



AMC401-J

Instruction Manual for Reduction Controller



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This product carries out the standard:

GB/T 7724-2008 National standard of <electronic weighing instrument>

JJF1624-2017 Type evaluation outline of <digital weighing indicator (weighing indicator) >

JJG649-2016 Verification regulation of digital weighing indicator (weighing indicator)



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i. Basic information

1.1. Features and Specifications

The AMC401-J is a quantitative controller designed for industrial weighing using the subtractive method. The controller features a compact size, stable performance and rich interfaces. It supports batch Settings and has a bag clamping and loosening control function. After automatically determining stability, it conducts a reduction control process and controls the feeding based on the weight of the hopper. It has a cumulative value storage of up to 15 digits, and each of the 20 groups of recipes has its own cumulative recipe data. Users can also use the Chinese touch screen interface compiled by our factory in combination to further enhance the usability of the product.

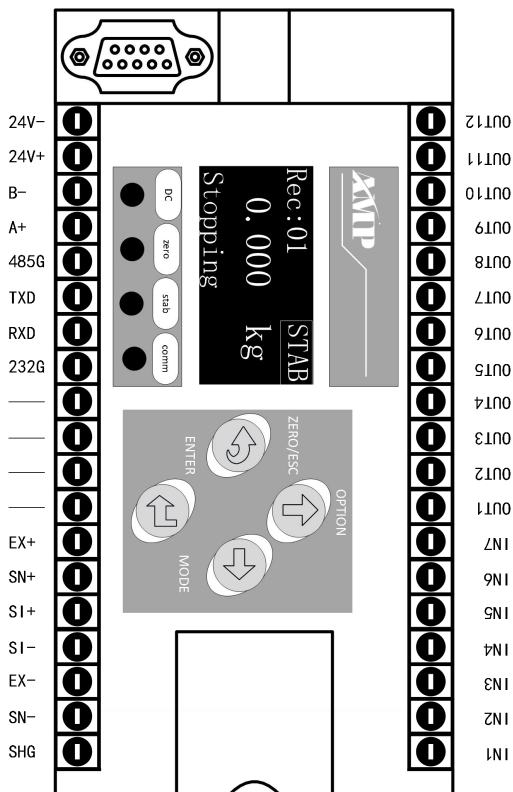
The AMC401-J has the following basic characteristics:

- Automatic reduction and quantitative control
- Working voltage: DC24V
- Weighing channel: Single channel
- Sensor: DC5V/4-6 wire resistance strain bridge load cell
- Switch quantity: 7 inputs /12 outputs
- Communication interface: RS485, RS232, supporting Modbus-RTU protocol.
- Installation method Guide rail (or screw fastening
- Volume: 120×80×61 (length, width, height, mm, excluding protruding parts)

The detailed technical specifications are as follows:

Sensor excitation	DC5V $\pm$ 10%/120mA driving current/can be connected in parallel with 8 sensors of 350 Ω specification
Adapt to sensor sensitivity	2mV/V or 3mV/V
Input signal range	0~15mV
Input sensitivity	0.5uV/d
nonlinear	0.02% FS (at 3mV/V)
zero drift	<0.5 μ V/ $^{\circ}$ C
Gain drift	<10PPM/ $^{\circ}$ C
AD conversion rate	960 times/second
Highest display resolution	1/9999999
Product accuracy level	Ⓐ
Working Voltage	DC24V (compatible with 18V~30V)
Product power consumption	<5W
Operating Temperature	-10 $^{\circ}$ C~45 $^{\circ}$ C
Storage temperature	-20 $^{\circ}$ C~60 $^{\circ}$ C
humidity	Within 90% RH (no condensation)

1.2. Front panel



The front panel of the instrument is composed of a liquid crystal display, four indicator lights and four buttons.

The explanation is as follows:

Indicator light	
Comm	When the serial port receives an instruction and responds, the indicator light will light up once
DC	It remains bright when powered on.
Zero	The zero point of the controller's weight is

	always on
Stab	The controller’s weight is stable and it often lights up
Key press	
 ZERO	1. Press a key on the menu interface to exit the upper-level menu at one time. 2. The standby state key performs a reset operation once. 3. Long press in standby mode to perform the zero calibration operation. 4. In the numerical input interface, long press to clear the input data. 5. The alarm can be cleared when alarm happened.
 OPTION	1. For the menu and selection interface, move the cursor upwards. 2. In the numerical input interface, increase the flashing number by 1.
 MODE	1. In the menu and selection interface, move the cursor down. 2. In the numerical input interface, move the cursor to the right to flash.
 ENTER	1. Menu and selection interface, confirm entry to the current option. 2. In the numerical input and option interface, confirm to save the current data.

1.3. Wiring port

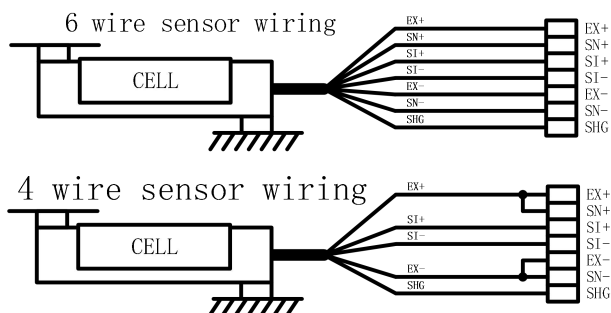
The wiring port description is as follows:

Category	Interface	Explanation
Power	24V	DC24V power supply positive

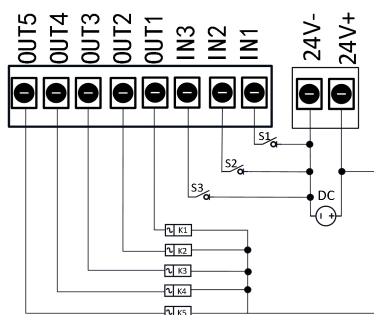
supply	24G	DC24V power supply negative	
Sensor Interface	EX+	Sensor excitation positive	
	EX-	Sensor excitation negative	
	SI+	Sensor signal positive	
	SI-	Sensor signal negative	
	SN+	sensor senses positive.	
	SN-	Sensor senses negative	
	SHG	Sensor shielding wire	
Serial port (RS485)	A+	RS485 A+	
	B-	RS485 B-	
	485G	RS485 GND	
Serial port (RS232)	TXD	RS232 TXD	
	RXD	RS232 RXD	
	232G	RS232 GND	
output	OUT1	output 1	Q1. Running
	OUT2	output 2	Q2. Stop
	OUT3	output 3	Q3. fast
	OUT4	output 4	Q4. Med
	OUT5	output 5	Q5. Slow
	OUT6	output 6	Q6. Result hold
	OUT7	output 7	Q7. Over/under
	OUT8	output 8	Q8. warning
	OUT9	output 9	Q9. Clamp Bag
	OUT10	output 10	Q10. Supply fill
	OUT11	output 11	Q11. Batch completion
	OUT12	output 12	Q12. Pat bag
input	IN1	input 1	I1. Start
	IN2	input 2	I2. Stop
	IN3	input 3	I3. Pause

	IN4	input 4	I4. Zero
	IN5	input 5	I5. Clear the alarm
	IN6	input 6	I6. Clamp/unclamp
	IN7	input 7	I7. Choose Rec.

1.3.1.Sensor wiring method



1.3.2. IO wiring method



The external circuit driven by the following two points:

1. The external circuit should share with the controller;
2. When the external circuit is input at a low level, the input is valid, otherwise, the input is invalid.

The external circuit driven by the output switching quantity should

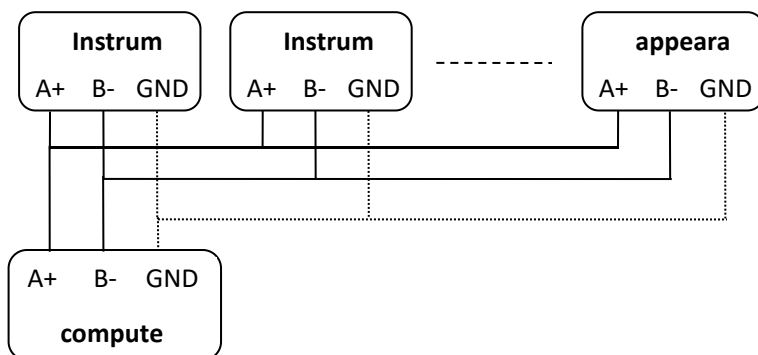
meet the following two main points:

1. The external circuit should share with the controller;
2. The switching output is low.

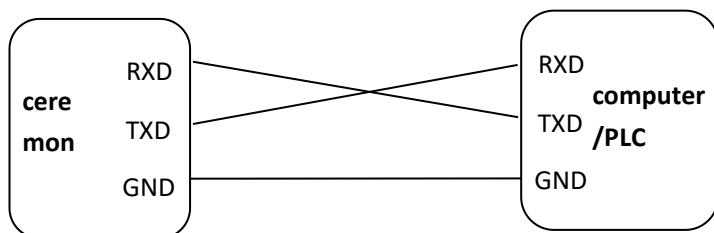
Note: The maximum driving capacity of each switching output port is 500 mA. Please pay attention to the power of the load when connecting the load. Over the driving capacity of the output port may cause damage to the switching output port.

1.3.3. Comm wiring method

RS 485 Wiring signal:



RS232 wiring diagram:



1.4. Extension interface

The controller can be optionally equipped with the following expansion boards:

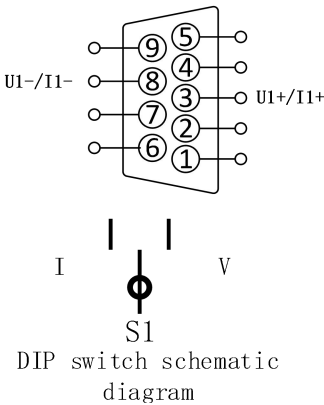
- ① Analog quantity expansion board
- ② IO quantity expansion board

The controller can automatically recognize the expansion board.

