8S(4821) is a single-scale split programmable weighing controller, which can be connected to one load cell. The host machine is installed in a standard guide way, and can be directly connected to the touch screen as a 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 be connected with the following signals:
passive switches, buttons and relay outputs;
Or NPN PNP transistor switch input; DC voltage signal, voltage range 6-24V

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

(3) 8 relay outputs, contact capacity: AC220V,5A or DC30V,5A

(4) Two OC gate outputs can control the stepping motor: OUTA stepping motor pulse and OUTB stepping motor direction.

(5) Two 4-20mA analog outputs and one 4-20mA analog input.

(6) One high-precision conversion AD can be connected with one load cell.

(7) Two communication interfaces

One channel can be connected with RS485/RS232 signals. Communication mode, address and baud rate can be set. Top loose protocol, standard Modbus RTU protocol and multiple continuous transmission modes can be selected. It can communicate with computers, PLC and other equipment.

An independent RS232 interface, the communication protocol can be configured at will.

(8) 1 channel large screen output interface (multiplexed with OC gate output outlet OUTB, and only one function can be selected at the same time)

It can be connected to one or two large-screen monitors produced by our company, and the transmission distance can reach more than 1000 meters.

(9) 1 USB interface

(10) Flexible and reliable programmable function, suitable for a variety of applications, users can make secondary programming, which can be finished in simple and convenient way.

At the same time, it can realize the protection of users' intellectual property rights.

main performance index

(1) A/D input signal range: -20mV~+20mV (the sensitivity of the sensor can reach up to 4mV/V)

(2) Internal resolution of A/D: 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%

