Intelligent Weighing Controller

MODBUS -RTU(AC/DC)

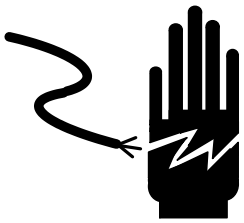
User Manual

(AC / DC share specification)

MK360

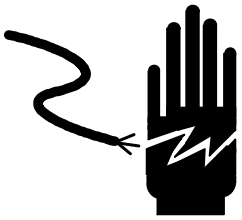
Please read this manual carefully before using.

Please keep this product manual well for future reference.



WARNING

There is AC high voltage inside the controller, please debug, test and repair the controller.



WARNING

To ensure the safety of the operator and the stable and reliable performance of the controller, always keep the controller well grounded.

PAY ATTENTION TO

When connecting the controller electronically, please cut off the power supply in advance, and please wait for 30 seconds to power on the controller before powering on the instrument.

PAY ATTENTION TO

This controller is a weight transmission control device and cannot be used as a measuring instrument for trade settlement.

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1 Overview

The controller is a transmission display controller (hereinafter referred to as the controller). It integrates weight display, analog signal output, Modbus-RTU communication, large screen communication, switching input and relay output. Using a high-speed 24-bit Σ - Δ A / D converter, 16-bit D / A converter, all interfaces through photoelectric isolation treatment. Fully considering the complexity of electromagnetic interference in the industrial field, carefully designed hardware and software, suitable for industrial field applications in building materials, chemical industry, grain, metallurgy and other industries.

1.1 Type selection and interface configuration

model	Sensor interface	Entry switch	Output relay	Large screen	Gorge line	Analog quantity
2A	One	One	2 Road	have	have	have
2C	One	One	2 Road	have	have	not have
4A	One	Four	4 Road	have	have	have
4C	One	Four	4 Road	have	have	not have

1.2 The main characteristics

- Internal anti-EMC interference circuit, anti-electromagnetic interference ability is strong, stable data, suitable for industrial field applications.
- Three calibration methods: weight calibration, calibration parameter modification, sensitivity input calibration (no weight calibration).
- RS232 or RS485 two options, support Modbus-RTU communication multi-word continuous reading and writing function.
- Analog output types can be set: 0 ~ 20 mA, 4 ~ 20 mA, 0~5V, or 0~10V.
- The relay output mode can be set: sorting, fixed value, quantitative, reduction, ingredients, peak and other modes.
- When the actual feeding weight is too poor, automatically start the point feeding.
- Support the upper computer to calibration the controller.
- The number of cycle ingredients can be set, and the unlimited cycle ingredients are supported.
- Cumulative function of ingredient times, actual ingredient weight upper machine reading function.
- Support the upper machine communication zero, peeling, ingredients start and stop a series of operations.
- Stainless steel anticorrosion panels, all-metal shield case.
- Σ24 BIT- △ Type A / D conversion, maximum number of A / D pulses: 1,000,000.
- AD rate is optional: 30 / s, 50 / s, 100s, 200 / s, 400 / s.
- 7-bit 0.56-inch LED digital tube display, 10-segment light column indication, 7 LED indicators.

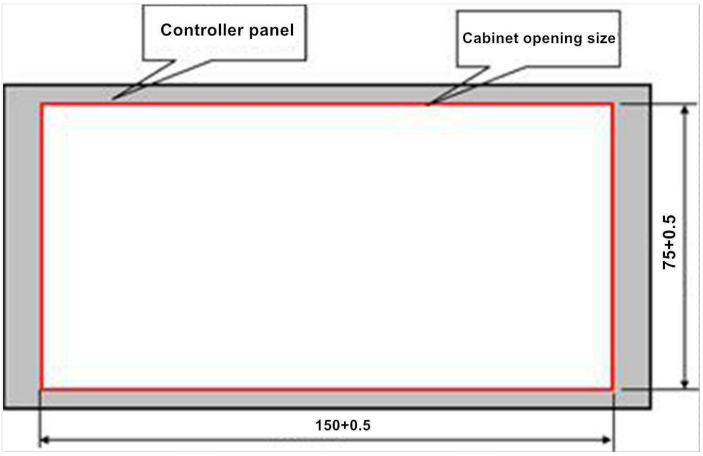
1.3 Technical parameters

- Ω Incentive voltage: 5.0VDC, which can drive 8350 analog sensors.
- Range signal range: 1.5 ~ 40 mV.
- Zero-point signal range: -40~38.5mV.
- Analog current output: Max 500Ω.
- Analog voltage output: Min 10 KΩ.
- Relay contact capacity: AC 3A / 250V, DC 3A / 30V.
- Highest sensitivity: 0.1 uV / d; Nonlinear: better than 0.01%FS.
- Power supply voltage range: AC 200~240V, frequency 50Hz, maximum power consumption of 8 watts. The controller needs a good grounding wire, and should not share a power supply with the motor, relay or heater and other equipment easy to produce power noise.**(DC is DC24V input)**
- The temperature is-20℃ ~50℃, humidity is 10%~95%, no condensation.

2 installation and debugging

2.1 Controller dimension and installation

The controller is installed by panel installation, and the thickness of the front wall of the cabinet should not exceed 4 mm. The opening size on the cabinet is as follows: (the size unit is mm)



Overall size of the controller, panel: 170mm long, 85mm wide, body: 150mm long, 75mm wide, 100mm deep.

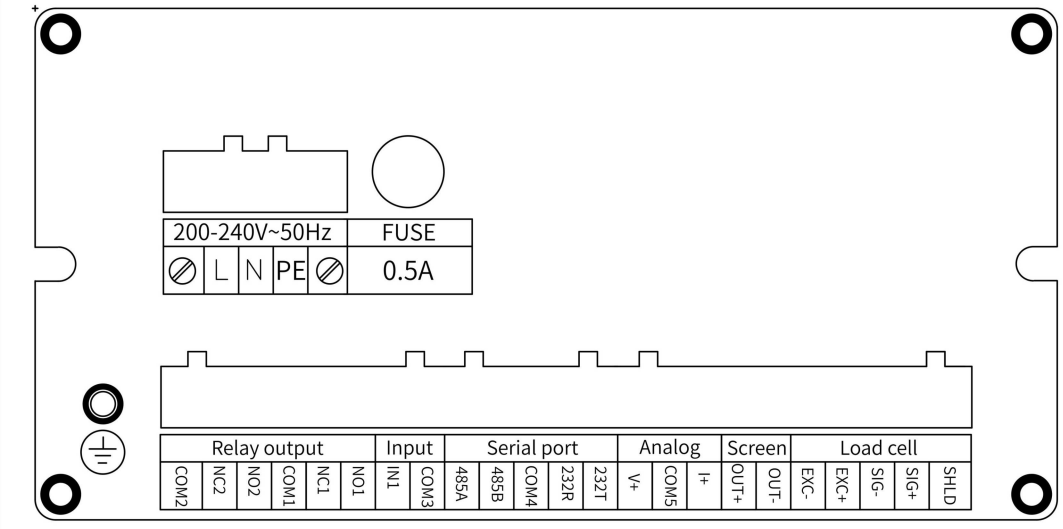
Before installation, please remove the top rods on both sides of the shell, and then load the weighing terminal into the cabinet, and fix the two top rods on both sides of the weighing terminal. Cover the controller shell to ensure firm installation.

2.2 Display instructions

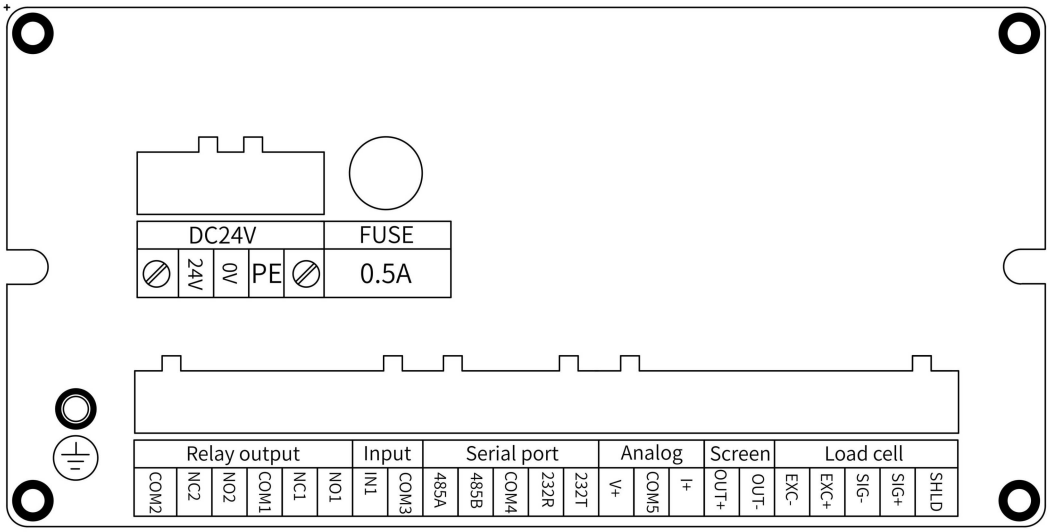
- R 1: Relay 1 action indicator lamp. R2: Relay 2 action indicator lamp.
- R3: material discharging action indicator light. R4: External control start action indicator light
- Tare: Peel the indicator lamp. Zero: Zero point indicator light.
- Motion: Dynamic indicator light, bright when the weight data is unstable.