1.4.1. Analog output expansion

The controller can be optionally equipped with analog functions (at this time, switch quantity expansion cannot be selected). The interface form is DB9 type plug. One analog signal can be optionally equipped. The voltage or current can be selected through the dip switch. For details on analog functions, please refer to the 2.9 Analog quantity section.

The interface is defined as follows:



DB9	specification
NO.1 lead foot	empty
NO.2 lead foot	empty
NO.3 lead foot	U1+/I1+
NO.4 lead foot	empty
NO.5 lead foot	empty
NO.6 lead foot	empty
NO.7 lead foot	empty
NO.8 lead foot	U1-/I1-
NO.9 lead foot	empty

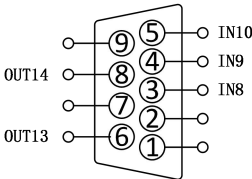
Note

The dip switch is on the power board. To change the output, the instrument needs to be disassembled. The voltage or current output can be selected and configured at the factory.

1.4.2.IO quantity expansion

The controller can be optionally equipped with a switch quantity expansion board (analog quantity expansion cannot be selected at this time), and the interface form is DB9 type plug. It can provide an additional 3 input and 2 output switch quantity interfaces. The controller can automatically recognize the expansion board. When the switch quantity expansion board is connected, the switch quantity related function interface will automatically display the added switch quantity function definitions.

The interface is defined as follows:

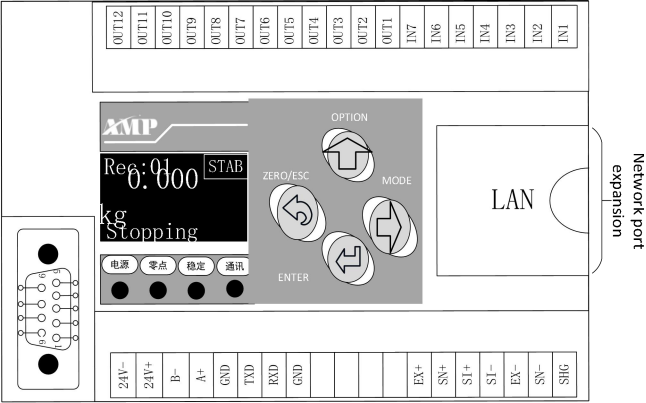


Note: Switch quantity expansion and analog quantity expansion cannot be selected simultaneously.

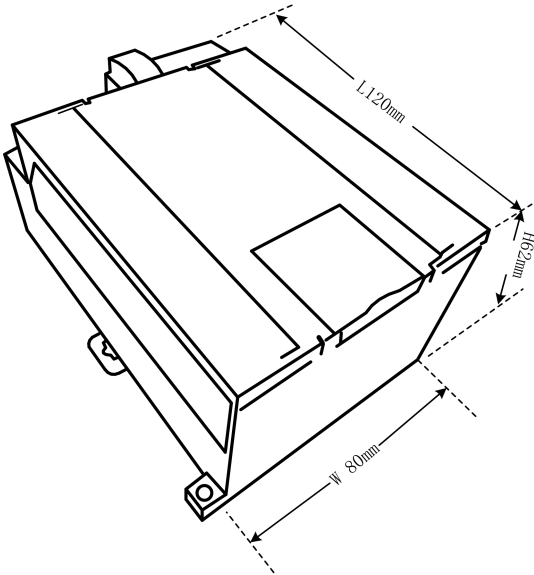
DB9	specification
NO.1 lead foot	empty
NO.2 lead foot	empty
NO.3 lead foot	IN8
NO.4 lead foot	IN9
NO.5 lead foot	IN10
NO.6 lead foot	OUT13
NO.7 lead foot	empty
NO.8 lead foot	OUT14
NO.9 lead foot	empty

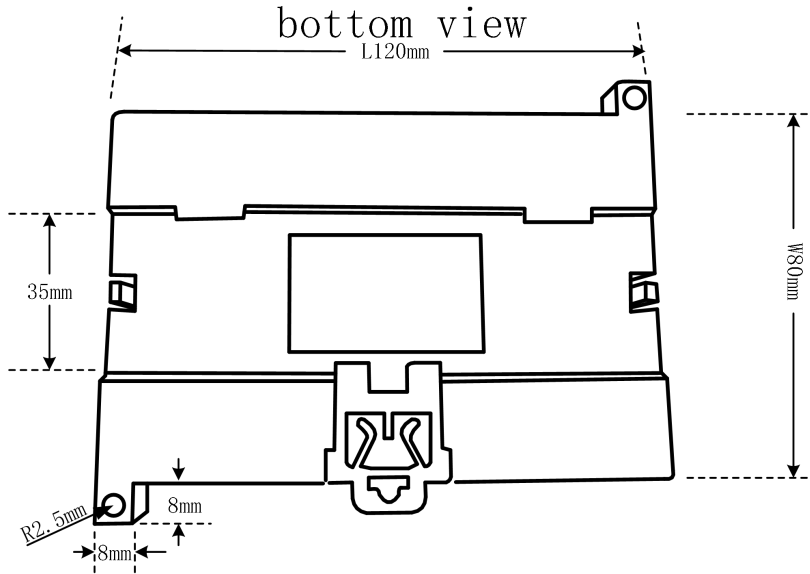
1.4.3.Network port expansion

The controller can be optionally equipped with a network port expansion board.



1.5. Installation dimensions





ii. Function Menu

Under the standby interface, pressing  can lead to the function menu selection interface, that can set and view the various function configurations of the controller. The main menu is shown in the following table:

number	Project	Explanation
1	calibration	Operations related to weight calibration.
2	weigh para	Basic parameters for weight collection and processing.
3	Scale Para	Parameters related to functional process control.
4	Recipe setting	20 sets of product recipe parameters.
5	I/O	Definition of switch functions and port testing.
6	ACC data	Cumulative data and preset batch viewing and setting.
7	Comm setting	Parameter Settings related to the communication serial port.
8	Logic	Parameters related to logic programming.
11	System	Parameter reset, system language selection and version viewing.
13	Analog	Parameters related to analog.

Each project has a password function, allowing you to choose whether to open the entry password for that project.

All passwords are factory-default "000000".

2.1. Weight calibration

For the relevant operations of weight calibration in this project, if it is the first time to install and use this product or there are any changes to the scale structure, such as replacing the sensor or weighing platform, a weight calibration operation should be carried out to ensure the accuracy of the weight display.

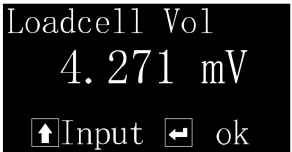
number	Parameter	Explanation	Initial
1.1	Unit	①g/②kg/③t; Select the unit for the system's weight display.	②kg
1.2	point	①0/②0.0/③0.00/④0.000/⑤0.0000 Select the number of decimal places for the system weight display.	①0
1.3	Mini-divi	①1d = 1/②1d = 2/③1d = 5/④1d = 10 ⑤1d = 20/⑥1d = 50 Select the minimum graduation value that the system weight can display.	①1d = 1
1.4	Max range	Set the maximum weighing range. If the displayed weight exceeds the set maximum range, it will show that the weight has exceeded "OFL".	100000
1.5	Loadcell Vol	Display the magnitude of the current voltage signal input by the sensor. ADOFL or -ADOFL indicates that the current sensor signal is abnormal.	
1.6	Zero Clb	Empty the scale platform and  press the confirmed zero point calibration button.	
1.7	Gain	Place an object of known weight on the	

	calibration	weighing platform for gain calibration. After  confirming, enter the exact weight of the placed object.	
1.8	Display wt	After setting the displayed weight, set the corresponding actual weight to complete a quick calibration.	
1.9	Actual wt		
1.10	PSW set	To successfully modify the password, you need to enter the same password twice.	

2.1.1.Weight calibration process

1. Set the parameters such as the weight decimal point, unit, minimum division, and maximum range used by the system properly.
2. Zero-point calibration.

Enter the [1.6 Zero Point Calibration] interface as shown in the following figure:



The main display shows the current voltage magnitude of the sensor. At this time, empty the scale platform. After the

displayed sensor voltage value stabilizes, press  to complete the zero calibration. Calibrate the current sensor voltage signal magnitude to zero point.

3. Gain calibration.
Enter the [1.7 Gain Calibration] interface as shown in the following figure:



The main display shows the voltage magnitude of the current sensor relative to the zero point. At this time, place the weight on the scale platform, wait for the displayed voltage value to

stabilize, and then press  the confirmation key.



After entering the weight of the weights in the pop-up interface,

press  to complete the gain calibration. The voltage relative to the zero point and the input weight will be automatically used for gain calibration.

2.1.2.Quick zero calibration

When in standby or stop mode, hold down the  key for about 3 seconds. After hearing a long beep from the buzzer, release it to quickly set the current state to zero.

Note: The weight needs to be stable when quickly calibrating the zero point.

2.1.3.Fast calibration function

When the controller shows inaccurate weight display during weighing and needs to be recalibrated, the quick

calibration function can also be used to calibrate the weight display of the equipment.

1. After the controller is reset to zero, start the automatic feeding or manually add a certain weight. Once it stabilizes, observe the weight value displayed on the controller and set it to [1.8 display weight].
2. Release the material from the metering hopper and place it on the accurate platform scale for re-weighing. Record the actual weight displayed on the re-scale and set it to [1.9 Actual Weight]. The rapid calibration is then completed.

