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EASY PACKAGING

STEP SH3F-1-400 Single Bin Weighing Bagging Machine

OPERATING MANUAL

MANUAL-EN

CE

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Packing controller instruction manual

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)

Directory

I. Basic Information

1.1. Features and Specifications

Single-channel quantitative packaging controller instrument based on Chinese touch screen. It supports both hopper scale and without hopper scale working patterns. adopts high color TFT touch screen, which supports Chinese input and Chinese display. It has a beautiful graphical interface, reasonable functional classification and layout. All these excellent features make very easy to use.

STEP SH3F-1-400 packaging controller has the following basic features：

●Terminal TFT high color touch screen, input and display in Chinese and English.

●Weighing channel: single channel

●Working voltage：DC24V

●Sensor：DC5V/4-wire and 6-wire system compatible

●Switch quantity：7 input /12 output（4 in /3 out expansion board can be added)

●Installation method：cubicle outfit（Panel mounting）

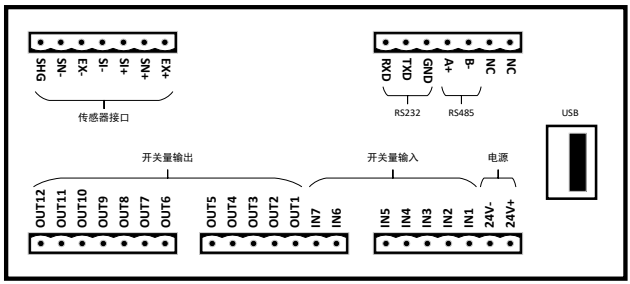
●Volume：203×149×50（Length * width * height，mm）

The detailed technical specifications are as follows：

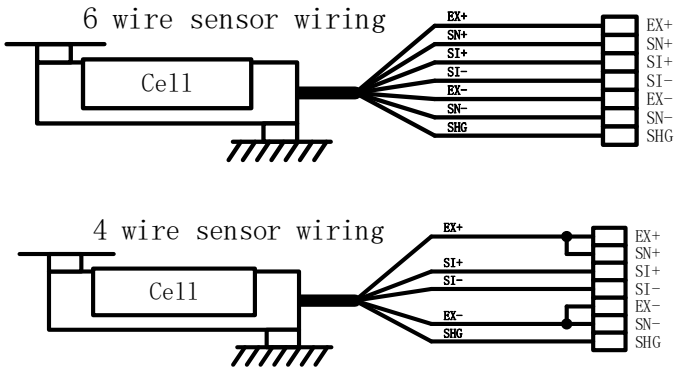
Transducer Excitation	DC5V±10%/120mA Drive current/can receive eight Ω 350 specifications of the sensor
Adaptive Sensor Sensitivity	2mV/V or 3mV/V
Input Signal Range	0～15mV
Minimum Input Sensitivity	0.5uV/d
Nonlinearity	0.02%FS（3mV/V hour）
Zero Drift	＜0.5μV/℃
Gain Drifting	＜10PPM/℃
AD Rate	960Times/Seconds
Maximum Accuracy of Display	1/100000
Product Accuracy Grade	Ⅲ
Working Voltage	DC24V（18V～30V compatibility）
Product Power Consumption	＜5W
Operating Temperature Range	-10℃~45℃
Storage Temperature	-20℃~60℃
Humidity	Within 90%RH（No Condensation）

1.2. **Connection Port**

The connection Port is shown：



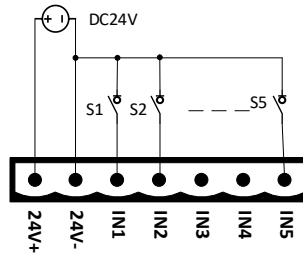
1.3. Sensor wiring method



1.4. IO wiring and definition

1.4.1. Schematic diagram of IO

For example, IN1, IN2, and IN5 are shown as follows:

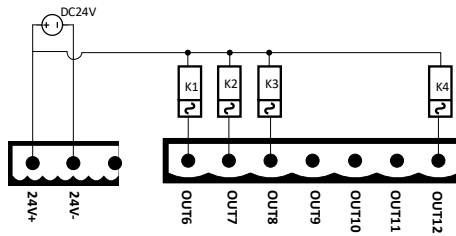


The external circuit drive input switching quantity should meet two points, as follows:

1. The external circuit must be co-located with the controller；

2. When the input power of the external circuit is low, the input is valid; otherwise, the input is invalid.

The wiring diagram of the output switch quantity is as follows (OUT6, OUT7, OUT8, and OUT12 are used as examples) :



The external circuit driven by output switching quantity should meet two main points:

1. The external circuit should be co-located with the controller;

2.Low level when switching quantity output is active.