2.3 Wiring instructions of the rear panel

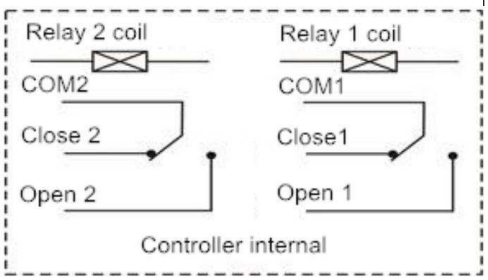
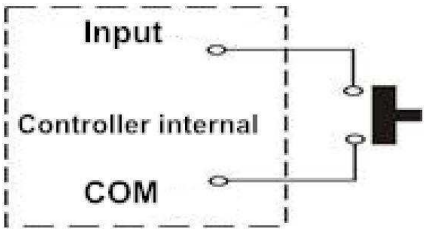
AC220V The rear panel of the power supply instrument is as follows:



The rear panel of the DC24V power supply instrument is as follows:



Description of power supply: AC220V power supply instrument, the upper row wiring seat is 200-240V~50Hz power input, where L, N, PE is fire wire, zero line and earth line. DC24V power supply instrument, the upper wiring seat is DC24V DC power supply input end, 24V is the positive end of input power supply, 0V is the negative end of input power supply, PE is connected to the earth end. Signal input and output wiring instructions are shown in the following table:

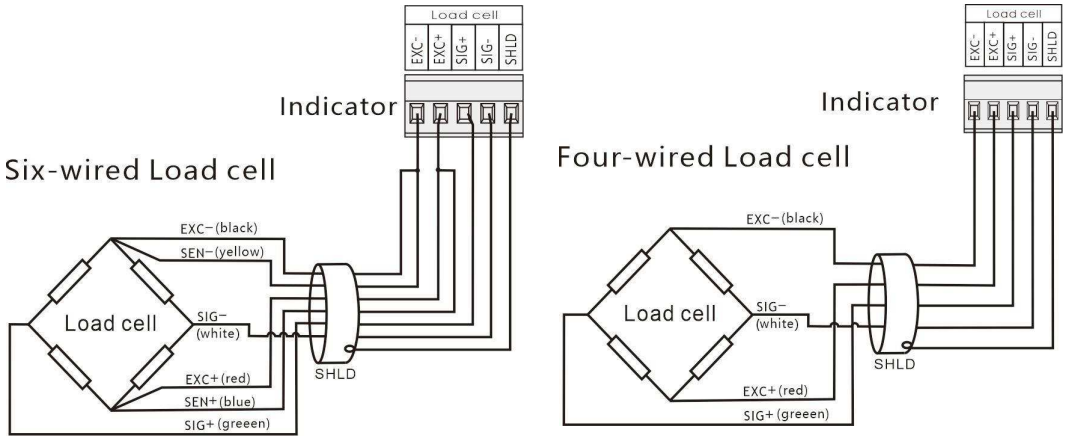
The top row label	**Lower row label**	**explain**	**remarks**
electric relay	COM2	Male 2: Relay 2 public end	The controller provides default relay normally open and normally closed contacts 
	NC2	Closed 2: Relay 2 normally closed contact	
	NO2	On 2: Relay 2 normally open contact	
	COM1	Male 1: Relay 1 public end	
	NC1	Closed 1: Relay 1 is normally closed contact	
	NO1	Open 1: Relay 1 will normally open the contact point	
switch	IN1	Switch signal input	One switch signal input (without self-locking button type switch), passive input mode 
	COM3	Internal DC12V output negative end	
serial port	485A	RS485-A	The controller has two communication modes: RS232 and
	485B	RS485-B	

	COM4	Reference site for RS232 / RS485	RS485, but it cannot be output at the same time. The communication modes selected by internal jumper are RS232 or RS485 with the same data format. If no special required factory default internal jumper select RS485 communication mode.
	232R	Upper position computer RS232 transmitter (controller receiving)	
	232T	Connect to the receiving end of upper computer RS232 (sent by controller)	
analog quantity	V+	The voltage outputs the positive end	The controller can select voltage or current output, output type is selected by parameter F4, select voltage output, V + and I + must be short connected!!!
	COM5	Current output low side end or voltage output negative end	
	I+	Current output at the high side end	
large screen	OUT+	Positive end of large screen current ring output	Connect to Keli or Yaohua large screen current ring output
	OUT-	Large screen current ring output negative end	
pass feel implem ent	EXC-	Sensor negative excitation	**pour:▲! The connection between the sensor and the controller must be reliable, and the shielding wire and the metal housing of the sensor must be reliably grounded. The connecting line does not allow the controller to plug and pull in the power state to prevent electrostatic damage to the controller or sensor.** **! Sensor and controller are electrostatic sensitive equipment, anti-static measures must be taken in use, strictly prohibit welding operation or other strong electric operation on the scale table.**
	EXC+	Sensors are motivated	
	SIG-	Sensor signal input is negative	
	SIG+	Sensor signal input is positive	
	SHLD	Sensor shielding line	

2.4 Wiring method of sensor and controller

Correspondence between Load Cell Output Wires and Controller Terminals				
Instrument	EXC-	EXC+	SIG-	SIG+
Four-wired Load cell	Negative excitation (black)	Positive excitation (red)	Negative signal (white)	Positive signal (green)
Six-wired Load cell	short-circuit connect EXC- and SEN-	short-circuit connect EXC+ and SEN+	Negative signal	Positive signal

Load cell and controller wiring diagram is as follows:



2.5 Description of the key points of installation and debugging

1. The support point of the sensor installation must have enough strength, and the support strength is not enough, which will lead to unstable weight data, poor linear, poor repeatability (different weighing data of the same weight), so the strength of the support point must be paid attention to.

2. We must ensure that the sensor has space for deformation and automatic reset of the scale. During the weighing process of the sensor or shaking, the scale is not allowed to jam or die. Otherwise, it will lead to the sensor signal does not change or the signal is small or linear, poor repetition and other problems.

3. Using multiple sensors should be equipped with the corresponding junction box. The sealing performance of the junction box (poor sealing will lead to the poor insulation performance of the circuit board) and the temperature drift performance directly affect the accuracy of weighing, so the qualified junction box should be selected. After summarizing the junction box signals, connect to the controller through a bus and connect according to the wiring identification of the junction box and the wiring identification of the controller.

4. When the weight of the controller does not change in the loaded load, find the cause of the fault by checking the internal code (3.12 chapter function). If the internal code can change normally, it is a calibration problem, and calibration can be done again. If the code does not change, unplug the sensor socket, with the finger constantly contact the metal pin of the sensor, if the code can change, is damaged or broken junction box or signal line broken (or wrong line) or bad wiring (including junction box wiring) problem, if the code does not change is the controller problem.

5. Under the premise of stable scale table, the weight of the controller is unstable or random jump, and the cause of the fault is also found through the method of checking the internal code of

the controller. If the internal code is also unstable, the general sensor or signal line is broken line or poor wiring problems (replace the sensor or rewiring), if the internal code is stable is generally a problem of calibration (re-calibration).

6. No electric welding operation or other strong electric operation on the scale table.

7. In the case of material in the tank, the misoperation causes the controller to show zero. The weighing data can be restored by setting the parameter F2.7=0, and the weighing data can also be restored by inputting the weight of F8.3 function.

8. After the self-check of the controller, the internal code will be automatically displayed for 2 seconds for the user to check. Through the internal code value, it can be judged whether the sensor is overloaded or the sensor output signal is correct (if further diagnosis, enter the function detection in Section 3.12)

9. The newly installed scale must be calibration (F1 function) before the controller can accurately display the weight data.

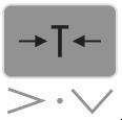
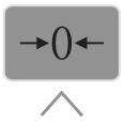
10. The controller prompt is as follows:

prompt message	Information description
Err 01	Data conversion error
Err 06	wrong password
Err17	The sensor signal changes greatly
Err18	The sensor signal is reversed
Err19	EEPROM Read and write error
Err20	The sensor signal does not change when loading the calibration
Err 21	The weight weight input during calibration is too small
AdcErr	The ADC chip failure
OUER	Weight overload

3 Operating instructions

3.1 Key description

key	Keynote name	Function 1	Function 2	Function 3
	[Set key]	Set the relay parameters directly for the weighing state	Return to the previous level menu setting in the setting state	Press the weighing state and other keys to enter a function setting state.

	Relay parameter shortcut key / [Right move key] / [Reduction key]	Relay parameter shortcut keys	F6 function is reduced in parameter settings	Set the setting state
	[Zero key] / [Add key]	The zero clearance function is realized under the weighing state	Change the parameter or number in the setting state	not have
	[Determine key]	Subfunction that entering the current function in the setting state	Save the function parameters of the current set state and go to the next function item	Set the state to perform the current function and proceed to the next function item
	[eject key]	Quit the current function item the setting state	Exit query parameters	

3.2 Description of the function items

The function item types are divided into the first level function item and the second level function item. The second level function item is a sub-function item of the first level function item. Press the first level function item [determining key] to enter the second level function item. When selecting the last function item of the second level function item, press the [setting key] or [determining key] to enter the next level function item. For the convenience of description, a general table of function items is listed for reference.

order number	Primary functional item symbol (name)	order number	Secondary function item symbol (name)
1.	F1 (weight calibration)	**1)**	F1.1 X (Calibration Mode Selection)
		2)	D XXX (Scale value setting)
		3)	CXXXXXX (Range setting)
		4)	F1.2 (zero-point calibration)
		5)	F1.3 (Load and calibration)
		6)	0000000 (loaded weight input)
2.	F2 (working parameter setting)	**1)**	F2.0X (ADC conversion rate setting)
		2)	F2.1X (Filter intensity setting)
		3)	F2.2X (Zero point tracking degree and tracking time setting)
		4)	F2.3XY (Zero point tracking stability condition setting)
		5)	F2.4X (Zero tracking zero setting)
		6)	F 2.5 XY (creep compensation score degree and time setting)