II. Structural dimensions of main engine and accessories

2.1 Instrument installation dimension drawing (unit: mm) Opening dimension: (length) 188mm x (height) 113mm

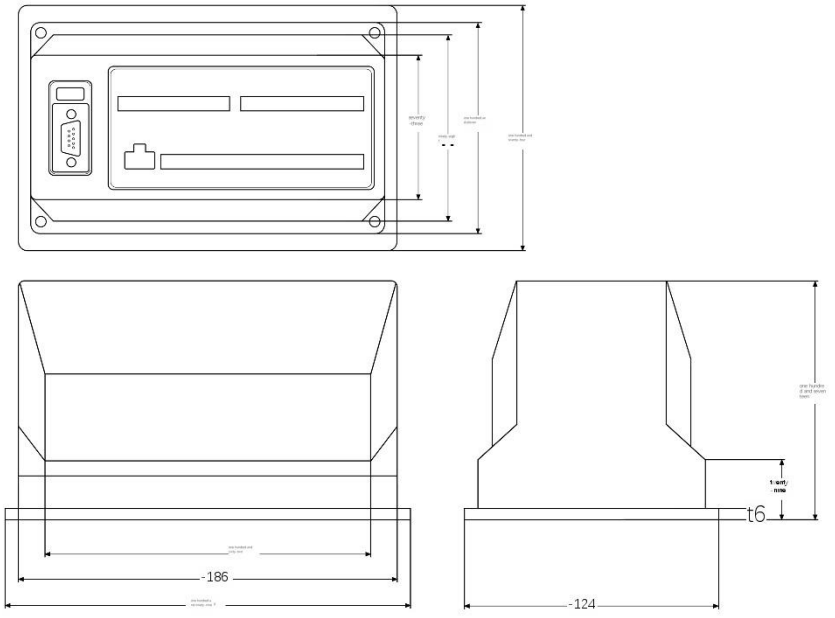


Figure 2.1 Installation Dimensions of Host

III. Interface Layout of Host and Accessories

3.1 Instrument interface layoutpicture

Switching value input port

analog quantit

analog quantity

Relay output

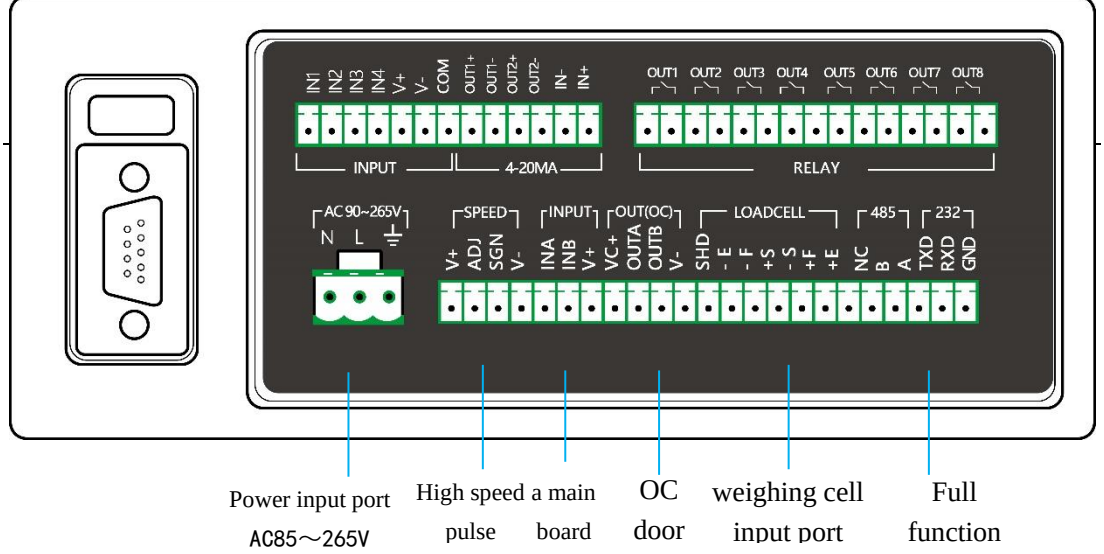


Figure 3.2 Functional Schematic Diagram of B Side of Host Panel

Note: Outlet OUTA(OUT9) and OUTB(OUT10) 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.

IV. Connection method of instrument port

4.1 common 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.

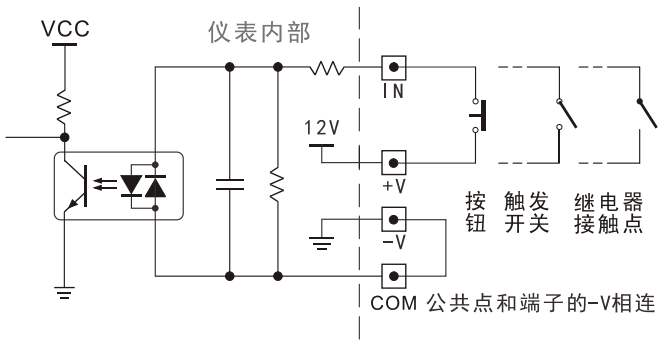


Figure 4.1 Schematic diagram of switch input connection

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.

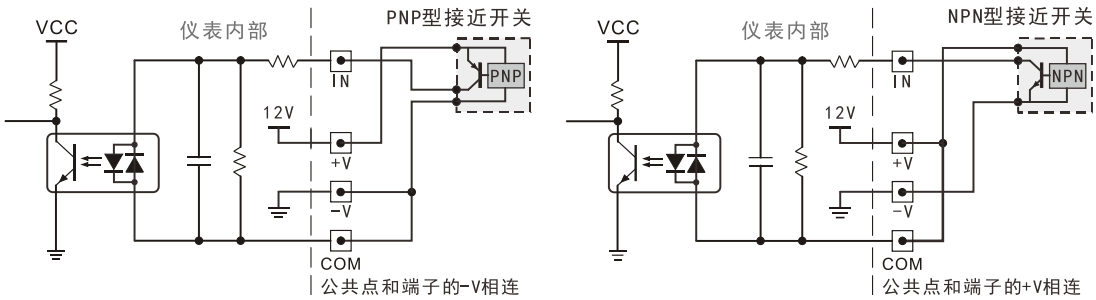


Figure 4.2 Schematic diagram of PNP proximity switch connection Figure 4.3 Schematic diagram of NPN proximity switch connection

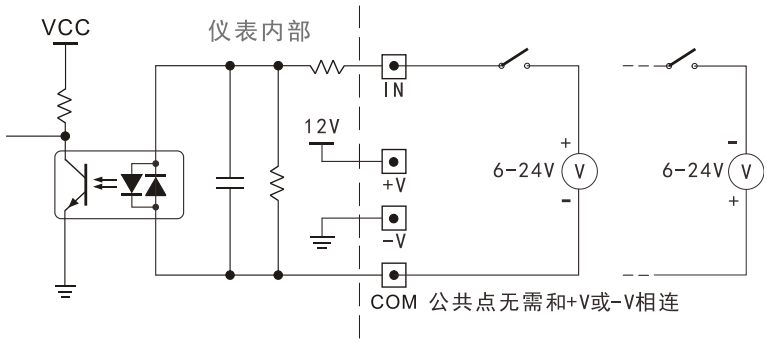


Figure 4.4 Schematic diagram of DC voltage signal input connection

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.