Note: the maximum driving capacity of each switch output is 500mA. Please pay attention to the power of the load when connecting the load. If the power exceeds the driving capacity of the output, the switch output may be damaged.

1.4.2. Interface definition

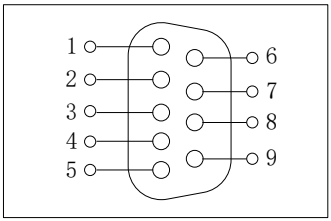
interface	instructions	interfa	instructions
24V+	DC24V +	24V-	DC24-
IO Input			
IN1	I1.start	IN2	I4.stop
IN3	I5. zeroing	IN4	I6. clear alarm
IN5	I3. slowly stop	IN6	I7.clip/release bag
IN7	I12.manual-disc		
IO Output			
OUT1	Q1.running	OUT2	Q2.stop
OUT3	Q3. large	OUT4	Q4.med
OUT5	Q5.slow	OUT6	Q6. Fixed value
OUT7	Q7. Ove/und	OUT8	Q8. warning
OUT9	Q9. clip Bag	OUT10	Q10.Pat/Push Bag
OUT11	Q11. disc	OUT12	Q12. zero
Sensor interface			
EX+	Load Cell Excitation+	EX-	Load Cell Excitation-
SN+	Load Cell Sense+	SN-	Load Cell Sense-
SI+	Load Cell Signal+	SI-	Load Cell Signal-
SHG	Load Cell Shielded Wire		

1.4.3. IO Expansion Board

The controller can be equipped with switch expansion board, the interface form is DB9 type plug, can provide additional 4 in and 3 out switch interface, the controller can automatically identify the expansion board, when connected to switch expansion board, switch related function interface will automatically display the increased

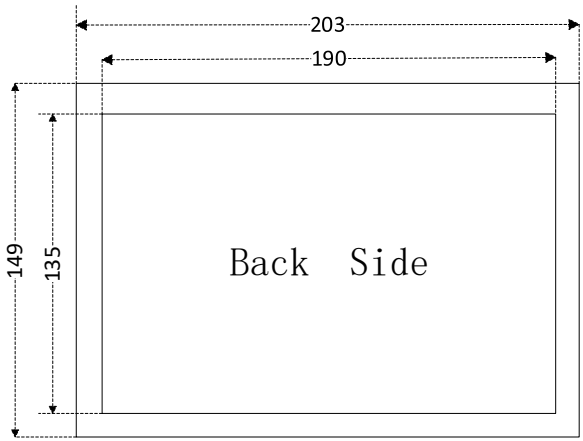
switch function definition.

The interface is defined as follows:



DB9 lead foot	Interface specification
NO.1 lead foot	IN8
NO.2 lead foot	IN9
NO.3 lead foot	IN10
NO.4 lead foot	IN11
NO.5 lead foot	OUT13
NO.6 lead foot	OUT14
NO.7 lead foot	OUT15
NO.8 lead foot	empty
NO.9 lead foot	empty

1.5. **Mounting Dimension**

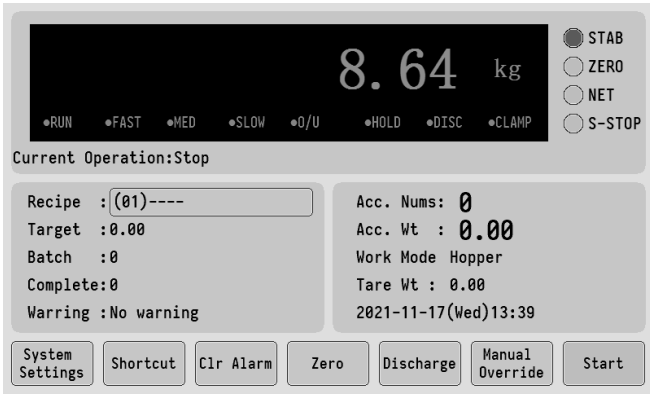


The image above is the bottom view of the product，data unit：mm

Recommended installation hole size：192mm×138mm

II. Main Interface

After the power start is completed, the main interface is entered, as shown in the figure below：



The top column shows the status indicators such as current weight value、weight stability、 zero、net and slow stop，and the detailed running steps of the controller.