2.1.4. Calibration Precautions

1. When calibrating the zero point and gain, if the sensor voltage shows ADOFL, it indicates that the current sensor signal is abnormal. It is necessary to check whether the sensor's circuit connection and installation are normal and whether the sensor is damaged.
2. When performing zero-point calibration and gain calibration, the calibration operation can only be carried out if the displayed sensor voltage is stable and does not fluctuate. If abnormal and continuous fluctuations of the sensor voltage are found, it is necessary to check whether the sensor circuit connection and installation are normal and whether the sensor is damaged.
3. Zero-point calibration and gain calibration support manual input of sensor voltage values for calibration. Just press the keys as prompted on  the calibration interface.

2.2. Basic weighing parameters

Set the parameters for the functions related to weight signal acquisition and processing in this project.

number	Parameter	Explanation		Initial
2.1	weighing			
2.1.1	Zero track	0~9d; It only works in the stopped state. When the weight value stabilizes within the positive or negative range of this set value ×d (the minimum division value), it automatically performs zeroing.		0
2.1.2	Zero range	0~99%; When performing the zeroing operation, the weight must be less than or equal to "maximum range × zeroing range" to allow zeroing.		50%
2.1.3	Stab range	1~9d	These two parameters work together to determine whether the weight is stable. Take all the weight values within the "stab time". If the difference between the maximum and minimum values is less than or equal to the "stab range", it is considered that the weight value is stable at this time.	1d
2.1.4	stab time	0.01 ~ 9.9 s		0.5
2.1.5	Filter	0~9; The intensity level of software digital filtering should be set according to the actual debugging effect of the equipment, with appropriate filtering level parameter values.		3

		0: Weakest filtering, fast weight response, and poor anti-vibration effect; 9: Strongest filtering, slow weight response, and excellent anti-vibration effect.	
2.1.6	Power zero	① Off/② On After opening, the controller will automatically perform a zeroing operation each time it is turned on.	① Off
2.2	Parameter password		
2.2.1	switch	① Off/② On Select the password switch for this project.	① Off
2.2.2	modify	To successfully modify the password, you need to enter the same password twice.	

2.3. Scale Parameters

All parameters related to the equipment process control function are set in this project.

2.3.1. Word mode

The functional parameters related to the working mode of the packaging scale can be set.

number	Parameter	Explanation	Initial
3.1	Word mode		
3.1.1	Feed mode	①[Combined]: Fast: The fast signal output is effective. Medium: The med signal output is effective.	①Combined

		Slow: The slow signal output is effective. ②[Independent]: Fast: The output of fast, med and slow signals is effective. Medium: The output of medium and slow signals is effective. Slow: The slow signal output is effective.	
3.1.2	Clamp mode	① Off/② On After opening, determine whether the bag clamping is complete before starting the reduction packaging. Packaging is only carried out after the bag clamping is completed.	② On
3.1.3	Auto Unclamp	① off: After the reduction process is completed, an external manual signal for bag release is required before the bag can be released to end this reduction process. ② on: After the reduction process is completed, the controller automatically loosens the bag.	② On
3.1.4	Ctrl supply	① During operation: It is only determined whether feeding is needed after the operation. ② During operation and shutdown: Determine whether feeding is needed in any state of startup.	0
3.1.5	Power down	① Off/② On	② On

		When opening, if the power is accidentally lost during the packaging process, reconnect the power and continue with the previous packaging process.	
3.1.6	Work mode	①[Packaging]: Start once, run continuously. After one packaging is completed, continue running. The bag clamping device can be set. ②[Batching]: Start once, run for a single time. Stop running after one batching is completed. Do not start when feeding. There is no bag clamping device.	① Packaging

2.3.2. Make a few small moves

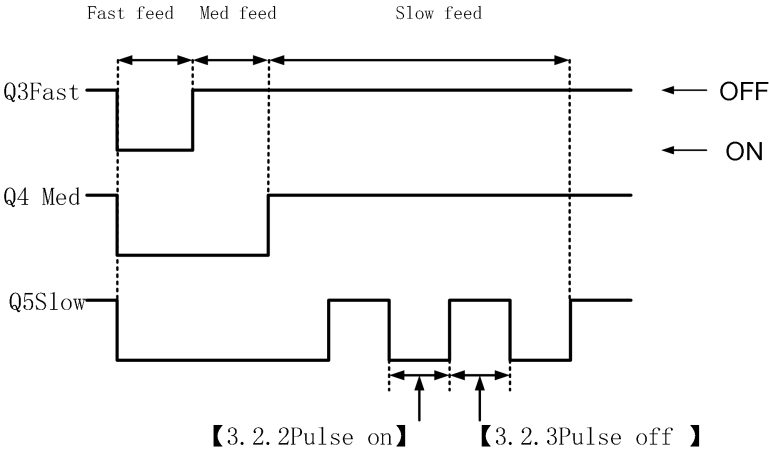
The small feeder point operation function can control the output signal of the small feeder to be output in the form of pulse point operation to control the feeding.

number	Parameter	Explanation	Initial
3.2	Slow pulse		
3.2.1	Pulse function	① Off: The "Q5 Slow" signal will be output in normal level form. ② On: The "Q5 Slow" signal will be output in the form of pulse point motion. Note: The small dosing point operation function only works during the slow feeding process (when only the small	① Off

		dosing signal is output).	
3.2.2	Pulse on	0.0 ~ 99.9 s; The effective time of the output pulse jog of the slow.	0.5
3.2.3	Pulse off	0.0 ~ 99.9 s; The ineffective time of the output pulse jog of the slow.	0.5

2.3.2.1. Detailed description of the slow point operation function

The slow feeding point operation function only works during the slow feeding process. The following figure shows the feeding signal output timing when the parameter [3.1.1 Feeding Mode] is set to ①[Combined].



2.3.3.monitor

The relevant parameter Settings for operation monitoring are as follows:

number	Parameter	Explanation	Initial
--------	-----------	-------------	---------

3.3	Operation monitoring		
3.3.1	Sup. over	0~999s When the feeding time exceeds the set feeding timeout monitoring time, the controller will output a feeding timeout alarm.	0
3.3.2	Plus sup.	① Off/② On After opening, when the feeding time exceeds the limit, suspend the feeding.	① Off
3.3.3	DEC Over	0~999s; When the reduction time exceeds the set reduction timeout monitoring time, the controller will output a reduction timeout alarm.	0
3.3.4	Suspend reduction	① Off/② On After opening, when a reduction timeout occurs, pause the reduction.	① Off

2.3.4.Sew/cut

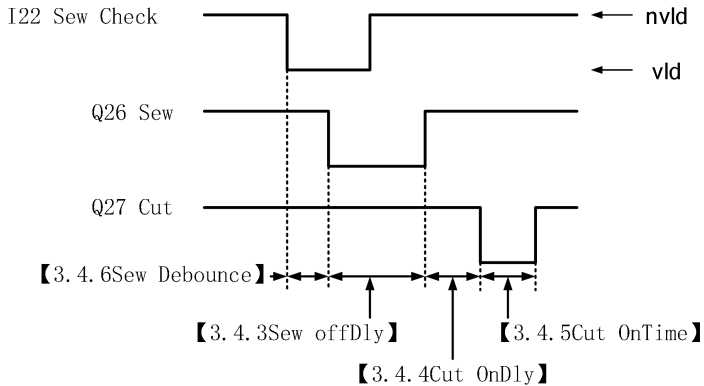
The controller has the function of sewing and tangent control, and can control the sewing and tangent action of the sewing plane. The relevant function parameters are as follows:

number	parameter	explain	Initial
3.4	Sew/Cut		
3.4.1	Sew/cut SW	① Off ② On; when the "I22 sew check" signal input is valid, the sewing and cutting process starts.	① Off
3.4.2	Sew onDly	0.0~99.9s; Delay time before bag sealing starts	0.0
3.4.3	Sew	0~99.9s; Delay time before closing the	4.0

	OffDly	bag sewing. After this time, the "Q26. Sewing" signal is turned off.	
3.4.4	Cut OnDly	0~99.9s; After the bag sewing is completed, start this delay. When the delay expires, the "Q27 cut " signal is output.	0.2
3.4.5	Cut OnTime	0~99.9s; The output time of the "Q27 cut " signal	1.5
3.4.6	Sew Debounce	"I22 sew check" signal input debounce time. If the signal remains continuously valid for this duration, considered valid; if it remains continuously invalid for this duration, considered invalid. Prevents bag sealing errors caused by intermittent signal interruptions or false activations.	0.10

2.3.4.1. Details of the ack function

1. [3.2.1 Sew/cut SW] is set to ②On], and the signal timing diagram of the packet tangent function is as follows:



2.3.5.Parameter password

Set the password switch and password for entering the control parameters.

number	Parameter	Explanation	Initial
3.4	Parameter password		
3.5.1	switch	① Off/② On Select the password switch for this project.	① Off
3.5.2	modify	To successfully modify the password, you need to enter the same password twice.	

2.4.Recipe setting

The controller has 20 sets of recipe parameters available for setting. Users can set the commonly used recipe parameters in advance and switch them to the corresponding recipe numbers when in use.