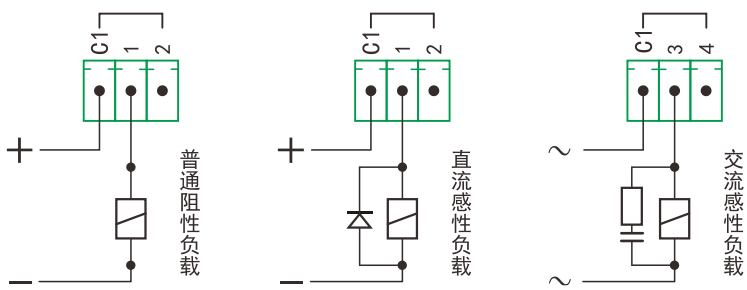
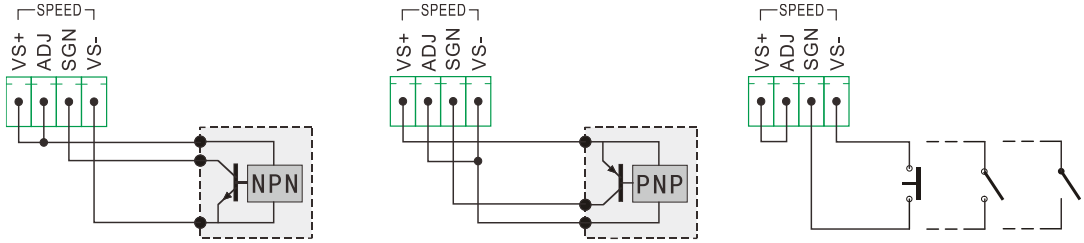


Figure 4.5 Schematic diagram of relay output connection

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.

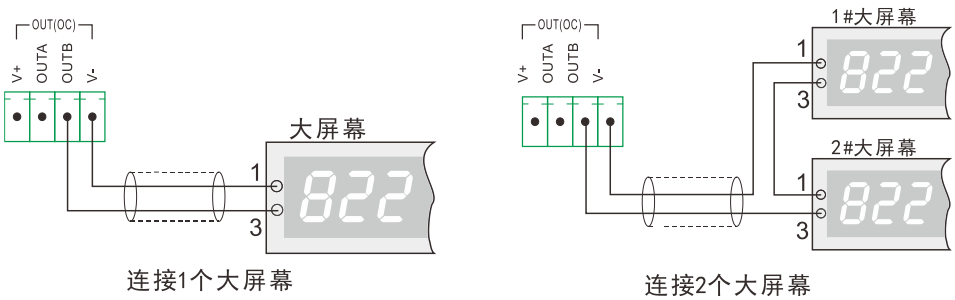


NPN型测速传感器　　PNP型测速传感器　　作普通开关量输入口用

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

4.4 The transistor OC gate is connected to the 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.



连接1个大屏幕　　连接2个大屏幕

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.

4.5 transistor OC gate controls stepping motor

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 The OC gate of the transistor is used as a common output port.

output	OC door	There are two channels of OC gate NPN OUT9,OUTB (OUTA corresponds to out9 and outb corresponds to OUT10), and the contact capacity is 24v and 60ma, which can be connected to external relay, PLC input port, etc. See the following figure for the wiring method.

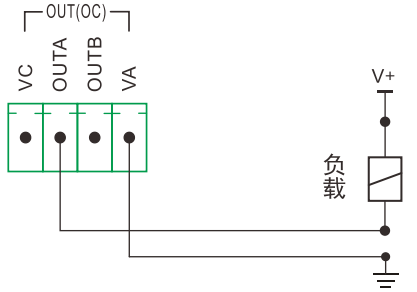


Fig. 4.8 schematic diagram of output connection of npn OC gate

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.

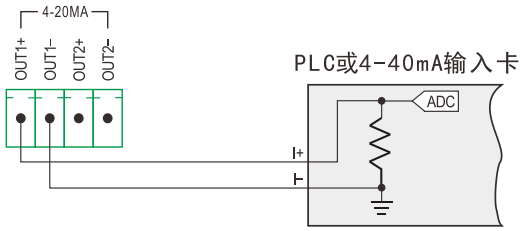


Figure 4.9 Schematic diagram of 4.9 4-20mA analog output connection

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.