		7)	F2.6X (Button set zero setting)
		8)	F2.7X (Power on the zero setting
		9)	F2.8XY (Low-frequency filter settings)
		10)	F2.9X (Sensor troubleshooting settings)
3.	F3 (communication parameter setting)	**1)**	F3.0X (Serial port 1-wave rate setting)
		2)	F3.1X (Serial port 1 communication mode setting)
		3)	F3.2XXX (Serial port 1 mailing address setting)
		4)	F3.3X (Serial port 2 communication mode setting)
4.	F4 (analog output settings)	**1)**	F4.0X (Analog output enabling settings)
		2)	F4.1X (Analog volume output type setting)
		3)	F4.2X (Weight range setting corresponding to the analog output)
		4)	LXXXXXX (Weight value setting corresponding to the bottom of analog output)
		5)	HXXXXXX (Weight value setting corresponding to the top of the analog output)
5.	F5 (Relay output)	**1)**	F5.0X (Relay output mode setting)
		2)	F5.1X (sorted output mode setting)
		3)	F5.2X (Start the auto zero setting)
		4)	F5.3X (Quick mode setting)
		5)	F5.4X (Setting mode setting)
		6)	F5.5X (accumulated information setting)
		7)	AXXXXXX (Relay parameter A setting)
		8)	bXXXXXX (Relay parameter B setting)
		9)	CXXXXXX (Relay parameter C setting)
		10)	dXXXXXX (Relay parameter D setting)
		11)	EXXXXXX (Relay parameter E setting)
		12)	FXXXXXX (Relay parameter F setting)
		13)	UXXXXXX (Relay parameter U setting)
		14)	C1X. X (startup delay or peak hold time parameter setting)
		15)	C2X. X (stable delay or point moving intermittent time parameter setting)
		16)	C3X. X (no-comparison time setting)
		17)	C4X. X (feeding delay time setting)
		18)	C5X. X (Time setting at click time)
		19)	C6X. X (Cycle start delay time setting)
		20)	C7X. X (Cyounding number times)
6.	F6 (adjust the bottom and top of the analog output)	**1)**	AL-CAL 1 (rough adjustment of analog output base)
		2)	AL-CAL 2 (fine adjustment of analog output base)
		3)	AL-CAL 3 (analog output bottom microadjustment)
		4)	AH-CAL 1 (analog output top rough adjustment)
		5)	AH-CAL 2 (analog output tip fine)
		6)	AH-CAL 3 (analog output tip microadjustment)

7.	**F8.0X (Other parameter settings, password 13222)**	**1)**	F8.0X (Within 2d weight change, stable display enabling setting)) The X sets the range of 0-1 =0: Prohibit stable display =1: Enable stable display
		2)	F8.1 X (Dynamic detection setting, X can setting value is 0~7) 0= prohibited from dynamic detection 1~7, the smaller the number, the more sensitive, the higher the stability requirements The factory default value is 2. Set-up method is the same as step 2
		3)	F8.2X (Controller immediate send setting) The X sets the range of 0-1 =0: Delayed transmission under MODBUS-RTU communication =1: immediate transmission under MODBUS-RTU communication
		4)	DXX.YY. ZZ (factory date setting) D: indicates the date XX: It is the factory year YY: It is the factory month ZZ: It is the factory date D21.02.25: The factory date is 25 / 21
8.	Zero weight adjustment **(FN + ENTER entry code 14333, not suitable for sensitivity calibration mode)**		F8.3X X set the range 0-1 =0: Zero low =1: zero adjustment LXXXXXX:, Zero point adjustment and low weight setting HXXXXXX:, Zero point adjustment weight setting

3.3 Weight calibration F1

Prepare the appropriate weight or weight before calibration. The weight calibration needs to enter the correct password (12111). The correct password does not need to be entered again within 5 minutes after the input once. If the parameters are set again after 5 minutes, you need to enter the password again.

step	show	Function Name (Symbol)	explain
1.	【F1 】	Weight calibration (F1)	Press [Set key] and [Zero key] to enter F1. Press [OK] to enter the calibration password input interface.
2.	【P-00000 】	Calibration Password Entry (PASSWORD)	**The correct calibration password is 12111** Press [right to move the key] to select the modification bit; Press [Add key] to modify the size of the blinking bit value;

			Press [OK] to take the next step if the password is correct Press the [Exit key] to return to the weighing status, Press [Function] to cancel the current operation to the next step PrompERR 06 if the password is incorrect.
3.	【F1.1 X】	The calibration method is selected	Where X is the calibration mode set **X=0: Loading and calibration of the weight (X=0 is a conventional calibration method, which can be completed in setting step 4-8).** X=1: modify the input and proceed directly to step 9 after step 5 X=2: Sensitivity input calibration, after step 5 directly proceed to step 12 Refrefer to step 2
4.	【D XXXX】	Scale value setting (DXXXX)	Where XXXX is the dividing value, the dividing values that can be set are: 1,0.1,0.01,0.001,2,0.2,0.02,0.002,5,0.5,0.05,0.005, 10,20 and 50. Press [Increase key] to select the desired score value; Press [OK] to save the set score value and proceed to the next step.
5.	【CXXXXXX】	Set the scale range or total sensor range (CXXXXXX)	**Where XXXXXX is the scale range (calibration method 0 and 1) or the total range of the sensor (calibration method 2), if the scale range is 10000, enter 0010000. Set up to complete automatically go to the next step.** Refrefer to step 2
6.	【F1.2 】	Zero-point calibration (F1.2)	**It means that zero will be determined, requiring to be an empty scale and keep the scale table stable.** - - - - - - - Press [OK key] to start zero calibration, the controller displays "" and the column gradually extinguished, during the data is unstable, the column will return to full light state. After all the light columns are extinguished (if the field data is unstable, the light column cannot be extinguished, and the F8.1 parameter is adjusted, and the stability detection is not conducted at F8.1=00), the calibration zero is completed, and the next step is automatically entered.
7.	【F1.3 】	Weight scaling range (F1.3)	Said to calibrate range, first require scale loading weight or weight, suggest the loading weight is greater than 20% of the maximum weighing, weight,

			weight or uniform distribution or placed in the center of the scale and stable, press the [key] start scale calibration, the controller display "" at the same time gradually out, during the data is not stable, the light column will restore full bright state. After all the light columns are extinguished (if the field data is unstable, the light column cannot be extinguished, and the F8.1 parameter is adjusted, and the stability detection is not conducted at F8.1=00), the controller automatically enters the next step.▪ ▪ ▪ ▪ ▪ ▪
8.	First [0000000] After [0010000]	Enter the weight Calibration weight value（0000000）	The controller displays "0000000" to enter the actual weight value of the loaded weight or weight. If the weight is 10000, enter 0010000, and press [OK]. If the calibration accurate controller immediately displays the input weight. After this weight calibration is completed, the normal weight control can be completed. Refer to step 2 for key operation. Note that the scale table must be kept stable in steps 5~7 before operation
Step 9~11 Change calibration parameters (back up the original parameters for recovery) **See 4.6 Example of calibration parameter modification!!!**			
9.	【F1.2 】 【H001000】 【H002000】	Zero-point internal code input (F1.2) **Note: 2 mV / V sensor full range code around 542000**	It means that the zero-point calibration internal code will be entered. H is positive, and-is negative After pressing [OK], the controller displays the current zero internal code value, such as "H001000", indicating that the current internal code is "1000". At this time, the user can modify the zero internal code value according to the actual needs, if changed to "2000", then enter "H002000". Press key operation to step 2 and press [OK] to the next step.
10.	【F1.3 】 【H020000】 【H030000】	In-range code input (F1.3) **Note: 2 mV / V sensor full range code around 542000**	It means that the scale and calibration internal code will be entered. H is positive, and-is negative After pressing [OK], the controller displays the current range code value, such as "H020000", indicating that the current code code is "20000". At this time, the user can modify the zero internal code value according to the actual needs, if changed to "30000", then enter "H030000". Press key operation to step 2 and press [OK] to the next step.
11.	【F1.4 】	Calibration Weight Input (F1.4)	Indicates that the range scale weight will be entered. H is positive, and-is negative After pressing [OK], the controller displays the

	【H003000】 【H001500】		current calibration weight value, such as "H003000", indicating that the current calibration weight is "3000". At this time, the user can modify the weight weight according to the actual needs, if changed to "1500", then enter "H001500". Press the key operation reference step 2, press [OK key] and end the parameter input calibration.
Step 12 to 13 is the sensitivity calibration (this function must be noted before ordering) **See 4.7 Sensitivity calibration for example!!!**			
12.	【 LX.XXXXX 】 【L2.00000】 【L3.00000】	Sensitivity input（LX.XXXXX）	“LX. XXXXX "represents the current sensitivity value, the user can modify the sensitivity value according to the actual needs, if the current sensitivity is" 2.0 ", namely L2.00000, now changed to 3.0, then input L3.0000, and then press [OK]. Generally, after completing this step, press [exit key] to return to the weighing state to complete the sensitivity calibration. If there is a deviation at zero, press [zero] key to set zero. Refrefer to step 2. If to modify the zero inner code of the sensitivity calibration, proceed to step 13
13.	【F1.5 X】 【F1.5 1】 【H001500】 【H002500】	Zero internal code modification enabled (F1.5) **Note: 2 mV / V sensor full range code around 542000**	[F1.5 X] sensitivity calibration =0 No not modify zero; =1 Enmodify zero; =2 zero restore factory zero and update working zero. Press [OK] After setting X=1, you can modify the zero internal code of sensitivity calibration. For example, the original internal code is "1500", now modified to "2500", enter "0002500", and then press [OK].

3.4 Operating parameter setting: F2

Users can modify the controller working parameters according to need, these parameters include: ADC conversion rate, filtering mode, button zero, automatic zero tracking range, dynamic detection parameters, continuous filter parameters, boot automatic zero range parameters and intermittent filtering parameters, when setting parameters, if modified parameters do not need to save, press [set key] to enter the next step, if the modified parameters need to be saved, then need to press [OK key] to save and automatically enter the next parameter, press [Exit key] to return to the weighing state. The specific setting steps are shown in the following table.

step	**show**	**Function Name (Symbol)**	**explain**
1.	【F2 】	Working Parameter	Press [Set key] and [Set Zero Key] to enter F1, and then press [Set key] again to display F2.