2.4.1.Recipe

Set the currently selected recipe number.

number	Para	Explanation	Initial
4.1	Recipe		
4.1.1	Rec. num	1~20; Set the currently used recipe number.	1

2.4.2.Target value

This interface sets the target value and other recipe parameters of this recipe number.

number	Parameter	Explanation	Initial
4.2	Target value		
4.2.1	Target	Set the target weight that the packaging aims to achieve.	0
4.2.2	Fast feed	When adding materials, if the weight value $\geq$ the target value - the fast feed, off the fast feeding. When set to 0, it indicates that the large output process will not be initiated.	0
4.2.3	Med feed	When adding materials, if the weight value $\geq$ the target value - the med feed, turn off the med feeding. When set to 0, it indicates that the mid-input output process will not be initiated.	0
4.2.4	Slow feed	When adding materials, if the weight value $\geq$ the target value - the slow feed, off the slow feeding.	0
4.2.5	Upper limit	The upper and lower limit values are used to control the feeding. Feeding starts when the weight is lower than the lower limit and	0
4.2.6	Lower limit		0

		stops when it exceeds the upper limit.	
--	--	--	--

2.4.3. Time setting

Set the relevant time parameters during the reduction process.

number	Parameter	Explanation	Initial
4.3	Time setting		
4.3.1	Feed Delay	0.0 ~ 99.9s; The delay time before the start of adding materials.	0.5
4.3.2	Fast DLY	0.0~99.9s; The vibration elimination time at the beginning of the large throw. During this time, the large throw signal remains valid and is not affected by weight. Only after this time ends is it determined whether the weight has reached the lead time for the large throw, and thus the large throw ends.	0.0
4.3.3	Med DLY	0.0 ~ 99.9 s; The vibration elimination time at the beginning of the med operation, during which the med operation signal remains valid and is not affected by weight. Only after this time ends is it determined whether the weight has reached the med operation lead quantity, and thus the med operation ends.	0.0
4.3.4	Slow DLY	0.0 ~ 99.9 s; The vibration elimination time at the beginning of the slow, during which the slow signal remains valid and is not affected by weight.	1.0

		Only after this time ends is it determined whether the weight has reached the slow drop value, and thus the slow ends.	
4.3.5	Fixed	0.0 ~ 99.9 s; After the feeding is completed, the controller will display the feeding result, start the fixed value holding time, and begin unloading when the time is up.	1.0
4.3.6	Clamp DLY	0.0 ~ 99.9 s; 【Q9 Clamp Bag】 After the signal output is valid, it is considered that the bag clamping action has been completed after a delay of this time, and the subsequent process can begin.	0.5
4.3.7	Unclamp DLY	0.0 ~ 99.9 s; The delay time before automatic bag loosening.	0.5

2.4.4.Flapping

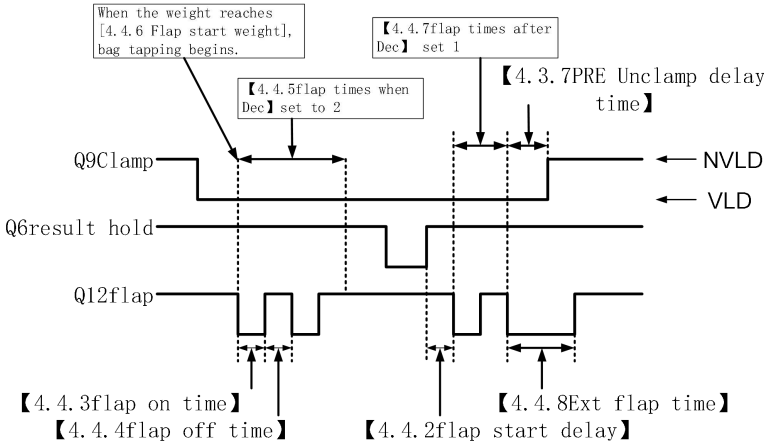
Set the functions related to the bag patting action.

number	Parameter	Explanation	Initial
4.4	flapping		
4.4.1	Check func	① Off/② On After opening it, activate the bag-tapping function.	① Off
4.4.2	Flap start	0.0 ~ 99.9 s; The delay time before the bag-tapping function is activated after setting the value.	0.5
4.4.3	Flap on	0.0 ~ 99.9 s' The effective time of the pulse signal output by the tap	0.5

		bag.	
4.4.4	Flap off	0.0 ~ 99.9 s; The invalid time of the pulse signal output by the tap bag.	0.5
4.4.5	Flap DEC	0~99; The maximum number of times a bag can be tapped during the reduction process. If the reduction process is completed before the number of times the bag is tapped, stop tapping the bag during the reduction.	0
4.4.6	Start WT	If the bag reduction function is enabled, the bag reduction process will commence when the weight reduction value exceeds the initial weight of the bag.	0
4.4.7	Flap after	0~99 After the reduction is completed, the number of times the bags are tapped.	1
4.4.8	Ext flap	0.0 ~ 99.9 s; After Flap after Times is completed, the Ext flap is output. This time and the "4.3.7 Unclamp DLY" are activated simultaneously. It is commonly used in bag-lifting functions. By setting this time longer than the "4.3.7 Unclamp DLY ", it is achieved that after the bag is placed down, the bag is loosened first, then the bag clamping mechanism lifts it again.	0.0

2.4.4.1. Detailed description of the flapping

The bag-tapping function is only effective when [3.1.6 Working Mode] is set to ① packaging mode and [3.1.2 clamping mode] is on. Taking the packaging mode as an example, the signal timing diagrams for all bag-tapping during and after reduction are as follows:



2.4.5.Fall correction

Set the relevant time parameters during the feeding process.

number	Parameter	Explanation	Initial
4.5	Fall correction		
4.5.1	Fall correction	①[Off] ②[on]: Enable the drop correction function.	①Off
4.5.2	Corr. Num	1~99; When the number of packages is equal to the number of drop corrections, make one drop correction.	1

4.5.3	Corr. Ran.	0.1~9.9; The percentage of the target value. All target differences within this range will be used for gap correction, while those outside this value will not be used for gap correction.	0.2
4.5.4	Corr. Sco.	①25% ②50% ③100% The extent of each correction for the fall.	②50%

2.4.5.1. Detailed description of the fall correction function

In some cases, it may be necessary to use the fall correction function to improve packaging accuracy. The drop correction function is to continuously correct the small drop lead during operation. Its principle is as follows:

1. Target difference = the weighing result of this time - target value.
2. The average target difference = (target difference 1 + target difference 2 + ... + Target deviation Corr. Num s) / Corr. Num.
3. The new slow feed = the previous slow feed + The average target difference $\times$ Corr. Sco.

2.4.6. over/ under check

Over-tolerance or under-tolerance is a collective term for over-

tolerance or under-tolerance. During the packaging process, if the packaging result is higher than the target value by a certain range, it is considered over-tolerance, while if it is lower than a certain range, it is considered under-tolerance. This range is set according to production requirements.

number	Parameter	Explanation	Initial
4.6	over/ under check		
4.6.1	Check Func	①Off ②on: After each feeding is completed, the feeding result will be checked for over or under.	①Off
4.6.2	Detection delay	0.0 ~ 99.9 s After the feeding is completed, delay for this period of time and wait for the current weight to stabilize before conducting the over/ under check.	0.5
4.6.3	Over Tol	When conducting over/under check, if the weighing result is > the target value +over TOL, it will be judged as over.	0
4.6.4	Under Tol	When conducting over/under check, if the weighing value < the target value - Under Tol, it is judged as under.	0
4.6.5	Pause	①[Off] ②[On]: When an over/under check error occurs, the controller will alarm and wait for the user to handle it. After clearing the alarm, the operation will continue. Alternatively, a "I2 Stop" signal can be given to return to the	①Off

		stop state for processing.	
4.6.6	Alarm time	0.0 ~ 99.9 s;When an over/under check occurs, the system will output an alarm signal. The duration of this alarm signal is the alarm time. After the time, the alarm signal will be automatically cleared.	2.0

2.4.7.feeding analog

The analog output function requires an optional analog output expansion.

When the controller is equipped with analog expansion, analog output can be used to control feeding. The large, medium and small feeders can respectively correspond to three analog magnitudes to achieve the control of the frequency of the frequency converter or the output voltage of the vibrating feeder with analog quantities, and to perform feeding at different material speeds.

number	Parameter	Explanation	Initial
4.7	Simulated feeding amount		
4.7.1	Large analog	0.000~ 100.000%. During fast feed, the magnitude of the analog output.	0
4.7.2	Med Analog	0.000 ~ 100.000%. During med feeding, the magnitude of the analog output.	0
4.7.3	Slow analog	0.000 ~ 100.000%. During slow feeding, the magnitude of the analog output.	0

Note: The analog output percentage set here is related to the [13.1.1 Output Range] setting, for example:

【13.1.1 Output Range】 Set to 0 to 5V

【4.7.1 Large analog】 Set to 80.000%

【4.7.2 Med Analog】 Set to 40.000%

【4.7.3 Slow analog】 Set to 10.000%

When feeding in large quantities, the analog output is 4V; when feeding in medium quantities, it is 2V; when feeding in slow quantities, it is 0.5V; and when feeding is stopped, it is 0V.

2.4.8.Parameter password

Set the password switch and password for recipe Settings.

number	Parameter	Explanation	Initial
4.7	Parameter password		
4.8.1	switch	① Off/② On Select the password switch for this project.	① Off
4.8.2	modify	To successfully modify the password, you need to enter the same password twice.	

2.5.IO

The functions corresponding to the input and output ports of the switch quantity can be defined, and the switch quantity testing function can be used to test whether the external switch quantity circuit is normal.

2.5.1.IN IO Def

Define the functions corresponding to the input ports IN1 to IN7. Select the switch port you want to set, and then choose the function you want to define in the option box list.

number	Parameter	Explanation	Initial
5.1	Input switch quantity		
5.1.1	IN1	Function definition of switch input port.	I1. Start
5.1.2	IN2		I2. Stop
5.1.3	IN3	For the list of options,	I3. Pause

5.1.4	IN4	please refer2.5.1.1to it.	I4. Zero
5.1.5	IN5		I5. Clear the alarm
5.1.6	IN6		I6. Clamp/unclamp
5.1.7	IN7		I7. Choose Rec.
5.1.8	IN8	Extended switch input function definition (for the option list, please refer2.5.1.1to)	I0. NONE
5.1.9	IN9		I0. NONE
5.1.10	IN10		I0. NONE
5.1.11	IN11		I0. NONE

2.5.1.1. List of switch input functions

Num	Function name	Description
I0	NONE	No function definition.
I1	Start	Start running.
I2	Stop	Stop running.
I3	Pause	Suspend operation.
I4	Zero	Perform a reset operation.
I5	Clear alarm	Clear the alarm status.
I6	Clamp/unclamp	Input signal for bag clamping/loosening operation.
I7	choose Rec.	Enter once valid and switch to the next recipe where the target value is not 0.
I8	Slow stop	Enter the slow-stop process, that is, automatically stop running after the completion of this packaging.
I9	Manual slow	When effective, enable the slow; when effective again, disable the slow.
I10	Manual med	When it is valid, turn on the med investment; when it is valid again, turn it off.