The middle two columns show the following:

【recipe】The current Recipe number and Recipe name are displayed. Click to select the formula.

【target】That is the target packaging weight of the current Recipe used.

【Batch】The target requires the number of packages to be packed，The controller will stop automatically after completing the batch setting。

【complete】The number of packages completed this time.

【Acc Nums】Total number of packages completed by packaging.

【Acc-wt】Total weight of packing completed.

Note: Click the accumulated data display location to clear the accumulated data.

【Work Mode】The current working mode.

【Tare Wt】Tare value in the current packaging process.

At the bottom of the column is the function key, which can be used for some parameter setting and operation.

System maintenance：The system maintenance page is displayed.

Shortcut：The shortcut Settings screen is displayed.

Clr alarm：When there is an alarm, click the button to clear the alarm.

zero：Perform zero clearing for the current weight. When the button is gray, it means it is not available. For example, when running, it is gray.

Discharging： Click to turn on and off unloading signal.

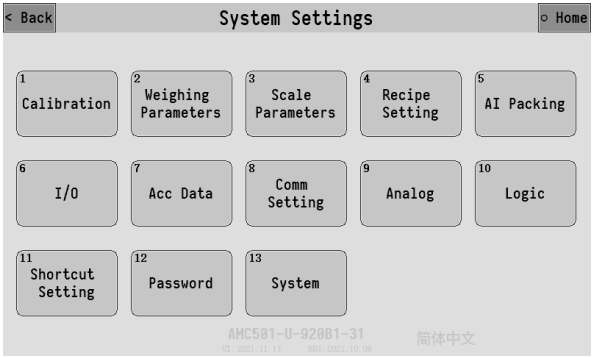
Manual Override：It can manual control the fast, moderate, slow feeding,clamp， and switch port real-time status display.

Start ：The gray color indicates the stop state，click on the Start，If no error is reported, the system will start the packaging workflow.

III. System maintenance

Click system maintenance in the main interface to enter the system maintenance interface，as shown in the figure below：

（Initial password for system maintenance：000000）



All controller parameters are listed on this screen.

The controller model and software date are displayed at the bottom of the screen. Click the English 和简体中文 buttons displayed in the lower right corner to switch between Chinese and English display.

The following is a detailed description of each major item in system maintenance.

3.1. Weight Calibration

New equipment needs to be calibrated for weight before use, And set up the system unit, accuracy, division value and capacity.

（1） There are three calibration methods of weight, choose one of them according to the actual situation:

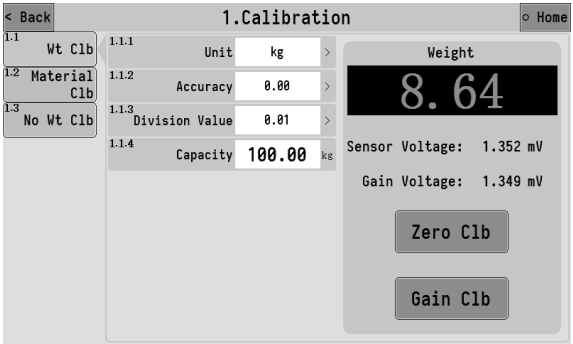
（2） Wt Clb：Calibrate using weights or objects of known weight on scale

table.

（3） Material Clb：Add the material directly to the weighing bag or weighing bucket, weigh the actual weight of the material after it is released to calibrate.

（4） No Wt Clb：Direct input zero voltage value, gain voltage value and the corresponding weight for calibration.

3.1.1. Weight Calibration



The absolute voltage shown in the right column refers to the current sensor voltage value. The normal range of this value is 0 to 15mV. If the value exceeds this range, it indicates that the signal of the weight sensor is abnormal. Check whether the sensor is damaged or whether the cable connection is normal and reliable.