		Setting (F2)	Press [OK] to enter the next step.
2.	【F2.0 X】	ADC Conversion Rate Settings (F2.0X)	X can set values of 0 to 3. 0＝25Hz；1=50Hz；2=100Hz；3=200Hz。 The factory default value is 2. Press [Add key] to select the desired ADC conversion rate; Press [OK] to save the changes and proceed to the next step. Press the [Settings key] to return to the previous menu (without saving the parameters).
3.	【F2.1 X】	Filter Strength Settings (F2.1X)	The X is set to a value of 0 to 9. The larger the X, the stronger the filtering degree. The factory default value is 4. Set-up method is the same as step 2.
4.	【F2.2 XY】	Zero tracking degree and tracking time setting (F 2.2 XY)	XY range 00-99, XY = 00 means the zero trace is invalid X: zero tracking degree, Y: zero tracking time XY = 11 zero tracking degree 0.5d, tracking time 2 seconds XY = 22 zero tracking degree 1.0d, tracking time 4 seconds XY = 33 zero tracking degree 1.5d, tracking time 6 seconds XY = 44 zero tracking degree 2.0d, tracking time 8 seconds XY = 99 zero tracking degree of 4.5d, tracking time of 18 seconds The factory default value is 34. Set-up method is the same as step 2.
5.	【F2.3 X】	Zero-point tracking stability condition setting (F2.3X)	X can set values of 0 to 7. 0=0.25d；1=0.5d；2=1d；3=1.5d；4=2d 5=3d；6=4d；7=5d； The factory default value is 2, set the same method as step 2.
6.	【F2.4 X】	Zero-point tracking return-to-zero setting (F2.4X)	X =0 trace zero no enable X =1 trace zero enabled The factory default value is 1.
7.	【F2.5 XY】	Creep compensation score degree and time setting	XY range 00-99, XY = 00 means that the creep compensation is invalid X: creep compensation degree, Y: creep compensation time XY = 11 creep compensation degree of 0.5d,

		（F2.5 XY）	compensation time of 2 seconds XY = 22 creep compensation degree of 1.0d, compensation time of 4 seconds XY = 33 creep compensation score degree of 1.5d, compensation time of 6 seconds XY = 44 creep compensation degree of 2.0d, compensation time of 8 seconds XY = 99 creep compensation score of 4.5d, compensation time of 18 seconds The default value is 00. Set-up method is the same as step 2.
8.	【F2.6 X】	Button reset parameter setting (F2.6X)	X can a a value of 0-7. 0= prohibited; 1= set zero range ± 1%FS; 2= zero range ± 2%FS; 3= zero range ± 5%FS; 4= zero range ± 10%FS; 5= zero range ± 20%FS; 6= zero range ± 50%FS; 7= unlimited zero range; The factory default value is 3. Set-up method is the same as step 2.
9.	【F2.7 X】	Power-on automatic zero range parameter setting (F2.7X)	X can be set for 0,1,2,3,4. 0= prohibited, the boot zero is the calibration zero 1= startup automatic zero range ± 4%FS 2= automatic zero range ± 10%FS 3= automatic zero range ± 20%FS 4= Power-on zero remains unchanged, that is, the last set zero The factory default value is 4. Set-up method is the same as step 2.
10.	【 F2.8 X Y 】	Low frequency filtering settings	X is the display fluctuation range setting of the scale table, and Y is the filter intensity Low-frequency filtering is only started when the scale stage is relatively stable. The larger the X value, the greater the internal code fluctuation allowed by the low frequency filtering. 0=50；1=100；2=200；3=400；4=1000； 5=5000；6=10000； The higher the Y value, the higher the low-frequency filtering intensity. 0: Do not start the low frequency filtering 1:16 times 2:32 times 3:64 times 4:128 times Factory default value is 33, set the method as step 2.

3.5 Communication parameter set F3

Communication parameters that can be set include serial port 1 wave rate, communication mode, communication address, and serial port 2 communication mode. The port rate can be set to 1200bps, 2400bps, 4800bps, 9600bps and 19200bps. When the controller address can be set, serial port 1 and serial port 2 can choose various communication modes. The specific setting steps are shown in the following table.

step	show	Function Name (Symbol)	explain
1.	【F3 】	Communication parameter setting (F3)	F3 sets the function for the communication parameters, including the sub-function items. Press [Set key] and [Zero key] to enter F1, and then press [Set key] to select to display F3. Press [OK] to enter the next step.
2.	【F3.0 X】	Serial port rate setting (F3.0X)	X can be set for 0,1,2,3,4.**(Effective immediately after parameter modification)** 0＝1200bps；1=2400bps；2=4800bps； 3=9600bps；4=19200bps； The factory default value is 4. Press [Add key] to select the desired port rate; Press [OK] to save the changes and proceed to the next step. Press [Set key] to return to the previous menu (no save parameters);
3.	【F3.1 X】	Serial port communication mode setting (F3.1X)	X can be set for 0,1,2 and 3. 0=MODBUS-RTU; 1 = 1 for the continuous output of the ASCII code 2= yaohua or Coli large screen output, 3 = ASCII code continuous output 2; The factory default value is 0. Set-up method is the same as step 2.
4.	【F3.2XXX】	Serial port Communication address settings（F3.2XXX）	XXX represents the native address when multi-machine communication in command mode, and the value that can be set is 0~255. The factory default value is 1. Other setting methods are the same as step 2
5.	【F3.3 X】	Large-screen Output Mode Setting (F3.3X)	X can set the values of 0,1. 0= no output; 1= Yaohua or Keli large screen output The factory default value is 0. Set-up method is the same as step 2.

3.6 Analog output setting F4

When the controller has an analog output module, it can set the analog output type and select the weight transmission range of the analog output through the F4 function item. The simulated output types are 0 ~ 20 mA, 4 ~ 20 mA, 0~5V and 0~10V. The weight transmission range of the analog output can be zero to maximum weighing or the selected weight range. When setting parameters, if the modified parameters do not need to be saved, press [Set key] to go to the next step. If the modified parameters need to be saved, you need to press [OK] to save and automatically enter the next parameter, and press [Exit] to return to the weighing state. The specific setting steps are shown in the following table.

step	show	Function Name (Symbol)	explain
1.	【F4 】	Analog output settings (F4)	Press [Set key] and [Set Zero key] to enter F1, and then press [Set key] to select the cycle to display F4. Press [OK] to enter the next step.
2.	【F4.0 X】	Analog output-enable settings (F4.0X)	X can set the values of 0,1. 0= prohibited analog output; 1= enable analog output The factory default value is 0. Press [Add key] to select the desired analog output type; Press [OK] to save the changes and proceed to the next step. Press the [Settings key] to return to the previous menu (without saving the parameters).
3.	【F4.1 X】	Analog Output Type Setting (F4.1X)	X can be set for 0,1,2 and 3. Current output: 0 = 0 ~ 20 mA; 1 = 4 ~ 20 mA; Voltage output: 2=0~5V; 3=0~10V The factory default value is 1. ***(Note that analog interface terminals V + and I + must be short when selecting voltage output)***
4.	【F4.2 X】	Specific weight range setting for the analog output pair (F4.2X)	X can set the values of 0,1. 0 indicates that the weight range corresponding to the simulated amount is 0 to the maximum weight, when the weight is 0, the bottom value of the analog output, and the maximum weight corresponds to the top value of the simulated output; 1 shows that the weight range corresponding to the simulated amount is the set weight range, the low end value of the weight range corresponds to the bottom value of the simulated output, and the high end value corresponds to the top value of the simulated output.

			The factory default value is 0. Press [Add key] to set the weight range corresponding to the simulated quantity; F4.2=0 To F5; if F4.2=1, to the next step.
5.	【LXXXXXX】	Weight value setting corresponding to the bottom of analog output (LXXXXX)	Set the weight value corresponding to the bottom end of the analog output. **Note: The bottom weight can be set negative value, setting range: -99999 ~ 999999** Press [right to move the key] to select the modification bit; Press [Add key] to modify the size of the blinking bit value; Press [Set key] to save the next step; Press [OK] to save the changes and proceed to the next step.
6.	【H XXXXXX】	Weight value setting corresponding to the top of the analog output (HXXXXXX)	Set the weight value corresponding to the top of the analog output. **Setting range: 0~999999, the setting method is the same as step 5.**

3.7 Adjust the bottom end of the analog output to the top end of F6

Before leaving the factory, all four kinds of analog outputs are calibrated. When put to use, just choose the type of analog output. If necessary, the bottom and top values of the current selection of analog output can be adjusted in the F6 function. For example, the current selection of analog output type is 0-5V, which can be adjusted to 0.5-4.5V using the F6 function. When adjusting, the analog output terminal connects to the high-precision voltage or ammeter, follow the following table setting steps, and exit the setting when the requirements are met. The specific setting steps are shown in the following table.

step	**show**	**Function Name (Symbol)**	**explain**
1.	【F6 】	Adjust the bottom and top of the analog output (F6)	Press [Set] and [Right] to enter F6. Press [OK] to enter the next step. If press [Set key], enter ESC;
2.	【P-00000 】	Password input (PASSWORD)	**The correct password is 13,222** Press [right to move the key] to select the modification bit; Press [Add key] to modify the size of the blinking bit value;

			Press [OK] to the next step if the password is correct and ERR 06 if the password is incorrect.
3.	【AL-CAL1】	Analog output bottom rough adjustment (AL-CAL 1)	The bottom end of the analog output is roughly adjusted to connect a voltmeter or ammeter with high precision at the corresponding analog output end according to the current analog output type. The values are displayed on the watch table and then adjusted for the following methods: Press [Increase key] to simulate the increase of the output base value; Press [Reduce key] to simulate the output base value; Once the adjustment meets the requirements, press [OK] to save the adjustment value, and the controller automatically enters the next step.
4.	【AL-CAL2】	Fine adjustment (AL-CAL 2)	The bottom end of the analog output is slightly adjusted. Adjustment method is the same as step 3.
5.	【AL-CAL3】	Analog output bottom microadjustment (AL-CAL 3)	Minor adjustments were made at the bottom of the analog output. Adjustment method is the same as step 3.
6.	【AH-CAL1】	Analog output top rough adjustment (AH-CAL 1)	The top of the analog output is roughly adjusted. Adjustment method is the same as step 3.
7.	【AH-CAL2】	Simulation output tip fine (AH-CAL 2)	Small adjustments made at the tip of the analog output. Adjustment method is the same as step 3.
8.	【AH-CAL3】	Analog output tip microadjustment (AH-CAL 3)	Minor adjustments were made to the simulated output tips. Adjustment method is the same as step 3. Press [OK] to return to the weighing status.