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I11	Manual fast	When effective, enable the large throw; when effective again, disable the large throw.
I12	Clear ALL Acc	Clear the total cumulative data.
I13	Clear Rec. Acc	Clear the current recipe accumulation.
I14	Start/Stop (L)	Effective start, ineffective stop.
I15	Start/Pause (L)	Valid start, invalid pause.
I16	Start/Slow (L)	Effective start, ineffective slow stop.
I17	Manual slow (L)	When effective, enable the slow; when ineffective, disable it.
I18	Manual med (L)	Turn on the middle range when it is effective and turn it off when it is ineffective.
I19	Manual fast (L)	When effective, enable large investment; when ineffective, disable large investment.
I20	End	End the reduction process.
I21	Manual supply	Change the feed output when effective (effective->ineffective or ineffective->effective). Note: It is only valid during the stage before stopping or reducing the volume.
I22	Sew check	The detection input signal for the sewing function activation. For detailed functions, refer to section 2.3.4

2.5.2.OUT IO Def

Define the functions corresponding to the `switch` output ports OUT1 to OUT12. Select the switch port you want to set, and then choose the function you want to define in the option box list.

number	Parameter	Explanation	Initial value
5.2	Output switch quantity		
5.2.1	OUT1	Definition of switch output port function. For the list of options, please refer to 2.5.2.1	Q1. Running
5.2.2	OUT2		Q2. Stop
5.2.3	OUT3		Q3. fast
5.2.4	OUT4		Q4. Med
5.2.5	OUT5		Q5. Slow
5.2.6	OUT6		Q6. Result hold
5.2.7	OUT7		Q7. Over/under
5.2.8	OUT8		Q8. warning
5.2.9	OUT9		Q9. Clamp Bag
5.2.10	OUT10		Q10. Supply fill
5.2.11	OUT11		Q11. Batch completion
5.2.12	OUT12		Q12. Pat bag
5.2.13	OUT13	Expand the function definition of the switch quantity output port. For the list of options, please refer to 2.5.2.1	Q0. NONE
5.2.14	OUT14		Q0. NONE
5.2.15	OUT15		Q0. NONE

2.5.2.1. List of switch output functions

Number	Function	Description
Q0	NONE	No function definition.
Q1	Running	The output is valid when in operation.

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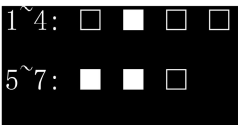
Q2	Stop	The output is valid when in the stopped state.
Q3	fast	fast feeding control signal.
Q4	Med	Med feeding control signal.
Q5	slow	Slow feeding control signal.
Q6	Fixed value	When the reduction is completed, the output is valid, indicating that the reduction has been completed. The duration can be set with the parameter [4.3.5 Fixed]. After the fixed value hold time ends, the current weight will be recorded as the packaging result of this time.
Q7	Over/under	The over/under function is enabled. When an over/under alarm occurs in the feeding result, this output is valid.
Q8	warning	The output is effective when the controller has an alarm.
Q9	Clamp bag	Control signal of the bag clamping mechanism: When effective, the bag is clamped; when ineffective, the bag is released.
Q10	Supply fill	Output signal for material shortage status.
Q11	Batch Comp	The batch completion output is valid.
Q12	Pat bag	Control signal for the bag patting function. For detailed functions, please refer 2.4.4.1.
Q13	Pause	The output is valid in the paused state.
Q14	Slowly stop	The output is valid in the slow-stop state.
Q15	power limit	The output is effective when the weight exceeds the upper limit value.
Q16	Lower limit	The output is effective when the weight is lower than the lower limit value.
Q17	Logic 1	Logic Programming 1 Function output signal.

Q18	Logic 2	Logic Programming 2 Function output signal.
Q19	Logic 3	Logic Programming 3 Function output signal.
Q20	Logic 4	Logic programming 4 Function output signal.
Q21	Logic 5	Logic programming 5 Function output signal.
Q22	Logic 6	Logic programming 6 Function output signal.
Q23	Logic 7	Logic programming 7 Function output signal.
Q24	Logic 8	Logic programming 8 Function output signal.
Q25	Logic 9	Logic programming 9 Function output signal.
Q26	Sew	Sewing bag output control signal For detailed functions, refer to section 2.3.4
Q27	Cut	cut output control signal; For detailed functions, refer to section 2.3.4

2.5.3.IN IO test

number	Parameter	Explanation	Initial
5.3	Input test		

Input testing is a function used to test whether the input switch quantity is working properly. The interface is shown in the following figure:



The upper and lower rows 1 to 4 represent the input ports 1 to 4 for testing. From left to right, each square shows the input states of the seven input switch quantity ports IN1 to 4 and IN5 to 7 in sequence.



The white square indicates validity.

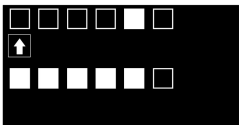


The black square indicates invalid.

2.5.4.OUT IO test

number	Parameter	Explanation	Initial
5.4	Output test		

Output testing is a function used to test whether the output switch quantity is working properly. The interface is shown in the following figure:



The upper and lower rows 1 to 12 represent the output ports 1 to 12 for testing. From left to right, the six squares respectively show the output status of the twelve output switch ports, OUT1 to 6 and IN7 to 12. Press the key to move the cursor, and the key can switch the output to valid or invalid states.

 The white square indicates validity.

 The black square indicates invalid.

2.5.5.Parameter password

Set the password switch and password for entering the switch quantity.

number	Parameter	Explanation	Initial
5.5	Parameter password		
5.5.1	switch	① Off/② On Select the password switch for this project.	① Off
5.5.2	modify	To successfully modify the password, you need to enter the same password twice.	

2.6. Acc data

View the batch and cumulative data as well as the recipe cumulative data of the controller.

2.6.1. Batch & Acc

View the cumulative value of the control and set the number of batches to run. The interface is shown as follows:

number	Parameter	Explanation	Initial
6.1	Batch & Acc		
6.1.1	Batch set	Set the quantity of packaging. When the number of runs reaches the set batch number, the packaging process will be stopped and an alarm will be triggered to remind. Turn off this function when it is set to 0.	0
6.1.2	Completed batch	If the batch count is set, this item will display the batch count that has been completed so far.	0
6.1.3	Manual Disc	Set whether the weight of the manually discharged material is included in the cumulative data. ① No record ② record	①No record
6.1.4	Acc Num	To view the Acc, press the confirmation key to clear the Acc data and start accumulating again.	
6.1.5	Acc Wt		

2.6.2.Recipe accumulation

You can view the cumulative data of each recipe and clear its cumulative data.

Serial number	Parameter	Explanation	Initial value
6.2	Recipe accumulation		
6.2.1	Rec. 1	Check the cumulative data of each recipe. Press  the button to clear its accumulation.	
6.2.2	Rec. 2		
6.2.3	Rec. 3		
6.2.4	Rec. 4		
6.2.5	Rec. 5		
6.2.6	Rec. 6		
6.2.7	Rec. 7		
6.2.8	Rec. 8		
6.2.9	Rec. 9		
6.2.10	Rec. 10		
6.2.11	Rec. 11		
6.2.12	Rec. 12		
6.2.13	Rec. 13		
6.2.14	Rec. 14		
6.2.15	Rec. 15		
6.2.16	Rec. 16		
6.2.17	Rec. 17		
6.2.18	Rec. 18		
6.2.19	Rec. 19		
6.2.20	Rec. 20		

2.6.3. Parameter password

Set the password switch and password for entering the cumulative data.

number	Parameter	Explanation	Initial
6.3	Parameter password		
6.3.1	switch	① Off/② On Select the password switch for this project.	① Off
6.3.2	modify	To successfully modify the password, you need to enter the same password twice.	

2.7. Comm Setting

2.7.1. RS232

RS232 is the RS232 communication serial port of the controller. The relevant parameters are as follows:

number	Parameter	Explanation	Initial	
7.1	RS232 Settings			
7.1.1	Slave ID	1~99; Set the communication address (slave number) of the device.	1	
7.1.2	protocol	①Modbus-RTU-H: Modbus-RTU communication protocol (two-word data with the high word first). ②Modbus-RTU-L: Modbus-RTU communication protocol (the lower word of the two-word data comes first).	①MODBUS-RTU-H	
7.1.3	Baud rate	①4800/②9600/③19200/④38400/⑤57600	④38400	
7.1.4	Data	①7-E-1/②7-O-1/③8-N-1/④8-E-1/⑤8-O-1	③8-N-1	

	format		
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2.7.2.RS485 Settings

For the setting method, please refer to 2.7.1RS232 Settings.

2.7.3.Ethernet port Settings

When the controller is equipped with a network port expansion board, the relevant parameters of the network port can be set. The communication protocol of the network port is Modbus TCP. The relevant parameters are as follows:

num	Para	Explanation	Initial
7.3	Ethernet port Settings		
7.3.1	IP address	Set the IP address of the controller.	192.168 .0.100
7.3.2	Port	The port number for network port communication.	502
7.3.3	MAC	The offset value of the MAC address for network port communication.	0
7.3.4	protocol	1.Modbus-TCP-H: Modbus-TCP communication protocol (two-word data with the high word first). 2.Modbus-TCP-L: Modbus-TCP communication protocol (two-word data with the lower word first).	1.Modbus-TCP-H

2.7.4.Parameter password

Set the password switch and password for entering the communication interface.