Relative voltage refers to the difference between the current absolute voltage minus the voltage value at zero calibration, which is equivalent to the voltage value generated by the gain weight. The calibration process only requires zero calibration and gain calibration. The operations are as follows:

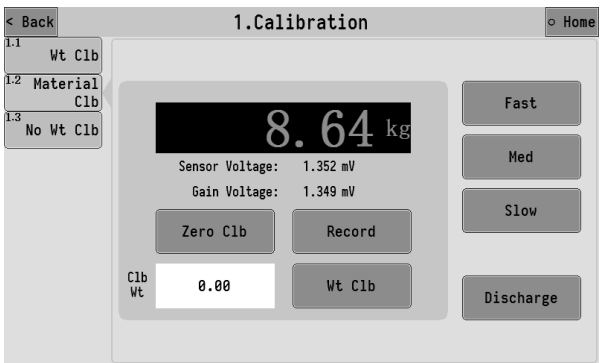
（1） Empty the weighing platform and click zero Clb after the signal is stable (absolute voltage does not jump), if success, there is a

successful indication of zero calibration.

（2） Put the weight or the object with known weight on the weighing platform, and click Gain Clb after the signal is stable (the absolute voltage does not jump), At this point, the input box pops up, input the exact weight of the object and click "confirm". When successful, there will be a prompt indicating the success of calibration gain.

After the completion of the above two steps, the weight calibration process is completed. The controller will display the accurate weight value on the weighing platform.

3.1.2. Material calibration



Material calibration can be directly added to the weighing bag or weighing bucket, weighing the actual weight of the material after release for calibration. The operation is as follows:

（1） Empty the weighing platform, click Zero Clb after the signal is stable (absolute voltage does not jump), and there will be a successful reminder of Zero calibration.

（2） Bucket scale:

Click Fast、Med、Slow to manually open and close the

corresponding feeding device and add a certain amount of material to the weighing bucket. After the signal is stable (absolute voltage does not jump), click Record to record the weight signal at this time.

No hopper scale:

Clip the packaging bag, and then click Fast、Med、Slow to manually open and close the corresponding feeding device to add a certain amount of materials to the packaging bag. fter the signal is stable (absolute voltage does not jump), click Record to Record the weight signal at this time.

（3） Bucket scale:

Clamp the bag, click Discharge to place the material in the weighing bucket into the bag, remove the bagput it on the accurate scale to weigh the weight of the packaging bag to get the accurate weight value (note that the weight of the packaging bag is not included), click the input box of "Weighing weight", input the actual weight of the material obtained by weighing,click Wt Clb to complete the material calibration process.

No hopper scale:

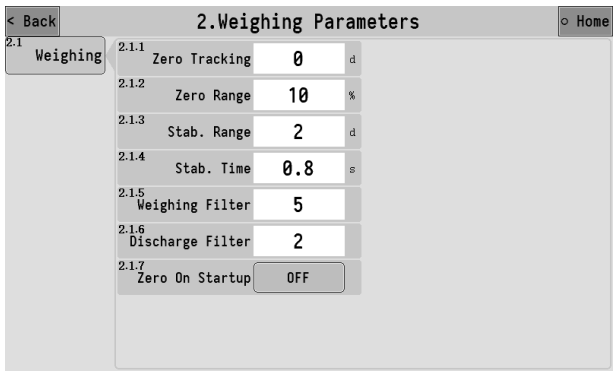
Take off the bag and put it on an accurate scale to weigh the weight of the bag, and click the input box of 【Weighing weight】. After input the actual weight of the bag, click Wt Clb to complete the material calibration process.Wt Clb to complete the material calibration process.

3.1.3. Calibration Without Weights

On this interface, you can enter separately Zero Voltage、Gain Voltage and Gain Weight， click Calib can complete the calibration process without weight.

3.2. Weighing Parameters

Click the 2.Weighing parameters button in the system maintenance interface to enter the setting interface of basic weighing parameters,the interface is as follows:



2.1.1	Zero Tracking	0~9d Only in the stop state, the weight value is stable in the set value × D (minimum indexing value) within the positive and negative range of automatic zeroing.	
2.1.2	Zero Range	0~99% The weight must be less than or equal to Maximum measuring range x Clearing range.	
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 "stabilization time", and the difference between the maximum value and the minimum value is ≤"Stable range", the weight value is considered stable at this time.
2.1.4	Stab. Time	0.1~9.9s	
2.1.5	Weighing Filter	0~9 The intensity level of software digital filter, according to the actual debugging effect of equipment to set the appropriate filter level parameter value. 0: the filtering effect is the weakest, the weight response is fast, and the	