3.8 Relay output and switch quantity input settings F5

Table 1: input / output control mode

Method (F5.0)	function	Relay 1	Relay 2	Input switch function
=0	output disable	close	close	External control set zero
=1	Real-time value output	Fixed value 1	Fixed value 2	External control set zero
=2	Real-time sorting output	Lower limit	Upper limit	External control set

		or qualified	or qualified	zero
=3	External control value output	Fixed value 1	Fixed value 2	Start and exit
=4	External control sorting output	Lower limit or qualified	Upper limit or qualified	Start and exit
=5	Bring back the zero control fixed value output	Fixed value 1	Fixed value 2	External control set zero
=6	External control quantitative feeding	Fast plus	Slow and	Start and exit
=7	External control and quantitative material reduction of 1	Drain	Overload alarm	Start and exit
=8	External control for quantitative material reduction of 2 or material level maintenance	Drain	feed supplement	Start and exit
=9	External control 2 ingredients	Material 1	Material 2	Start and exit
=10	External control 1 ingredient belt with feeding	Material 1	blowing	Start and exit and feed
=11	External control moment peak	Lower limit or qualified	Upper limit or qualified	Start and exit

Table 2: sorted output comments

Sorting parameters (F5.1)	Relay mode	Relay 1	Relay 2
=0	Sorting output	lower limit	superior limit
=1	Sorting output	lower limit	qualified
=2	Sorting output	qualified	superior limit

Note 1: See: 4.8

Note 2: Press [Set key] to set the relay related parameters in a shortcut way.

The specific setting steps of all parameters are shown in the following table:

step	**show**	**Function Name (Symbol)**	**explain**
1.	【F5 】	Relay Output Setting (F5)	Press [Set key] and [Set Zero key] to enter F1, and then press [Set key] to select the cycle to display F5, Press [OK] to enter the next step.
2.	【F5.0 X】	Relay Output Mode Setting (F5.0X)	X can able values of 0 to 11, see Table 1 above. If the user does not use the relay output function, it is recommended to set the relay output mode to 0.

			The factory default value is 1. Press [Add key] to select the required relay output mode; Press [OK] to save the changes and proceed to the next step. Press the [Settings key] to return to the previous menu (without saving the parameters).
3.	【F5.1 X】	Sorting Output Mode Setting (F5.1X)	X can set values of 0 to 2. See Table 2 above for the functions The factory value is 0. Set-up method is the same as step 2.
4.	【F5.2 X】	Whether to set the zero setting before starting the feeding （F5.2X）	X can set the values of 0,1, and 2. Set-up method is the same as step 2. Before X=0 feeding, the skin weight is automatically calculated and peeled. X=1 to zero before feeding. X=2 before adding, zero and peel. The factory value is 1.
5.	【F5.3 X】	Fast Plus Output Settings (F5.3X)	X can set values of 0 to 1. =0: When fast feeding, fast adding and slow adding relay output at the same time; =1: When fast feeding, fast adding output, slow adding relay does not output. The factory value is 0. Set-up method is the same as step 2.
6.	【F5.4 X】	Feed mode setting (F5.4X)	X can set values of 0 to 1. =0: The feeding method is automatic feeding. =1: The feeding method is manual feeding. The factory value is 1. Set-up method is the same as step 2.
7.	【F5.5 X】	Cumulative deletion enable (F5.5X)	X can set values of 0 to 1. =0 Do not delete cumulative information; =1 delete cumulative information The factory value is 0. Set-up method is the same as step 2.
8.	【AXXXXXX】	Relay parameter A setting （AXXXXXX）	**Set the relay parameter A. Press [Set key] to set the relay related parameters in A shortcut way.** Press [right to move the key] to select the modification bit; Press [Add key] to modify the size of the blinking bit value; Press [Set key] to save the next step; Press [OK] to save the changes and proceed to the next step.

9.	【bXXXXXX】	Relay parameter b is set （bXXXXXX）	Set the relay parameter b. The setting method is the same as in step 10. **Press [Set key] to set the relay related parameters in a shortcut**
10.	【CXXXXXX】	Relay parameter C setting （CXXXXXX）	Set the relay parameter C. The setting method is the same as in step 10. **Press [Set key] to set the relay related parameters in a shortcut**
11.	【dXXXXXX】	Relay parameter d is set （dXXXXXX）	Set the relay parameter, d. The setting method is the same as in step 10. **Press [Set key] to set the relay related parameters in a shortcut**
12.	【EXXXXXX】	Zero-zone weight value setting （EXXXXXX）	Set the zero zone weight value. When the scale weight value is less than this value, the weight has been returned to zero. The setting method is the same as in step 10.
13.	【FXXXXXX】	Relay parameter F setting （FXXXXXX）	Set the relay tolerance value of 1. The setting method is the same as in step 10.
14.	【UXXXXXX】	Relay parameter U setting （UXXXXXX）	Set the relay tolerance value of 2. The setting method is the same as in step 10.
15.	【C1 X.X】	Set the time-delay parameter 1 （C1 X.X）	Set the start delay or peak hold time, the value range is from 0.0 to 9.9 seconds; The setting method is the same as in step 10.
16.	【C2 X.X】	Set the time-delay parameter 2 （C2 X.X）	Set the stability time or point movement interval time, the value ranges from 0.0 to 9.9 seconds; The setting method is the same as in step 10.
17.	【C3 X.X】	Set the time-delay parameter 3 （C3 X.X）	Set the forbidden comparison time, the value ranges from 0.0 to 9.9 seconds; The setting method is the same as in step 10.
18.	【C4 X.X】	Set the time-delay parameter 4 （C4 X.X）	Set the feeding delay time, the value range is from 0.0 to 9.9 seconds; The setting method is the same as in step 10.
19.	【C5 X.X】	The time-delay parameter 5 is set （C5 X.X）	Set the point dynamic feeding time, the value ranges from 0.0 to 9.9 seconds; The setting method is the same as in step 10.
20.	【C6 XX】	Set the time-delay parameter 6 （C6 X.X）	Set the cycle ingredient delay, the value range is 00~99 seconds; The setting method is the same as in step 10.
21.	【C7 XX】	Cycle number setting （C7 XX）	Set the number of ingredient cycles, the value range is 00~99, if set to 99, infinite cycle; The setting method is the same as in step 10.

3.9 Accumulated number of ingredients query and deletion

step	show	Function Name (Symbol)	explain
1.	【P-00000 】	Password input (PASSWORD)	Press [OK] and [Exit] to enter the password input interface. **The correct password is 12,111.** Press [right to move the key] to select the modification bit; Press [Add key] to modify the size of the blinking bit value; Press [OK] to enter the next step if the password is correct; Press [Exit key] to return to the weighing status. PrompERR 06 if the password is incorrect.
2.	【 CXXXXXX 】	Display ated ated times (CXXXXXX)	Where XXXXXX is the cumulative number, and if the cumulative number is 10, C000010 is shown. Press [OK] to enter the next step. **Refrefer to step 1.**
3.	【F5.5 X】	Cumulative number of deletions is enabled （F5.5X）	Where X is the cumulative information enabling position =0 Do not delete the cumulative information; =1 Delete the cumulative information; To delete the cumulative information, enter "1" and press [confirm key].

3.10 Controller parameter initialization operation

step	show	Function Name (Symbol)	explain
1.	【P-00000 】	Password input (PASSWORD)	**When the controller is powered, press [OK] and [Exit] to enter the password input interface.** **Note: Initial working parameter password is 22222 and initial calibration parameter password is 33333** Press [right to move the key] to select the modification bit; Press [Add key] to modify the size of the blinking bit value; Press [Exit key] to return to the weighing status; PrompERR 06 if the password is incorrect. After entering the correct password, press [OK] to complete the initialization operation. Note: The parameter initialization must be performed when the controller is powered up to the self-test.

3.11 The controller displays the weight correction function operation

When the scale table shows that the weight is different from the actual value, and the

field situation is not convenient to determine the weight calibration, the weight correction method can be used to solve the weight deviation problem.

step	show	Function Name (Symbol)	explain
1.	【P-00000 】	Password input (PASSWORD)	Also press [Set key] and [OK] to enter the password input interface. Enter the password 13222 and press [OK] to the next step.
2.	【0000000】	Enter the corrected weight value	Enter the scale table material correction weight (which is the actual weight value of the material) directly. If the controller currently shows the weight of 1900, the actual weight of the scale material is 2000, input the correction weight of 2000, press [OK], and the weight of the controller shows 2000. Note: to cancel the correction, input the correction weight directly to 0.

3.12 Sensor internal code view function operation

When the controller shows the weight of the unstable value (or shows 0 does not change, or shows overload abnormal value), then check whether the sensor code is stable, to eliminate the sensor fault factor.

step	show	Function Name (Symbol)	explain
1.	【P-00000 】	Password input (PASSWORD)	Also press [Set key] and [OK] to enter the password input interface. Enter the password 00000 and press [OK] to the next step.
2.	【xxxxxx】	Displays the internal sensor code value	At this time, the output 1,2,3,4 four indicators are on, and the sensor code value range of the sensor is about 542,000. The sensor can be detected by checking whether the sensor code code is stable and linear changes. Press [Set key] or [OK] or [Exit] to return to the weighing status.