Serial	Parameter	Explanation	Initial
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7.3	Parameter password		
7.3.1	switch	① Off/② On Select the password switch for this project.	① Off
7.3.2	modify	To successfully modify the password, you need to enter the same password twice.	

2.8.Logic

The controller supports 9-channel logic programming function. When the existing functions of the controller cannot meet the control requirements of the equipment, you can try to use the logic programming function to define auxiliary logic output signals outside the controller's operation process to control the equipment's actions.

The following takes Logic Programming 1 as an example to explain the functions of each parameter.

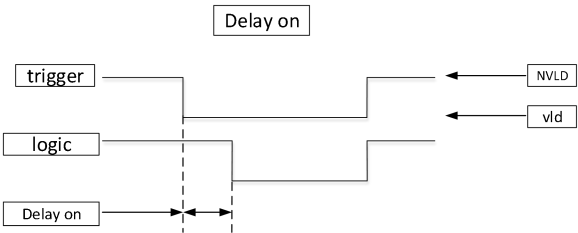
number	Parameter	Explanation	Initial
8.1	Logic Programming 1		
8.1.1	Logical type	Select the type of logic programming. ①close: Disable this logical output function. ②Delayed on ③Delayed off ④Delayed on and delayed off ⑤off-on edge ⑥on-off edge ⑦Self hold ⑧Pulse For detailed descriptions of the	① close

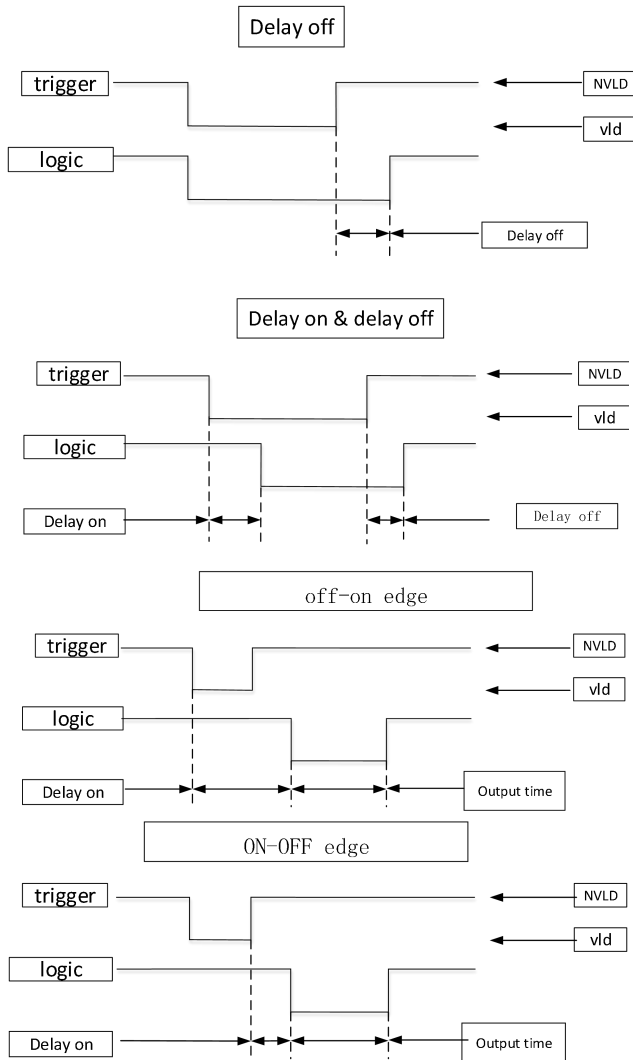
		corresponding functions, please refer to the section	
8.1.2	Trigger type	①Signal Trigger: Trigger the logic output through a certain signal. ②Condition Trigger: Trigger the logical output by meeting a certain condition. ③Comm Trigger: Trigger this logic output through communication commands.	①Signal Trigger
8.1.3	Signal output	Select this logical output signal to be defined to a certain OUT output port.	None
8.1.4	On time	The time when the logic output signal is delayed and connected.	0
8.1.5	Off time	The time when the logic output signal is delayed and disconnected.	0
8.1.6	Signal 1	Select the signal 1 used to trigger the logical output.	no
8.1.7	Signal logic	Select the logical relationship between trigger signal 1 and trigger signal 2 used to trigger the logical output. 1. [or]: If either trigger signal 1 or trigger signal 2 is valid, the logical output will be triggered. 2. [and]: Both trigger signal 1 and trigger signal 2 must be valid to trigger the logical output. 3. [XOR]: The logical output can	1. [or]

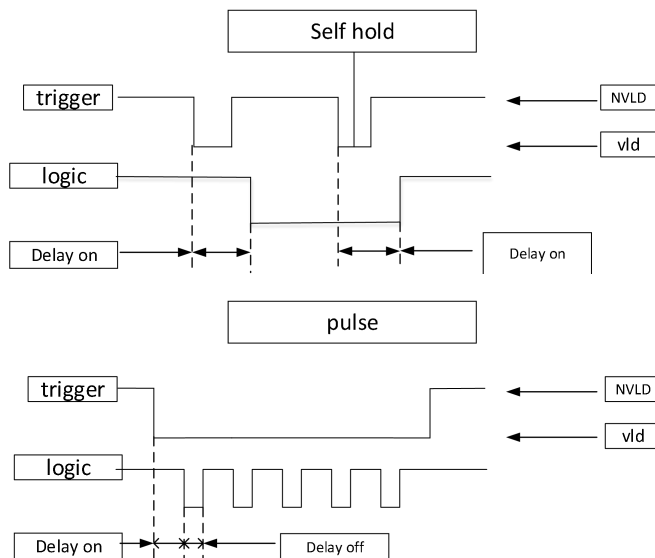
		only be triggered when the trigger signal 1 and trigger signal 2 are different.	
8.1.8	Output time	【 8.1.1 Logic Type 】 This parameter can be set when it is set to the 5th or 6th item. The valid time output after the logic signal is triggered, and the logic output ends when the time is up. When this time is set to 0, the logical output signal can only end through the reset signal.	0
8.1.9	Init signal	【 8.1.1 Logic Type 】 This parameter can be set when it is set to the 5th or 6th item. After the logical output is valid, the reset signal can reset the logical output, making the logical output signal invalid and ending the current logical output process.	None
8.1.10	Init type	1.ON Init: Reset the logic output when the reset signal is valid. 2.OFF Init: Reset the logic output when the reset signal is invalid. 3.off-on Init: When the reset signal changes from invalid to valid, reset the logic output. 4.on-off Init: When the reset signal changes from valid to invalid, reset the logic output.	1. ON Init

8.1.11	condition	Select the conditions that trigger the logical output. 1.more set value 2.less set value 3.inside range 4.outside range	1. more set value
8.1.12	value 1	It is used to set the weight value corresponding to the trigger condition.	0
8.1.13	value 2		0
8.1.14	Need Stable	1.[Off]: The logical output can only be triggered when the weight meets the trigger conditions and needs to be stable. 2.[On]: Once the weight meets the trigger condition, the logical output can be triggered without the need for stabilization.	1.Off
8.1.15	Signal 2	Select the signal used to trigger the logical output 2.	no

2.8.1.Logical output sequence diagram







2.8.2. For example

The coding function is realized through logic programming: After the bag-clamping output signal is valid, it delays for 1 second, and then outputs OUT12 for 2 seconds to control the coding machine to print the code onto the bag after the bag-clamping is completed.

Settings are as follows:

【8.1.1 Logic Type 】 : Invalid - Valid jump edge triggered

【8.1.4 On time 】 : 1 second

【8.1.8 Output Time 】 : 2 seconds

【8.1.2 Trigger Type 】 : Signal trigger

【8.1.6 Signal 1】 : Bag clamp

【8.1.3 Signal Output】 : OUT12

Through the coordination of different trigger signals, trigger conditions and logic programming signals, very flexible logic signals can be combined and output.

For example, to implement the following logic: When the weight exceeds 100kg in real time, output OUT10 for alarm indication. And after the alarm is valid, it delays for 2 seconds and outputs OUT11 for 3 seconds to control the unloading mechanism to discharge the material.

Settings are as follows:

Logic Programming 1: Achieve an output of OUT10 when the detected weight exceeds 100kg.

【8.1.1 Logic Type 】 : Delayed connection

【8.1.4 On time 】 : 0s

【8.1.2 Trigger Type 】 : Conditional trigger

【8.1.11 Condition 】 : Weight greater than the set value

【8.1.12 Value 1】 : 100kg

【8.1.3 Signal Output】 : OUT10

Logic Programming 2: Achieve a delay of 2 seconds after OUT10 becomes effective, and output OUT11 for 3 seconds.

【8.1.1 Logic Type 】 : Invalid - Valid jump edge triggered

【8.1.4 On time 】 : 2 seconds

【8.1.8 Output Time 】 : 3 seconds

【8.1.2 Trigger Type 】 : Signal trigger

【8.1.6 Signal 1】 : Logical output 1

【8.1.3 Signal Output】 : OUT11

2.9. Analog quantity

The analog output function requires an optional analog output expansion.

Analog interface

U1+ / I1+: The positive terminal of the analog output of voltage/current type.

U1- / I1- : The negative terminal of the analog output of voltage/current type.

The voltage type output analog quantity is connected to U1+ and U1-.

The current type output analog quantity is connected to I1+ and I1-.

Select the output voltage/current type analog quantity through the dip switch.

2.9.1. Output Settings

Set the relevant parameters of the analog output function.