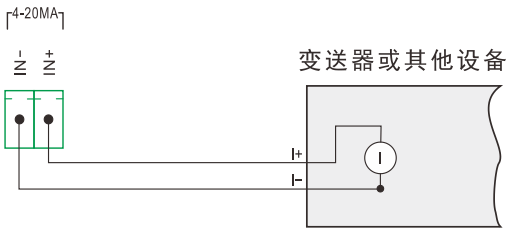


Figure 4.10 Schematic diagram of 4.10 4-20mA analog input connection

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

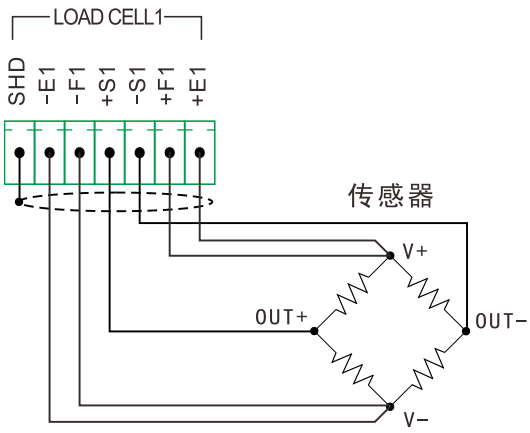
Table 4.1 Label and function of load cell interface

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.



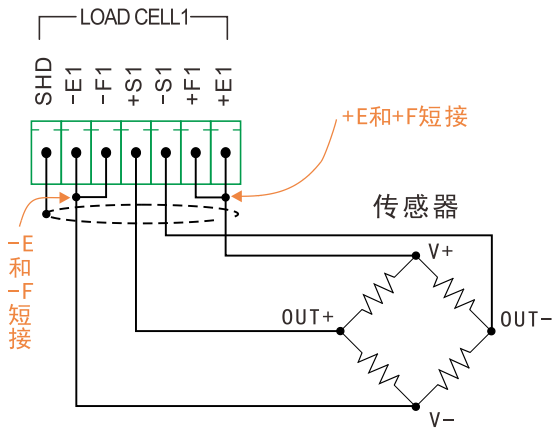


Figure 4.12 6-wire connection method of load cell Figure 4.13 4-wire connection method of load cell

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.

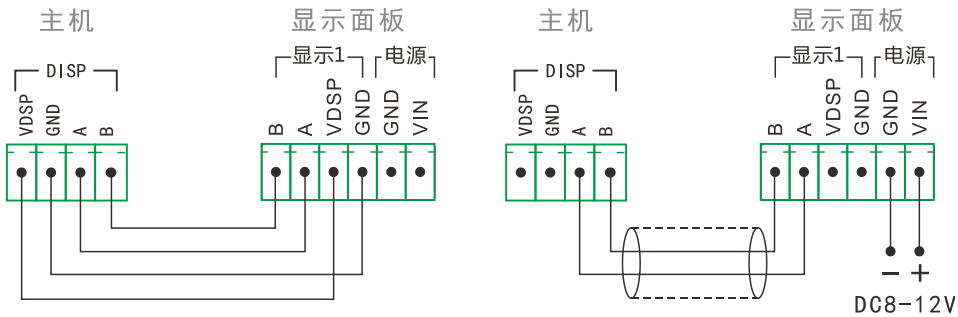


Fig. 4.15 Connection Method between Host and Display Panel

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.

V. Parameter setting

5.1 Function and operation of setting buttons on the display panel

such asFigure 3.3As you can see, the display panel has 6 independent setting keys, each of which has two names, and performs different functions under different conditions.At this time, press a short key, and then press a short beeper.If you press and hold a key for more than 2 seconds,If you do not release the buzzer until you hear it for a long time, you will enter the key continuous operation mode if you still do not release it at this time.The functions of the six buttons are as follows:

serial number	Key Icon	Key name	function	remarks
1		【↑】	Set the current menu item to scroll up Set target number plus 1	
		[start]	Start the selected process Long press means stop and exit the process	See the relevant process information for details
2		【↓】	Set the current menu item to scroll down Set target number minus 1	
		[peeling]	Manual peeling	
3		【←】	Sets the currently selected number to shift left	
		[zero setting]	Zero or zero calibration Long press to clear the accumulated quantity	See section 8.3 / 6.1 for details See8.3section
4		【→】	Set the currently selected number to move to the right.	
		【Pxx】	Long press to enter the p parameter setting.	SeeSection 5.5