3.13 Controller software version number and factory date view function operation

step	show	Function Name (Symbol)	explain
1.	【 E23.81 】	Software version number display interface	Also press [zero] and [OK] to enter the software version number to view the interface, such as "E23.81" version number is 23.81, and then press [OK] to enter the factory date interface.
2.	【 D23.02. 25】	Displays the controller's factory date	Year of the date of factory delivery is on display.moon. Day, such as "D23.02.25", the factory date is February 25,23, press [OK key] to return.

4 Appendix

4.1 Command mode

Paud rate: 1200 / 2400 / 4800 / 9600 / 19200 (optional) 8 data bits, 1 start bit, 1 stop bit, no check. Note: The actual weight value in the command mode is signed, that is, for example, the gross weight is 1.386 kg (tons, g, kg), which is the display value of the controller, the weight is 1386, namely 0X56A, represented by the signed 16 digits, high byte is 0X05, low byte is 0X6A; represented by the signed long integer number, from high to low bytes are 0X00,0X00,0X05,0X6A.

4.2 Description of the MODBUS compatible communication protocol

Select the Modbus compatible communication mode for the parameter [F 3.2=0], and use the data transmission in RS485 or RS232 mode. MODBUS Mainly slave network communication protocol, the weighing terminal is called by the upper system as a slave station in MODBUS network. The data format is RTU and supports 03,06 and 16 functions. **Hold register 40001, in which the data address is register 0000.** The functional code area maintains the specified register type, so "4XXXX" is the default address type. For example, the hold register 40001 address address is 0000 hex (+ precession 0) and the hold register 40011 address address is 000 Ahex (10 decimal 10). Up to 22 internal registers can be read at a time using the 03 function.16 The function writes up to 15 consecutive registers each time. Mapping address of the weighing data in the modbus:

Content address	explain	remarks
40001	Controller display weight (signed 16 bits, short integer) -32768~32767	Read-only (function code 03)
40002	Decimal value (0,1,2,3)	Read-only (function code 03)
40003-40004	Controller display weight (signed 32 bits, long)	Read-only (function code 03)
40005-40006	Leather weight (signed length)	Read-only (function code 03)
40007	State output word, specifically defined as follows:	Note: After the feeding relay output mark is changed from 1 to 0, the actual weight mark can be saved from 0 to 1
	Bit 0: Display the weight peeling mark	
	Position 1: display the weight stability mark	
	Position 2: display the weight zero zone mark	
	Position 3: feeding process mark	
	Bit 4: relay 1 output mark	

		Bit 5: relay 2 output mark	
		Position 6: Actual weight output mark	
		Bit 7: Run, and the output flag	
		Bit 8: the calibration enabling sign	
		Position 9: Zero point calibration for marking	
		Bit 10: range calibration and marking	
		Bit 11: The sensor signal is too small after loading the weight	
		Position 12: Small range calibration weight alarm	
40008-40009		Relay parameter A value, the written data is written to the internal EEPROM	Read and write (function code 03,16)
40010-40011		Relay parameter B value, the data written to the internal EEPROM	Read and write (function code 03,16)
40012-40013		Relay parameter C value, the data written to the internal EEPROM	Read and write (function code 03,16)
40014-40015		Relay parameter D value, the data written to the internal EEPROM	Read and write (function code 03,16)
40016		Zero zone weight E value, the data written to the internal EEPROM	Read and write (function code 03,16)
40017		Tolerance F value, the data written to the internal EEPROM	Read and write (function code 03,16)
40018		Tolerance U value, the data written to the internal EEPROM	Read and write (function code 03,16)
40019		Cumulative times	Read-only (function code 03,06,16)
40020-40021		actual weight	Read-only (function code 03)
40022	Position 0	Zero (1 valid, pulse letter)	Write only (function code 06)
	Position 1	Peel (1 valid, pulse letter)	Write only (function code 06)
	Position 2	Unpeeling (1 valid, pulse letter)	Write only (function code 06)
	Position 3	Start-stop control position (1 valid, pulse letter)	Write only (function code 06)
40023		Calibration enables (signed 16 bits), write 0x88 (136) is valid	Write it (function code 06)
40024		Zero point calibration (signed 16 bits), write 0x00 valid	Write it (function code 06)

40025	Scale calibration (signed 16 bits), write the actual calibration weight	Write it (function code 06)

4.3 serial of MODBUS communication protocol

4.3.1 03 Functional examples

1. The weight of the upper computer read controller (signed 16 bits, namely the read save register 40001), and the controller address is set in F3.3

information content	controller address	FC	Register start address to be read (16-bit)		Number of registers read (16-bit)		CRC check code (16-bit)	
			high byte	lower byte	high byte	lower byte	high byte	lower byte
HEX (16 ppx)	01	03	00	00	00	01	84	0A

Controller response: (assuming display weight =1000 (16 decimal means: 0x03E8))

information content	controller address	FC	The controller returns the number of bytes	Return the data of the 40001 register (16-bit)		CRC check code (16-bit)	
				high byte	lower byte	high byte	lower byte
HEX (16 ppx)	01	03	02	03	E8	B8	FA

2. Upper computer read controller display weight (signed length integer, namely read hold register 40003-40004)

information content	controller address	FC	Register start address to be read (16-bit)		Number of registers read (16-bit)		CRC check code (16-bit)	
			high byte	lower byte	high byte	lower byte	high byte	lower byte
HEX (16 ppx)	01	03	00	02	00	02	65	CB

Controller response: (assuming display weight =80000 (16 R: 0x00013880))

information content	controller address	FC	The controller returns the number of bytes	Return of 40003 register data (16-bit)		Return the data for the 40004 register (16-bit)		CRC check code (16-bit)	
				high byte	lower byte	high byte	lower byte	high byte	lower byte
HEX (16 ppx)	01	03	04	00	01	38	80	B9	93

4.3.2 16 Function examples

1. Upper computer write relay parameter A value (i. e. write holding register 40008~40009,

the written number is signed long integer number, such as set C value =70000 (HEX (16 decimal number) indicates: 0X00011170))

Informa-tion	Controller Address	Func-tion Code	Register start address to be written (16 bits)		Number of registers to write (16 bits)		Number of bytes written	Data written to 40008 register (16 bits)		Data written to 40009 register (16 bits)		CRC check code (16 bits)	
			High byte	Low byte	High byte	Low byte		High byte	Low byte	High byte	Low byte	High byte	Low byte
HEX (Hexadeci-mal number)	01	10	00	07	00	02	04	00	01	11	70	EE	3D

Controller Response:

Information	Controller Address	Function Code	Register start address to be written (16 bits)		Number of registers to write (16 bits)		CRC check code (16 bits)	
			High byte	Low byte	High byte	Low byte	High byte	Low byte
HEX (Hexadecimal number)	01	10	00	07	00	02	F0	09

2. The upper computer uses 16 functions, write 11 words from the address unit 40008, write relay parameters A=1000, b=2000, C=3000, D=4000, E=60, F=50, U=20, the upper computer sends 16 decimal code as follows:

01 10 00 07 00 0b 16 00 00 03 e8 00 00 07 d0 00 00 0b b8 00 00 0f a0 00 3c 00 32 00 14 85 cf

4.3.3 06 Functional examples

1. Write reset command (namely, write hold register 40022)

information content	controller address	FC	Register Address to Write (16 bits)		Data written to register 40022 (16 bits)		CRC check code (16-bit)	
			high byte	lower byte	high byte	lower byte	high byte	lower byte
HEX	01	06	00	15	00	01	59	C E

Controller Response:

information content	controller address	FC	Register Address to Write (16 bits)		Data written to register 40022 (16 bits)		CRC check code (16-bit)	
			high byte	lower byte	high byte	lower byte	high byte	lower byte
HEX	01	06	00	15	00	01	59	C E

2. Write peel command (write hold register 40022)

information content	controller address	FC	Register Address to Write (16 bits)		Data written to register 40022 (16 bits)		CRC check code (16-bit)	
			high byte	lower byte	high byte	lower byte	high byte	lower byte
HEX	01	06	00	15	00	02	19	CF

Controller Response:

information content	controller address	FC	Register Address to Write (16 bits)		Data written to register 40022 (16 bits)		CRC check code (16-bit)	
			high byte	lower byte	high byte	lower byte	high byte	lower byte
HEX	01	06	00	15	00	02	19	CF

3. The calibration steps are as follows:

① Send calibration enabling command (write 0x88 in unit 40023 (decimal 136)):

② The sensor sends zero calibration instruction in no-load state (write 0x00 in unit 040024):

③ Scale table loads weights and sends range calibration instruction (calibration weight is 4500, write 0x1194 in unit 40025 with 06 function)

Note: After the calibration is completed, it is recommended to close the calibration enabling device (40023 unit can write 0), or power off to restart the controller.

4.4 Continuous delivery mode

4.4.1 Continuous sending mode 1

Paud rate: 1200 / 2400 / 4800 / 9600 / 19200 (optional)

Each frame of data consists of 10 bits, 8 bits, 1 bit start bit, 1 bit stop bit, no check.