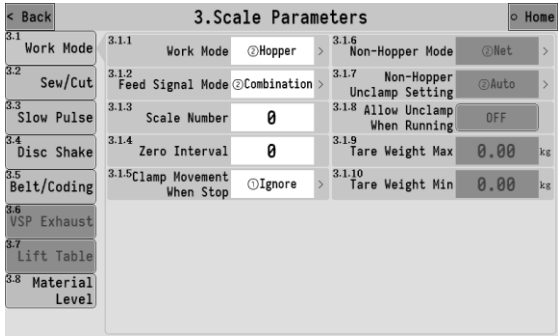
		anti-vibration effect is poor; 9：The filtering effect is the strongest, the weight response is slow, and the anti-vibration effect is good.
2.1.6	Discharge Filter	0~9 Software digital filter intensity level in unloading state.
2.1.7	Zero On Startup	After it is turned on, the controller will automatically perform a zeroing operation every time it is powered on and powered on.

3.3. Scale Parameters

Click the button 3.Scale Parameters,in the system maintenance interface to enter the setting interface of packaging scale parameters, prameters are divided into several categories according to function and control flow.

3.3.1. Work Mode

Function parameters related to working mode of packing scale can be set.



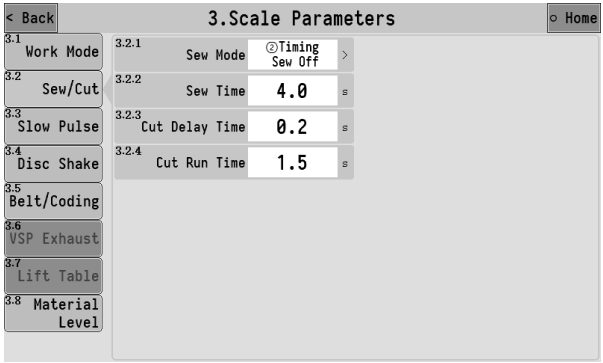
3.1.1	Work Mode	② [without hopper mode] ③ [hopper mode] ④ [Valve port scale model] ⑤ [Superfine powder without bucket] ⑥ [No bucket bottom charging] ⑦ [No bucket Exh] The corresponding workflow of different working modes is described in Chapter. Ⅳ Work Process and Function Description
3.1.2	Feed Signal Mode	①[independent feeding]: Fast: effective output of large input signal. Med speed: med signal output is valid. Slow speed: the output of slow signal is effective. ②[combined feeding]: Fast: fast, med and slow signal output is effective. Med speed: med and slow signal output is effective. Slow speed: the output of smlow signal is effective.
3.1.3	Scale Number	0~7 Used for setting the priority of multi-scale package.

3.1.4	Zero Interval	0~99 After each several packaging processes, before the start of the feeding process to zero. Note: the first scale after starting will not be cleared.
3.1.5	Clamp Movement When Stop	Used to set the processing mode of bagging mechanism after the equipment is turned to stop state: ①[ignore]：Do not control the action of bag clamping mechanism after stopping, and keep the state before stopping. ②[unclamp]：After stopping, make the bag clamping mechanism in loose bag state. ③ [clamp] ： After stopping, the clamping bag mechanism is in the clamping bag state. Note: This function does not work in port scale mode.
3.1.6	Non-Hopper Mode	This function is available in the relative working mode of the bucket scale. ① [gross weight packaging] : do not peel before adding. ②[net weight packaging] : pre-packaging.
3.1.7	Non-Hopper Unclamp Setting	This function is effective in the bucket scale, bucket - less superfine powder and bucket - less Exh mode. ①[manual loosening] : automatically loosening the bag after finishing the packaging. ②[automatic bag loosening] : After the packaging is completed, manually input "I7 clip/bag loosening" signal to loosen the bag.
3.1.8	Allow Unclamp When Running	Sets whether bagging is allowed at run time. [opened] ： When running, input bagging signal

		controller will perform bagging action and return to waiting bagging state. [closed]： Does not respond to loose bag signal at run time. **Note: This feature only works in bucket scale mode.**
3.1.9	Tare Weight Max	Tare weight detection function. No bucket scale mode, and set to net weight packaging, after running the bag, the controller before peeling detection "lower tare weight ≤ current weight ≤ upper tare weight", the tare weight is considered normal, peeling can start feeding ,Otherwise, "Abnormal tare weight" will be displayed for manual handling. The tare detection function is disabled when the upper and lower tare weights are set to 0. **Note: This feature only works in bucket scale mode.**
3.1.10	Tare Weight Min	