5	输入 Fxx	[input]	Confirm the current parameter setting	
		【Fxx】	Long press to enter f parameter setting.	SeeSection 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

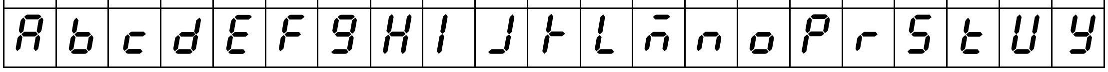


Table 5.2 Display Comparison Table of Digital Tube in Display Panel

5.2 Introduction of instrument parameters

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 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 7.6 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], 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 bESEttoZEro1-1%2-2%3-5%4-10% 5-20% 6-50% ≥7-100% X-AUto-ZEroIn9rAn9EAt PoUEr-on(PErcEntA9EoFtHEFULL-ScALE uALUEoFtHEScALE) Y-tEYZErorAn9E(PErcEntA9EoFScALEFULLScALEuALUE) 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]	[nodE 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 row display	Upper row display	meaning
[F08]	[038400]	2. Baud rate of communication port (6001200180024004800960019200384005760011520 0 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 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 7.7 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, * * *], which indicates the content displayed in the lower row. See section 7.7 for details.	

[F22]	[LP *****]	[LP 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.
[F27]	[no]	Non-instrument function

Quick Table of Group Parameters (Continued 2)

Lower row display	Upper row display	meaning	
[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 calibration results/calculation method for weight calibration: Press [Enter] to display [tare-1] in the lower row, and the tare weight of scale No.1 in the upper row. Press [Enter] to display [,,,,R-1] in the lower row, and scale coefficient No.1 in the upper row. 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: timing shutdown, input and output adjustment.	See sections 7.8 and 7.9 for details.
[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	

5. Speedometer

5.5 P parameter setting

Enter the following steps to set the parameters:

(1) Press and hold the [Pxx] key for about 2 seconds, the lower row of the instrument will flash [p * *], and the upper row will display [,, * *], (the specific content depends on the process).Different parameters can be selected for operation by pressing the key [↑], [↓]. At this time, the label of the current f parameter will flash in the lower row.

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

(3) After 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 to the previous menu.

Note 1: some parameters are set as control parameters by the processSection 5.4The method described in this paper is to log in first. If you have already logged in, all P parameters that can be set will be displayed automatically.

Note 2: for the specific meaning of P parameter, please refer to the corresponding process information.

VI. Weighing and calibration of instruments

When the instrument is used for the first time or after using for a period of time, the weighing error is large, so it is necessary to carry out weighing calibration.The instrument can be calibrated in kind, and the calculation method can be used in some cases where the physical calibration cannot be carried out.If it is the initial calibration, the user needs to set the f parameters related to weighing before entering the formal calibration step,The parameters involved are:

serial number	F parameter	Default value	meaning
1	F01	10	Division value
2	F02	0	Decimal places 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	Filtering coefficient
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 Physical calibration

The physical calibration is divided into two steps. The first step is zero point calibration, and the second step is loading point calibration.Weighing calibration operation is a user-1 level or above project, you must use the corresponding password to log in.

The operation of zero point calibration is completed directly through the panel button [zero]. If you do not log in with a password, the following operations are performed manually.The specific steps are as follows:

button	Lower row display	Upper row display	meaning
	[******]	[******]	Make sure that there is no weighing material on the scale
[zero setting]	[******]	[0]	The upper row displays 0, indicating that the zero point calibration of 1 9 scale is successful

Table 6.2 steps of zero point calibration

After performing the above operation, the user can place the material object (weight or material) with known weight in the appropriate position on the scale body, and then perform the loading point calibration according to the following

steps:

button	Lower row display	Upper row 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 locate F12
[input]	[F12]	[cAL-1]	Cal-1 is flashing in the upper row, indicating that the loading point is calibrated.
[input]	[F12]	[000000]	Enter the loading point calibration, the rightmost bit 0 flashes
direction key	[F12]	[001000]	Input the weight of the object through the direction key. Here, take 1000 as an example
[input]	[***]	[1000]	Calibration successful

Table 6.3 steps of loading point calibration

6.2 Calculation method calibration

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:

Calibration factor = sum of sensor range / 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 value is 1kg, then the calibration coefficient is 3×10000÷2.0=15000

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]	[r-cAL]	Press and hold the [↑] 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]	Set calibration factor
direction key	[r-1]	[011000.0]	Take 11000.0 as an example
[input]	[F30]	[r-cAL]	The setting of calculation method calibration is successful

Table 6.4 steps of calculation method calibration

Note 1: tare weight 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 displays 300, then add 300 to the original value. In those cases where it is impossible to calibrate the scale zero point, the tare value of the last time can be recorded, and then the setting can be input directly.