Data appear simultaneously on the RS232 and RS485 bus. Data and the controller display the weight content consistent, each set of data contains 10 frames, the first frame for data starting character frame "=", followed by seven data frames, high invalid 0 with "" (space), if the display value is negative, the data frame highest send "-", such as the instrument shows a decimal point, the weight data contains "."Decimal point character, and finally the 2-frame end character.

start symbol	**Display weight data**							**tailed**	
=	high-order						low-order	0D	0A

For example, the controller displays "12345" and the serial port sends data "= 12345".

start symbol	**Display weight data**	**tailed**

=			1	2	3	4	5	0D	0A

The controller displays: "1234.5", and the serial port sends the data "= 1234.5".

start symbol	**Display weight data**							**tailed**	
=		1	2	3	4	.	5	0D	0A

The controller displays: "-1234.5", and the serial port sends the data "= -1234.5".

start symbol	**Display weight data**							**tailed**	
=	-	1	2	3	4	.	5	0D	0A

4.4.2 Continuous sending mode 2

The transfer data is the current weighing (gross or net weight) displayed by the controller. Each frame consists of 12 sets of data. The format is as follows:

The X bytes	Content and annotation
1	02（XON）
2	+ perhaps-
3	Weighing data
:	Weighing data
:	Weighing data
8	Weighing data
9	The decimal point
10	Oor calibration (different =2 3..... 8 9)
11	Different or verification
12	03（XOFF）

4.5 modification of calibration parameters

1、 **The modification input of calibration parameter modification directly affects the weight calibration parameter, so it is recommended to back up the original calibration parameters first.**

2、 **Calibration parameter modification input to adjust the working zero, the boot zero to set F2.7=0 (close the boot zero)**

3、 **The zero point of the scale should be increased at the zero point, and the zero point of the scale should be increased.**

4、 **The working zero weight can be adjusted by modifying the zero code value. The calculation formula is as follows:**

Zero code modifier = (range code / calibration weight) * (zero weight adjustment)

Note: "(within range code / calibration weight)" is the reciprocal of the calibration coefficient

5、 Calculation formula of the calibration coefficient: Calibration

coefficient = calibration weight / range size

Therefore, the calibration coefficient can be modified by adjusting both the in-range size and the calibration weight. When the calibration coefficient is larger, the display weight becomes larger. The calibration coefficient is smaller weight.

4.6 Examples of the application of the calibration parameter modification

Example 1: The method of adjusting the working zero point by modifying the code value inside the zero point.

For example: a material can filled with materials, according to the volume estimated 80000kg, can actually display 81000kg, if continue to add 1000kg material, display will also increase 1000kg, then the weight is not caused by the zero change, can modify the zero code correction, the zero down 1000kg. For example, if the initial zero code is 3045, the calibration weight is 20000, and the range code is 100000, the calibration coefficient =20000 / 100000=0.2, and the 1000kg zero code modifier = 1000/0.2=5000. According to the scale work zero to lower the zero internal code value to raise the principle, increase the internal code by 5000, that is, the internal code to 3045 + 5000=8045 can be.

Example 2: The method of fine-tuning the weight by using the coefficient correction method.

For example: assuming that the weight on the weighing table is 1000kg and the controller shows 998kg, the calibration coefficient needs to be increased 1000998 times about 1.002 times, the original calibration weight is 2000, the range code is 10000. If the range code is kept unchanged, the calibration weight can be changed to 2000*1.002=2004.

Example 3: The weight calibration parameters will be manually recovered.

For example: the user with the weight calibration method to complete the scale calibration, in order to prevent the future calibration parameter loss, can be in the weight calibration, in the calibration parameter modification input options, record the weight calibration parameters, if the calibration parameter lost, can be recorded in the calibration parameter modification input options, can complete the calibration parameter recovery.

4.7 Example of sensitivity calibration application (this function must be noted before ordering)

Example 1: Weight without calibration

For example: a scale uses 4 sensors with sensitivity of 3.0 and range of 100 kg, score value d=0.01 input parameters in sensitivity calibration: sensor range =100 * 4=400, input

range =C0400.00; input sensitivity =L3.00000

Example 2: Check the sensor for fault

For example: the excitation voltage of the controller is DC5V, if the total range of the sensor is set = sensitivity * 5000, the separation value d=1, then through the sensitivity calibration, the controller displayed weight value is the microvolt voltage value of the sensor, through the stability of this value can directly detect the quality of the sensor.

4.8 Description of the relay output mode

According to 3.8 relay output and switch quantity input setting F5, specific application examples of each control mode are given here to further understand the application (the following example is that the relay illustrates the problem with the normally open contact, the output effectively means that the normally open contact is closed, and the relay closes means that the normally open contact is disconnected)

4.8.1 Output mode 0 (relays 1 and 2 are off no output)

Relay 1 and relay 2 are turned off in any state.

4.8.2 Output mode 1 (real-time fixed value output) for example

Note: Press [Set key] to set the relay parameters directly. In this mode, the input switch has the display zero function

Suppose relay parameters A=500 (1) and B=2000 (2).

Display weight> =500, relay 1 output is valid, otherwise closed.

Display weight> =2000, relay 2 output is valid, otherwise closed.

4.8.3 Output mode 2 (real-time sorting output) for example

Note: Press [Set key] to set the relay parameters directly. In this mode, the input switch has the display zero function

1. Suppose the relay parameter A=500 (lower limit), B=2000 (upper limit), and the sorting parameter F5.1=0.

Display weight <500, relay 1 output is valid, otherwise closed, relay 1 is the lower limit output.

Display weight> 2000, relay 2 output valid, otherwise off, relay 2 is upper output.

2. Suppose relay parameter A=500 (lower limit), B=2000 (upper limit), and sorting parameter F5.1=1.

Show weight <500 Relay 1 output is valid, otherwise off, relay 1 is lower limit output.

500 <= display weight <=2000, relay 2 output is valid, otherwise closed, relay 2 is

qualified output.

3. Suppose the relay parameter A=500 (lower limit), B=2000 (upper limit), and the sorting parameter F5.1=2.

500 <= display weight <=2000, relay 1 output is valid, otherwise closed, relay 1 is qualified output.

Display weight> 2000 Relay 2 output valid, otherwise invalid closed, relay 2 is the upper output.

4.8.4 Output mode 3 (output of external control fixed value) for example

When the input switch is valid, the relay function is the same as the output mode 1.
Relay 1 and relay 2 output are always off when the input switch is invalid.

4.8.5 Output mode 4 (external control sorting output) example

When the input switch is valid, the relay function is the same as the output mode 2.
Relay 1 and relay 2 output are always off when the input switch is invalid.

4.8.6 Output mode 5 (bring back to zero control fixed value output) example

Note: Press [Set key] to set the relay parameters directly. In this mode, the input switch has the display zero function

Suppose relay parameters A=500 (1), B=2000 (2), E=20 (zero zone weight).
Display weight> =500, relay 1 output is valid.
Display weight> =2000, relay 2 output is valid.
Show weight <20, relay 1 and relay 2 output off.

4.8.7 Output mode 6 (quantitative speed and slow feeding) for example

Note: Press [Set up key] to set the relay parameters directly.

Variable settings	explanatory note	Variable settings	explanatory note
F5.0=6	**Mode 6; relay 1 is fast, relay 2 is slow**	C1=1.0	The start delay time is 1.0 seconds

F5.2=1	Before adding, =1 zero, =0 peeling, =2 no zero, no peeling	C2=2.0	The stable delay time is 2.0 seconds
F5.3=0	Fast overtime, fast add and slow add relay output	C3=1.5	The prohibited comparison time is 1.5 seconds
C4=2.5	The feeding delay time is 2.5 seconds	C5=2.0	The dot time is 2.0 seconds
C6=05	The cycle delay time is 5 seconds	C7=3	The number of cycles is 3 times
A=2000	Feed target value is 2000; start once, controller feed 2000;		
b=100	The fast addition advance amount is 100, and when the expected (2000-100) =1900, the fast addition will end and enter the slow addition state;		
c=20	The slow addition advance amount is 20, when expected (2000-20) =1980, the slow addition ends when the feeding stops;		
E=10	The weight of zero zone is 10. When the feeding weight is less than 10, the weight of the controller has returned to zero zone;		
F=5	The allowable error is 5. When the slow addition is over, the actual weight is less than (2000-5) =1995, make point dynamic feeding.		
The control process is as follows: start the input switch once or click the [Exit key] once, and press the times set by C7 to automatically cycle the ingredients for 3 times. After 1.0 seconds start delay, the controller for zero at the same time into the fast feeding, fast and fast output at the same time, fast to 1900 fast relay off, add to 1980 slow relay off, feed stable delay after 2.0 seconds, then wait for the feeding, when the weight is less than 10, the controller weight has back to zero, then delay 2.5 seconds, a quantitative feeding, and then delay 2 seconds after the cycle into the next ingredients, 3 ingredients automatically exit after ingredients cycle.(R1 is the indicator of relay 1, R2 is the indicator of relay 2, R3 is the feeding process indicator, R4 is the start operation indicator, C2 is the moving feeding interval time)			

4.8.8 Output mode 7 (external control quantitative reduction 1) example

Note: Press [Set up key] to set the relay parameters directly.

Variable settings	explanatory note	Variable settings	explanatory note
F5.0=7	**Mode 7; Relay 1 is reduced and relay 2 is overloaded**	C1=1.0	The start delay time is 1.0 seconds
C2=2.0	The stable delay time is 2.0 seconds, and the interval time is time		
C3=1.5	The prohibited comparison time is 1.5 seconds	C5=2.0	The dot time is 2.0 seconds
C6=05	The cycle delay time is 5 seconds	C7=3	The number of cycles is 3

			times
A=500	The reduction target value is 500, start once, the controller weight reduction is 500;		
b=1	When the advance quantity is 1, reduced (500-1) =499, the reduction relay is closed and the reduction stops;		
C=8000	Overload weight is 8000; when the controller weight is greater than 8000, the overload relay output is effective;		
F=5	The allowable error is 5. After the reduction, if the actual weight is less than (500-5) =495, reduce the point point.		
Reduction control process is as follows: the input switch start once or press the [exit key] point once, press C7 set times for automatic cycle ingredients 3 times, each reduction ingredients to determine whether the weight is more than 500, and then after 1.0 seconds start delay, the controller into the reduction control, the relay output is effective, when 499 relay shutdown, feed stability control after 2.0 seconds, and then delay 2 seconds after the cycle into the next ingredients, 3 ingredients, automatically exit the batching cycle. In addition, when the weighing material weight is more than 8000, the overload relay output is effective.(R1 is relay 1 indicator, R2 is relay 2 indicator, R3 is stability delay indicator, R4 is start operation indicator, C2 and point feeding interval time)			

4.8.9 Output mode 8 (external control quantitative reduction 2) example

Note: Press [Set up key] to set the relay parameters directly.