Serial number	Parameter	Explanation	Initial value
13.1	Output Settings		
13.1.1	Output range	①[0-5V] ②[0-10V] ③[4-20mA] ④[0-20mA] ⑤[0-24mA] ⑥[user set U] ⑦[user set I]	①[0-5V]
13.1.2	Out mean	① Off ② Feeding: When feeding, the	②feeding

		analog quantities corresponding to fast, med and slow can be output respectively to control the feeding device to add materials (for detailed functions, please refer 2.4.7 to the section).	
13.1.3	Out max	【13.1.1 Output Range】 When set to ⑥[user set U] or ⑦[user set I], the output range of the voltage or current can be customized through these two parameters.	5
13.1.4	Out min		0

2.9.2. Analog quantity calibration

The calibration operation of analog quantities: When there is a deviation between the output value of the analog quantity and the actual value, the analog quantity calibration function can be used to calibrate the output of the analog quantity.

Analog quantity calibration method

- (1) Enter the [13.2 Analog Calibration] interface and switch the dip switch to the voltage analog output terminal.
- (2) Enter the [13.2.1 [0V]] option interface. At this point, use a multimeter to measure the voltage magnitude of the analog output (normally it should be around 0V), input the measured value into the interface and press Confirm.
- (3) Enter the [13.2.2 [2.5V]] option interface. At this point, use a multimeter to measure the voltage magnitude of the analog output (normally it should be around 2.5V), input the measured value into the interface and press Confirm.
- (4) Enter the [13.2.3 [5V]] option interface. At this point, use a

multimeter to measure the voltage magnitude of the analog output (normally it should be around 5V), input the measured value into the interface and press Confirm.

- (5) Enter the [13.2.4 [7.5V]] option interface. At this point, use a multimeter to measure the voltage output by the analog quantity U1 (normally it should be around 7.5V), input the measured value into the interface and press Confirm.
- (6) Enter the [13.2.5 [10V]] option interface. At this point, use a multimeter to measure the voltage magnitude of the analog output (normally it should be around 10V), input the measured value into the interface and press Confirm.
- (7) After the above operations, the calibration operation of the analog quantity can be completed.

When measuring the output voltage, please ensure that the multimeter is in the DC voltage range. Connect the positive test leads to the analog terminal output port of the controller (pin 3 of DB9), and the negative test leads to the analog terminal output port of the controller (pin 8 of DB9).

The current calibration operation is similar to the voltage calibration operation. When calibrating the current, the dip switch needs to be set to the current analog output terminal, and the calibration parameters should be selected from the options [13.2.6 [0mA]] - [13.2.10[24mA]].

Note that the password for switching the analog quantity calibration type is "000000".

number	Parameter	Explanation	Initial
13.2	Analog quantity calibration		
13.2.1	[0V]	From 0.000 V to 12.000 V; Analog output 0V calibration point.	0.000
13.2.2	[V] 2.5	From 0.000 V to 12.000 V	2.500

		Analog output 2.5V calibration point.	
13.2.3	[5V]	From 0.000 V to 12.000 V Analog output 5V calibration point.	5.000
13.2.4	[V] 7.5	From 0.000 V to 12.000 V Analog output 7.5V calibration point.	7.500
13.2.5	[10V]	From 0.000 V to 12.000 V Analog output 10V calibration point.	10.000
13.2.6	[0mA]	0.000 ~ 26.000 mA Analog output 0mA calibration point.	0.000
13.2.7	[4mA]	0.000 ~ 26.000 mA Analog output 4mA calibration point.	4.000
13.2.8	[12mA]	0.000 ~ 26.000 mA Analog output 12mA calibration point.	12.000
13.2.9	[20mA]	0.000 ~ 26.000 mA Analog output 20mA calibration point.	20.000
13.2.10	[24mA]	0.000 ~ 26.000 mA Analog output 24mA calibration point.	24.000

Note: When resetting all parameters, do not reset the analog output Settings and calibration data. For analog parameters, select [13.1.10 Analog] separately to perform the reset operation of the analog parameters.

2.9.3.Parameter password

Set the password switch and password for entering the analog quantity interface.

number	Parameter	Explanation	Initial
9.3	Parameter password		
9.3.1	switch	① Off/② On	① Off

		Select the password switch for this project.	
9.3.2	modify	To successfully modify the password, you need to enter the same password twice.	

2.11. System

View system language Settings and system version information.

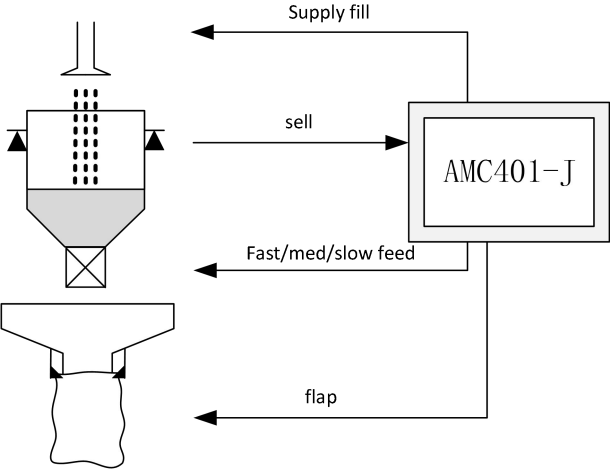
number	Parameter	Explanation	Initial
11.1	Parameter reset		
11.1.1	All parameters	 The key can reset the selected parameter items.	
11.1.2	Cal para		
11.1.3	Wt para		
11.1.4	Scale para		
11.1.5	Recipe		
11.1.6	IO		
11.1.7	Acc data		
11.1.8	Comm port		
11.1.9	Logic		
11.1.10	analog		
11.2	language	① 简体中文/② English	① English
11.3	About	Check the model and version number of the controller.	
11..4	Bott screen	① Off/② On/③ Customization Select the switch displayed on the startup interface.	② off
11.5	BAC & RCV	 The buttons can back up or restore the parameters of the controller (except for the	

		data related to weight calibration).	
11.6	Screen save		
11.6.1	Screen type	① lock screen; If no key is pressed within the screen saver time, the screen will turn off. ②Display weight, If no key is pressed within the screen saver time, only the weight will be displayed, and position will change over time	
11.6.2	Screen time	0~600s;If no key operation during this period, the screen saver interface will be entered. Set to 0 to disable the screen saver.	
11.6	Parameter password		
11.6.1	switch	① Off/② On Select the password switch for this project.	① Off
11.6.2	modify	To successfully modify the password, you need to enter the same password twice.	

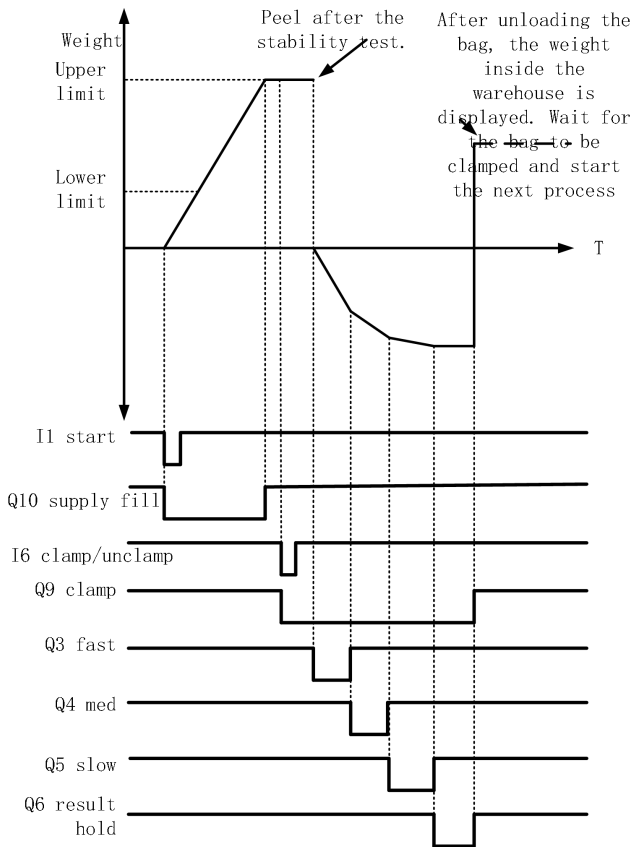
iii. Work process and function description

3.1. The basic structure of a reduction scale

The basic structure diagram of the reduction scale is as follows:



3.2. Packaging mode workflow



Based on the above figure, explain the basic process of the packaging mode of the reduction scale

When in the stopped state, if [3.1.4 Feeding Control] selects ② to supply materials both during operation and at stop, the controller will detect in real time whether the material weight is lower than [4.2.6 lower limit value]. If it is lower than the lower limit value, "Q10" will be

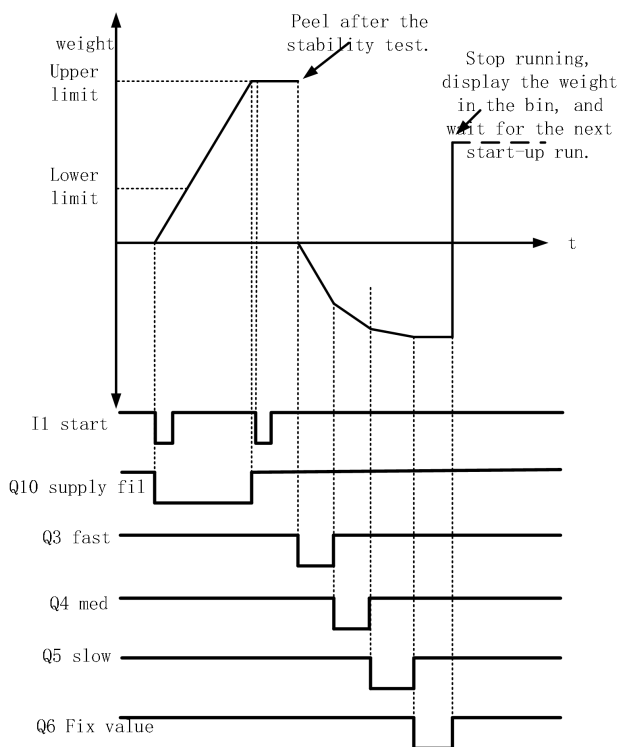
activated. Output the "feeding" signal to add materials to the hopper. Stop feeding when the weight reaches the upper limit value of [4.2.5].