Note 2: you can also record the calibration coefficient after the last physical calibration and input the setting directly.

VII. Setting of other working parameters

7.1 Parameter setting and protocol of full-function communication port

2. The communication port is a full-function communication port. The communication mode, address and baud rate can be set. It supports top loose protocol, 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 toSection 5.5。The communication mode F06 determines the protocol currently used by the communication port. See the table below for details.

Protocol type	Communication mode F06	Communication data format			remarks
		Bit data	Check bit / mode	Stop bit	
Top loose agreement	0	7-bit ASC code	1 bit / even check	1	The protocol is command response. When F06 = 3, check word (chk) is not checked when receiving data. See Appendix 1 for details
	1	7-bit ASC code	1 bit / odd check	1	
	2	8-bit ASC code	No check	1	
	3	7-bit ASC code	1 bit / even check	1	
Continuous transmission mode	4	7-bit ASC code	1 bit / even check	1	Send every 35ms See Appendix 2 for details
	5	7-bit ASC code	1 bit / odd check	1	
	6	8-bit ASC code	No check	1	
Serial port printout	8	8-bit ASC code	No check	1	Input busy signal is high (common)
	9	8-bit ASC code	No check	1	The input busy signal is low
Modbus RTU	10	8	1 bit / even check	1	See Appendix 3 for register function table
	11	8	1 bit / odd check	1	
	12	8	No check	Two	
	13	8	No check	1	

7. Communication table 1

7.2 High-speed pulse input port shall be a common input port.

High speed pulse port can be used as common input port in11 without any setting, and the corresponding input port is in7. Since the two signal inputs (adj, SGN) inside the high-speed pulse port are suspended, the state of the input port after power on is random. Just press Section 4.3 After the external input is correctly connected, the state is normally available.

7.3 Transistor OC gate is used as large screen output port.

As long as any parameter of 1 × large screen output content rdp1 and 2 × large screen output content rdp2 under f37 of f parameter is not 0, the high-speed pulse port is switched to large screen output port, and the original stepper motor control or ordinary switch input 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	5	100	Gross weight
2	001	Strain P01	6	101	Net weight
3	……	……	7	102	tare
4	099	Strain p99	8	103	Flow value

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 ๑ variable and 2 ๐ large screen displaying 2 ๐ variables, such as one displaying gross weight and one displaying 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 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]	Displays the variable corresponding to the current analog quantity.
direction key	[F23]	[rEP 102]	It can be modified by the arrow keys, taking 102 as an example. See Table 7.2 for variables.
[input]	[F23]	[F 000000]	20mA corresponds to the total amount; if set to 0, it corresponds to the full scale of the system.
direction key	[F23]	[F 015000]	Enter the corresponding weight of 20mA, taking 15000 as an example.
[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	[F23]	[A-In]	Press and hold [↑] continuously to quickly locate F25.
[input]	[F23]	[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]	[F23]	[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]	[F23]	[A-In]	Adjustment completed.

Table 7.4 Specific steps of analog input port calibration and setting

7.6 Modify the login password

And the passwords of users and administrators can be modified, while the passwords of manufacturers are dynamic and cannot be modified. As long as you log in for the second time with the correct password, 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 for a long time, and the lower row will flash. If [F00] is displayed in the lower row. Then enter the password to modify the level, log in first, and then do this step again.

【↓】	[F00]	[PP-----]	Select login again.
[input]	[F00]	[PP-----]	After pressing the enter key, the rightmost 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 7.5 login password modification steps

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.

7.7 Settings of panel display content

The display panel is double-row nixie tube display. In the weighing display state, the specific content of the display can be freely set, 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 7.6 shows variable parameters and contents.

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.