Variable settings	explanatory note	Variable settings	explanatory note
F5.0=8	**Mode 8; Relay 1 is reduced and relay 2 is fed**	C1=1.0	The start delay time is 1.0 seconds
C2=2.0	The stable delay time is 2.0 seconds, and the interval time is time		
C3=1.5	The prohibited comparison time is 1.5 seconds		
C6=05	The cycle delay time is 5 seconds	C7=3	The number of cycles is 3 times
A=1000	The reduction target value is 1000, start once, the controller weight reduction is 1000;		
b=5	When the advance quantity is 5, reduced (1000-5) =995, the reduction relay is turned off and the reduction stops;		
c=1200	The lower limit of feeding, when the material weight of the scale is less than 1200, the feeding relay output is effective, for the feeding operation;		
d=6000	The upper limit of feeding, when the feed weight of the scale is more than 6000, the output of the feeding relay is closed, and the feeding operation is over;		

F=5	The allowable error is 5. After the reduction, if the actual weight is less than (1000-5) =995, the point action is reduced.
Reduction control process is as follows: the input switch start once or press the [exit key] point once, press C7 set times automatic cycle ingredients 3 times, each reduction ingredients first determine whether the weight is more than 1000, after 1.0 seconds after start delay, the controller into the reduction control, reducing relay output effectively, the feed 995 relay off, the feed stability control after 2.0 seconds, and then delay 2 seconds into the next ingredients cycle, after 3 times complete automatically exit the ingredients cycle. In addition, when the controller shows weight less than 1200, the feeding relay output is effectively fed, and the feeding ends when the controller shows weight more than 6000.(R1 is the relay 1 indicator, R2 is the relay 2 indicator, R3 is the stability delay indicator and R4 is the start up indicator)	

4.8.10 Output mode 9 (external control 2 ingredients) example

Note: Press [Set up key] to set the relay parameters directly.

Variable settings	explanatory note	Variable settings	explanatory note
F5.0=9	**Mode 9; relay 1 is material 1, relay 2 is material 2**	C1=1.0	The start delay time is 1.0 seconds
F5.2=1	Before adding, =1 zero, =0 peeling, =2 no zero, no peeling	C2=2.0	The stable delay time is 2.0 seconds
C3=1.5	The prohibited comparison time is 1.5 seconds	C4=2.5	The feeding delay time is 2.5 seconds
C5=1.0	The dot time is 1.0 seconds and the intermittent time is C2=2.0 seconds		
C6=05	The cycle delay time is 5 seconds	C7=3	The number of cycles is 3 times
A=1000	The target value of material 1 is 1000;		
b=2000	The target value of material 2 is 2000;		
c=20	Material 1 advance quantity is 20, material 1 is expected (1000-20) =980, material 1 relay is closed;		
d=10	When the advance quantity of the material 2 is 10, and the material 2 is expected (2000-10) =1990, the material 2 relay is closed;		
E=50	The weight of zero zone is 50. When the feeding weight is less than 50, the weight of the controller has returned to zero zone;		
F=5	When the tolerance of material 1 is 5, and the actual weight of material 1 is less than (1000-5) =995, the point is added;		
U=10	When the tolerance of material 2 is 10, and the actual weight is less than (2000-10) =1990.		

The control process is as follows: start the input switch once or press [Exit key] to click once, Automatic cycle of the ingredients for 3 times according to the times set by C7, After a 1.0-second start delay, The controller zerzero and enters material 1 batching, When material 1 to 1980, Material 1 relay is off, After a stable time delay of 2.0 seconds, Starting material 2 for feeding, Feed 2 relay is closed when adding feed 2 to 1990, After a stable time delay of 2.0 seconds, Material 2: End of the feeding, Then wait for the feeding, When the scale weight is less than 50, The controller weight has been returned to zero, After 2.5 seconds, Then delay 2 seconds into the next ingredient, Automatic exit the batching cycle after 3 ingredients.(R1 is the relay 1 indicator, R2 is the relay 2 indicator, R3 is the feeding process indicator, and R4 is the startup indicator)

4.8.11 Output mode 10 (ingredient belt of external control 1)

Note: Press [Set up key] to set the relay parameters directly.

Variable settings	explanatory note	Variable settings	explanatory note
F5.0=10	**Mode 10; Relay 1 is feeding, and relay 2 is feeding**		
F5.2=1	Before adding, =1 zero, =0 peeling, =2 no zero, no peeling		
F5.4=1	The feeding mode is manual, press the start button to discharge the feeding	C1=1.0	The start delay time is 1.0 seconds
C2=2.0	The stable delay time is 2.0 seconds, with the intermittent time	C3=1.5	The prohibited comparison time is 1.5 seconds
C4=2.5	The feeding delay time is 2.5 seconds	C5=2.0	The dot time is 2.0 seconds
C6=05	The cycle delay time is 5 seconds	C7=3	The number of cycles is 3 times
A=1000	The target value of the ingredient is 1000;		
b=20	When the advance quantity is 20, and the expected (1000-20) =1980, the feeding relay is closed;		
E=50	The weight of zero zone is 50. When the feeding weight is less than 50, the weight of the controller has returned to zero zone;		
F=5	If the ingredient allowance is 5, after the ingredient, if the actual weight is less than (1000-5) =995, click feeding.		
The control process is as follows: start the input switch once or press [Exit key] to click once, Automatic cycle of the ingredients for 3 times according to the times set by C7, After a 1.0-second start delay, The controller zerzero and enters the ingredients, Adding it to 1980, Feking relay off, After a stable time delay of 2.0 seconds, End of feeding, Then wait for the feeding, When the manual feeding switch is effective (the manual feeding switch is the start switch or press [exit key]), Effective feeding relay output, When the scale weight is less than 50, The controller weight has been returned to zero, After 2.5 seconds, Then delay 2 seconds into the next ingredient, Automatic exit the batching cycle after 3 ingredients.(R1 is the relay 1			

indicator, R2 is the relay 2 indicator, R3 is the feeding process indicator, R4 is the start operation indicator, and then press the start key to exit the batching state)

4.8.12 Output mode 11 (external control instantaneous peak) for example

Note: Press [Set up key] to set the relay parameters directly.

Variable settings	explanatory note
F5.0=11	**Mode 11; Relay 1 is the lower limit and relay 2 is the upper limit.(For rapidly catching peak catch, F2.0=3 or F2.0=4 should be set with filter strength F2.1=0)** The lower limit relay output is valid when the detected peak is less than the set lower limit. When the detected peak is greater than the set upper limit
C1=2.0	The peak holding time was set for 2s. The C1 value is not equal to 0, and the peak hold is automatically deheld after C1 seconds. The C1 value is equal to 0, the peak hold release requires manual input signal, manually press the input switch or press [exit key] can release the peak hold.
A=1000	The lower peak limit is 1000 and the lower limit relay output is valid when the detected peak is <1000
b=1200	The upper peak limit is 1200 and the upper limit relay output is valid when the detected peak is greater than 1200
c=500	The peak start capture threshold is 500. After the peak capture is started, when the force value is greater than 500, the controller starts to pick and save the peak.
d=300	The peak end capture threshold is 300, and after capturing the effective peak, the controller ends the peak capture when the force value is less than 300. Note the requirements when setting the parameters: c> d.
The control process is as follows: start the input switch once or press [Exit key] to click once, and start the peak detection and hold once. When the captured force value is greater than 500, the controller starts to pick the peak. When the force value is less than 300, the peak capture is ended, the display window holds for 2 seconds, and the upper and lower output of the relay also holds for 2 seconds. After 2 seconds, the first peak detection is over, and the next peak detection can be started.(R1 is the relay 1 indicator, R2 is the relay 2 indicator, R3 is the peak hold indicator, R4 is the peak catch run indicator)	

5. Maintenance and precautions

- In order to ensure the clarity and service life of the controller, the controller should not be used in direct sunlight and should be flat.
- Should not be used in serious dust and vibration places, avoid use in a humid and acidic environment!
- The sensor and controller must be reliably connected, the system should be well grounded, away from strong electric field and magnetic field, the sensor and controller should be away from strong corrosive objects, away from flammable and explosive items! Do not use in the combustible gas or flammable steam occasions, do not use in the pressure vessel canning system!
- In the area where lightning occurs frequently, reliable arrester must be installed to ensure the safety of operators and prevent lightning strikes to damage the controller and corresponding equipment!
- Both sensors and controllers are electrostatic sensitive equipment, and anti-static measures must be taken in use, prohibit welding operation or other strong electric field operation on the scale table; In thunderstorm season, reliable lightning protection measures must be implemented to prevent the damage of sensors and controllers caused by lightning strike, to ensure the personal safety of operators and the safe operation of weighing equipment and related equipment!
- It is strictly forbidden to use strong solvents (such as benzene, nitrate oil) to clean the shell!
- Do not inject liquid or other conductive particles into the controller in case of controller damage and electric shock!
- Before plugging and plugging the controller and external equipment, cut off the controller and the corresponding equipment! Before plugging and plugging the sensor cable, the controller must be cut off! Before plugging and unplugging the large screen cable, the controller and large screen power! Before plugging and plugging the communication cable, the power supply of the controller and the upper machine!
- Controller external interface must be strictly in accordance with the method marked in the instruction manual, shall not change the connection without authorization, the controller in the use process of failure, should immediately pull out the power plug, send professional factory maintenance, general not weighing professional manufacturers repair not to avoid more damage, the controller is not allowed to open, otherwise not warranty.
- This controller within one year from the date of sales, under normal use

conditions, the non-human fault is within the warranty scope.

- The customer shall accept the quality of the products within seven days from the delivery date of goods. After this period, there will be no objection to the quality of the goods delivered this time
- The company advises the customer: the controller should be tested and accepted before using the controller. The company is only responsible for the quality of the controller itself, the responsibility shall not exceed the sales price of the controller itself, and is not responsible for the system problems of the controller.

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