1. After starting the operation, first determine whether the weight of the material is lower than the lower limit value of [4.2.6] and feeding is required. If feeding is necessary, wait for the feeding to be completed.
2. If the switch of the "3.1.2 Bag clamping Device" is turned on, it is necessary to determine whether the bag clamping is completed.
3. Start the "4.3.1 Pre-feeding delay" time. After the time is up, perform a stable peeling process and then begin the feeding process.
4. After initiating the large throw, a period of [4.3.2 Large Throw Ban] will be waited for. Only after this period has passed will the weight comparison begin.
5. Collect the weight in real time and compare it. When the weight value is greater than or equal to [4.2.1 Target Value] - [4.2.2 Large investment lead Amount], turn off "Q3. "Big investment", kicking off "Q4. Med Investment".
6. After the med shot is activated, a period of [4.3.3 Med Shot Ban] will be waited for. Only after this period has passed will the weight comparison begin.
7. Real-time weight collection and weight comparison are conducted. When the weight value is greater than or equal to [4.2.1 Target value] - [4.2.3 input lead amount], "Q4. "Med investment", start "Q5. Slow".
8. After the slow is activated, it will wait for a period of [4.3.4 Slow Ban] time. Only after the time has passed will the weight comparison begin.

9. Real-time weight collection and weight comparison are conducted. When the weight value is greater than or equal to [4.2.1 Target value] - [4.2.4 slow feed], "Q5. slow", finish adding ingredients.
10. After the feeding is completed, if the over-limit and under-limit detection function [4.6.1 Detection function] is enabled, it will wait for a [4.6.2 detection delay] time. Once the time is up, it will be judged that the system is stable, and then the over-limit and under-limit detection will be carried out. If the detection shows an over-deviation or under-deviation, an over-deviation alarm will be output according to the Settings, or the detection will be paused directly.
11. After the over-limit and under-limit detection is completed, if the "4.5.1 Drop Correction" is enabled, the drop correction will be carried out, followed by a fixed value. Wait for the "4.3.5 Fixed Value Hold" time.
12. When the time is up, the setting is completed. At this point, the cumulative total will be recorded and the [4.3.7 Bag Release Delay] time will be initiated. After the delay ends, the bag will be released.
13. After the bag is loosened, the current packaging process ends. Wait for the bag to be clamped before starting the next process.

Note: The process does not include special function descriptions such as over-limit and under-limit detection and bag tapping. If you need to know about a certain function, please refer to the corresponding chapter description of the function.

3.3. Ingredient mode workflow



Based on the above figure, explain the basic process of the batching mode of the reduction scale

When in the stopped state, if [3.1.4 Feeding Control] selects ② to supply materials both during operation and at stop, the controller will detect in real time whether the material weight is lower than [4.2.6 lower limit value]. If it is lower than the lower limit value, "Q10" will be activated. Output the "feeding" signal to add materials to

the hopper. Stop feeding when the weight reaches the upper limit value of [4.2.5].

1. Click "Start Running". First, determine whether the weight of the material is lower than the lower limit value of [4.2.6] and requires feeding. If feeding is needed, wait for the feeding to be completed, and then click "Start Running" again before the operation can begin.
2. Start the "4.3.1 Pre-feeding delay" time. After the time is up, perform a stable peeling process and then begin the feeding process.
3. After initiating the large throw, a period of [4.3.2 Large Throw Ban] will be waited for. Only after this period has passed will the weight comparison begin.
4. Collect the weight in real time and compare it. When the weight value is greater than or equal to [4.2.1 Target Value] - [4.2.2 Large investment lead Amount], turn off "Q3. "Big investment", kicking off "Q4. Med Investment".
5. After the med shot is activated, a period of [4.3.3 Med Shot Ban] will be waited for. Only after this period has passed will the weight comparison begin.
6. Real-time weight collection and weight comparison are conducted. When the weight value is greater than or equal to [4.2.1 Target value] - [4.2.3 input lead amount], "Q4. "Med investment", start "Q5. Slow".
7. After the slow is activated, it will wait for a period of [4.3.4 Slow Ban] time. Only after the time has passed will the weight comparison begin.
8. Real-time weight collection and weight comparison

are conducted. When the weight value is greater than or equal to [4.2.1 Target value] - [4.2.4 small drop Value], "Q5. "Small input", finish adding ingredients.

9. After the feeding is completed, if the over-limit and under-limit detection function [4.6.1 Detection function] is enabled, it will wait for a [4.6.2 detection delay] time. Once the time is up, it will be judged that the system is stable, and then the over-limit and under-limit detection will be carried out. If the detection shows an over-deviation or under-deviation, an over-deviation alarm will be output according to the Settings, or the detection will be paused directly.
10. After the over-limit and under-limit detection is completed, if the "4.5.1 Drop Correction" is enabled, the drop correction will be carried out, followed by a fixed value. Wait for the "4.3.5 Fixed Value Hold" time.
11. When the time is up, the setting process is completed. At this point, the cumulative total amount will be recorded, and then the current batching process will be ended, stopped, and wait for the next start-up operation.

Note: The process does not include descriptions of special functions such as over-limit and under-limit detection. If you need to know about a certain function, please refer to the corresponding chapter description of the function.

iv. Alarm information

When the controller triggers an alarm, it will display the alarm information in the bottom line, as shown in the following figure:

The alarm can be cleared by pressing the button  or entering "I5 Clear Alarm".

For detailed instructions on specific alarms, please refer to the table below

number	"Content	Explanation
1	 The target value is set incorrectly	The recipe parameter [4.2.1 Target] cannot be started if not set. The target value must be set before it can be started.
2	 Zeroing out of range	When performing the zeroing operation, if the weight exceeds the zeroing range, it cannot be zeroed. The parameter Settings of "2.1.2 zero Range" can be adjusted.
3	 It is unstable when reset to zero	During the zeroing operation, the weight is unstable and cannot be zeroed. It is necessary to investigate the cause of the unstable weight jump and whether it is due to mechanical vibration. The determination of stability conditions can also be adjusted by modifying the "2.1.3 Stab Range" and the "2.1.4 Stabilization Time".
4	 It cannot be started during OFL	It cannot be started when the weight overflows.
5	 Over-limit and	The controller enabled the "4.6.1 check Func"

	under-limit alarm	function and set the "4.6.6 Alarm time" time effectively. Moreover, when the feeding result showed an over-limit and under-limit situation, an alarm prompt was issued.
6	 Alarm for material supply timeout	The controller has enabled the feeding timeout monitoring function, and when the feeding time exceeds the [3.3.1 Sup. over] time, an alarm prompt will be triggered.
7	 Alarm for volume reduction timeout	The controller has enabled the reduction timeout monitoring function, and when the reduction time exceeds the [3.3.3 DEC over] time, an alarm prompt will be triggered.
8	 Batch count completed	When [6.1.1 Batch Set] is set and the set number of batches has been completed, an alarm will be triggered.
9	 Zeroing is not allowed	It cannot be reset to zero during operation.

v. Trouble Common Faults

When the controller is running, the bottom line of the display will prompt in real time the function and process that the current controller is performing. Through this prompt, the current running process of the controller can be determined, which helps to troubleshoot. As shown in the following figure, the controller is in the process of large-scale investment:



Some possible faults that the controller may encounter during use and their troubleshooting methods are shown in the following table

number	Content	Explanation
1	ADOFL / - ADOFL	The sensor signal is abnormal. 1. The sensor circuit is wrongly connected and the contact is poor. (Pay attention to the connection methods of four-wire and six-wire systems) 2. The sensor is damaged. 3. The load on the sensor exceeded its range.
2	OFL / -OFL	When the weight in the hopper exceeds the set value of [1.4 maximum range], an OFL prompt will be given. If the empty scale shows "OFL", please check 1. 【1.4 Max Range】 Is the setting correct? 2. Calibration is abnormal. Recalibrate. 3. Is the sensor damaged?
3	The weight of the equipment	1. Check whether the sensor circuit connection is correct and reliable, and whether the circuit is

	is abnormally fluctuating and unstable when it is stationary	rusty or oxidized. - Whether the weighing mechanism is affected by external forces or vibrations. - Is the sensor damaged? - Sensors or controllers are subject to interference from electrical equipment around the site, such as motors and frequency converters. 【 2.1.5 Filter 】 Whether the setting is appropriate.
4	Cannot start	- Whether the external start button and other input lines are properly connected to the controller (which can be checked through switch quantity testing). - Whether the input port definition for the startup signal access is correctly defined as startup.
5	The result of the reduction is inaccurate	- After the feeding is completed, the result displayed by the controller is inaccurate. - Adjust the Settings of the lead amounts for large, medium and small dosages in the recipe parameters. To ensure accuracy, it is necessary to guarantee that the small casting process has sufficient time. - Check whether the reduction mechanism is normal, whether the discharge port is blocked, and whether the material flow is smooth. - The result displayed by the controller is accurate, but the actual re-weighing result is

		inaccurate. (1) There is a deviation between the displayed weight and the actual weight, and calibration is required. (2) It is best to use weights or materials of the same weight as the target value for calibration. During calibration, pay attention to the uniform force on the scale platform and avoid uneven loading.
6	Cumulative inaccurate	The moment when the controller records the cumulative value is at the end of the fixed value process. Therefore, check whether the time setting of [4.3.2 Fixed value Hold] is sufficient. It is necessary to ensure that when the fixed value hold time ends, the weight displayed by the controller has stabilized and no longer fluctuates significantly. Only in this way can the accurate cumulative result of weight reduction be recorded.