7.8 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 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]	Enter the set timing days (take 100 days as an example) 1-1365 optional, 1366 means unlimited length (i.e. no timing shutdown function)
[input]	[F32]	[Y1 0]	express
[input]	[F32]	[Y2 0]	
[input]	[F32]	[Y3 0]	
[input]	[F32]	[Y4 0]	Indicates whether to enter the input / output adjustment setting. Select 0 here
[input]	[F32]	[d-oF]	Set up

Table 7.7 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

7.9 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 it is the same as that of 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 table 7.3)

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]	[oUt1 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]	The remapping output port 4
[input]	[F32]	[oUt5 5]	Remap output port 5

[input]	[F32]	[oUt6 6]	The remapping output port 6
[input]	[F32]	[oUt7 7]	The remapping output port 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 7.8 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
F13	sensor Millivolt number test	[**.****]	Test the millivolts of the sensor output signal, and switch the two groups of sensors with the → key to test the change and quality of the sensors. [1 **.****] is displayed, indicating the millivolts of the group 1 sensor. [2 **. ***] is displayed, indicating that there are no sensors in the 2nd group. If there is an error code, please refer to Section 8.2 (P20) for the corresponding treatment method.
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 [a 000000]. 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	Return to factory for repair
2	[Epr 2]	Power failure detection failure	Check whether the input voltage is normal
3	[Epr 3]	Internal RAM data loss	Check if the button battery on the motherboard is dead
4	[Epr 4]	Internal ROM data loss	Return to factory for repair
5	[Epr 5]	Internal program data error	Return to factory for repair
6	[Epr 20]	Internal clock	Check if the button battery on the

		error	motherboard is dead

Table 8.2 startup fault display code

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 factor on the scale
2	[Er1 06]	Sensor failure	Check the sensor, main line, terminal connection line and junction box
3	[Err220]	Under voltage power supply	Check the supply voltage

Table 8.3 failure display code in use

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

Manual instrument zero setting

After the instrument has been used for a period of time, due to various reasons, the zero point may shift to a certain extent, which requires manual zero setting operation. Without logging in any level password, the weight range of zero setting operation needs to meet the requirements of parameter f04.The specific operation steps are as follows:

button	Lower row display	Upper row display	meaning
[zero setting]	[***]	[***]	In the normal weighing state, wait for the weight to be stable (the stability light is always on) Press [set to zero]
	[***]	[0]	(this is assuming that the upper row shows gross / net weight)

Table 8.4 operation steps of manual zero setting

Note 1: if it is unstable or the current weight is beyond the range of zero setting, zero setting is invalid.

Note 2: after the zero operation is successfully completed, the current tare value corresponding to the corresponding scale number will also return to zero.

Note 3: after logging in the password of user-1 or above, the range of zeroing is unlimited, and the zero setting operation is equivalent to
The zero point calibration is carried out.

8.3.2 cumulative clearance

In some workflow, the 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
[clearing]	[ ]	[SUrE 0]	In normal weighing state, press and hold [set to zero] for more than 2 seconds
【↑】	[ ]	[SUrE 1]	Enter 1 to select the clear accumulation operation
[input]	[***]	[*****]	After clearing the accumulated quantity, it will return to the weighing state automatically

Table 8.5 operation steps of removing accumulated amount

8.4 Start and Exit of Process

By default, the process number parameter F19 of the instrument is 00, which means there is no workflow.Only when the corresponding instrument number is set can the user enter the corresponding work flow.Users can choose the fixed working process built in the instrument, or burn it into the instrument through the serial port through the computer software.(see relevant information of the process for details)

Generally, if the process number is set, the workflow will be started automatically after the instrument is powered on and started, without manual intervention.However, in some debugging States, it may be necessary to start or stop the workflow manually.This function belongs to the user (user-1) or higher level function, which requires corresponding login first.After login:

Press the [start] key to start the workflow

Long press the [start] key for more than 2 seconds (equivalent to the [stop] key) to stop the workflow.

8.5 Restore factory settings.

The user-1 password has been set to factory successfully

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 user level, log in first, and then perform this step again
Press and hold	[F31]	[InIt 0]	Press and hold continuously to locate f31

【↑】	[F31]	[Init 1]	Enter 1 to select the initialization operation
[input]	[F31]	[Init ok]	Indicates that initialization is complete
[Cancel]	[***]	[*****]	Exit setup menu

Table 8.6 operation steps of restoring factory settings

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

IX. Appendix

Appendix 1 Top Loose Communication Protocol

Top song communication protocol is a master-slave protocol based on the ASCII code byte. Each lower computer (instrument) has a unique address. The upper computer sends instructions to the lower computer with the specified address. After receiving the command, the lower computer will return the corresponding information if it is verified correctly.If the upper computer receives the correct answer, it will be regarded as communication timeout if it is not received for a certain period of time.

1. Protocol data frame format

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	Working parameters	Bit	Working parameters
0	=Relay 1 is working	0	=1 indicates that external input 1 has signal
1	=1 means relay 2 is working	1	=1 indicates that external input 2 has signal
2	=1 means relay 3 is working	2	=1 indicates that external input 3 has signal
3	=1 means relay 4 is working	3	=1 indicates that external input 4 has signal
4	=1 means relay 5 is working	4	=There is an external input signal No. 5
5	=1 means relay 6 is working	5	=1 means external input No.6 has signal
6	Constant is 1	6	Constant is 1
7	Check bit	7	Check bit
The meaning of each binary bit of C			
Bit	Working parameters		
0	=1 means external input No.7 has signal		
1	=1 indicates that external input No. 8 has signal		
2	=1 means relay 7 is working		
3	=1 means relay 8 is working		
4	=1 means peeling		
5	=1 is stable		
6	Constant is 1		
7	Check bit		

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	Work parameters	Bit	Work parameters
0	=1 indicates that external input 1 has signal	0	=1 means external input No.7 has signal
1	=1 indicates that external input 2 has signal	1	=1 indicates that external input No. 8 has signal
2	=1 indicates that external input 3 has signal	2	=Relay 1 is working
3	=1 indicates that external input 4 has signal	3	=1 means relay 2 is working
4	=There is an external input signal No. 5	4	=1 means relay 3 is working
5	=1 means external input No.6 has signal	5	=1 means relay 4 is working
6	Constant is 1	6	Constant is 1
7	Check bit	7	Check bit
The meaning of each binary bit of k		The meaning of each binary bit of l	
Bit	Work parameters	Bit	Work parameters
0	=1 means relay 5 is working	0	=1 indicates that relay No.11 works.
1	=1 means relay 6 is working	1	=1 indicates that relay No.12 works.
2	=1 means relay 7 is working	2	=1 indicates that relay No.13 works.
3	=1 means relay 8 is working	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	Constant is 1		6	Constant is 1
7	Check bit		7	Check bit

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 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: if you need contact details in the format.

Appendix 3 Modbus RTU communication function code table

Function address	meaning		Register properties
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 2)		4 bytes, signed, read-only
4x0180	Parameter: P91 (net weight of scale 2)		4 bytes, signed, read-only
4x0182	Parameter: P92 (tare weight of scale 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, no sign
	Bit 2	Output relay out2 status	
	…	…	
	Bit 16	Output relay Out16 status	
4x0199	Bit 1	Enter IN1 status	2, no sign
	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, no sign
4x0201	Last stored item		2, no sign
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	Division 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)

Function address	meaning	Register properties
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, no sign
4x0230	Working state of 2# process executor	2, no sign
4x0231	Working state of 3# process executor	2, no sign
4x0232	Working state of 4# process executor	2, no sign
4x0233	Working state of 5# process executor	2, no sign
4x0234	Working state of 6# process executor	2, no sign
4x0235	Working state of 7# process executor	2, no sign
4x0236	Working state of 8# process executor	2, no sign
4x0237	Working state of 9# process executor	2, no sign
4x0238	Working state of 10# process executor	2, no sign
4x0239	Working state of 11# process executor	2, no sign
4x0240	Working state of 12# process executor	2, no sign
4x0241	Display panel digital tubes DSSP1,DSSP2	2, no sign
4x0242	Display panel digital tubes DSSP3,DSSP4	2, no sign
4x0243	Display panel digital tubes DSSP5,DSSP6	2, no sign
4x0244	Display panel digital tube DSSP7,DSSP8	2, no sign
4x0245	Display panel digital tube DSSP9,DSSP10	2, no sign
4x0246	Display panel digital tube DSSP11,DSSP12	2, no sign
4x0247	Display panel digital tube DSSP13,DSSP14	2, no sign
4x0248	Output status (D0-D15):IN1-IN8,OUT1-OUT8	2, no sign
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, no sign
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

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 [Pxx] key
15	128+15	143	Press and hold 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	Connect out1
21	256+2	148	Connect out2
……	……		
39	256+20	276	Connect out20
40	288+1	289	Off out1
41	288+2	290	Off out2
……	……		

59	288+20	306	Off out20

Appendix Table 2: register (4x0212) values and functions

Revision history:

edition	date	Revision	Reviser
V1.0.0	2018-02-07	1. Instrument resources are modified 2. Add analog input and output port, step motor connection The method of input and output adjustment is added	Bao Feiping