3.3.2. Sew/Cut

The controller has the function of sewing and cutting control, and can control the sewing and cutting action of the sewing machine. The related functional parameters are as follows:

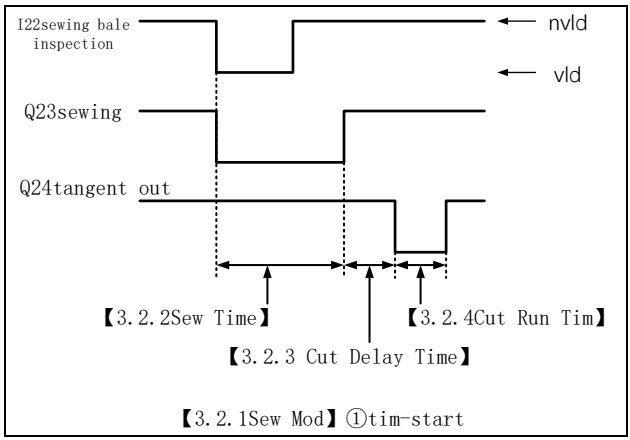


3.2.1	Sew Mode	[Start time]：When the input of "I22 sewing bag detection" signal is valid, "Q23 Sewing bag output" signal is output and started 【3.2.2 Sewing bag End delay】. When the delay time reaches, "Q23 Sewing bag output" signal is closed. [Timing Sew Off]： When "I22 Stitch Detection" signal is valid, "Q23 Stitch Output" signal will be output. When "I22 Stitch Detection" signal is invalid, it will be started 【3.2.2 Stitch End delay】, and the "Q23 Stitch Output" signal will be closed when the delay time expires. **For details, see section**Error! Reference source not found..
3.2.2	Sew Time	0.0~99.9s After this delay, the sewing signal output is invalid.
3.2.3	Cut Delay Time	0.0~99.9s Start the delay when the sewing ends, and output "Q24 tangential output" signal after the delay.
3.2.4	Cut Run Time	Output time of "Q24 Tangential Output" signal. **If there is a defined "I21 tangent in place" signal,**

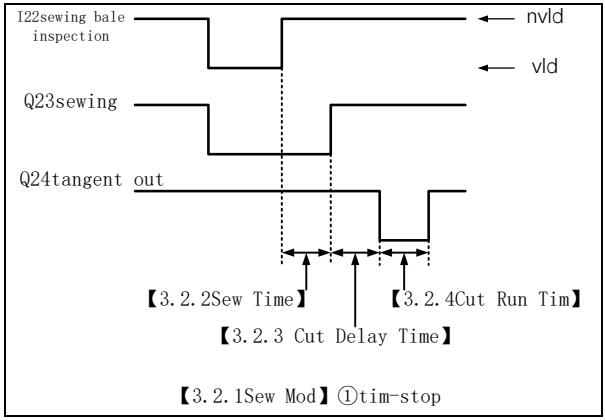
		the tangent will be terminated immediately if the "I21 tangent in place" signal is detected when the tangent output is valid.

3.3.2.1. Sew function description

1. 【3.2.1 Timing mode of sewing bag】 Set to ①[timing at the beginning], and the signal sequence diagram of the sewing bag tangency function is as follows:

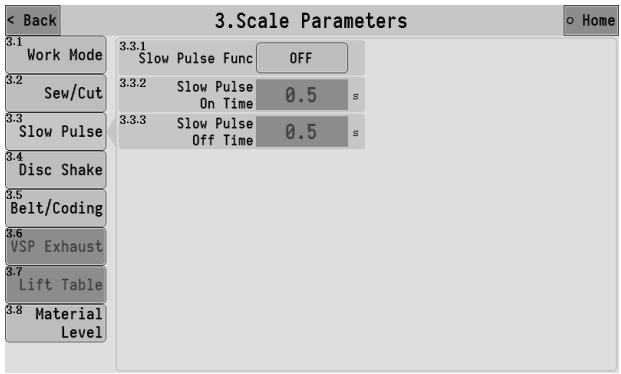


2. 【3.2.1 Timing mode of sewing bag】 Set to ②[timing at the end], and the signal sequence diagram of the sewing bag tangency function is as follows:



3.3.3. Slow Pulse

The function of small feeding can control the output signal of small feeding in the form of pulse feeding.

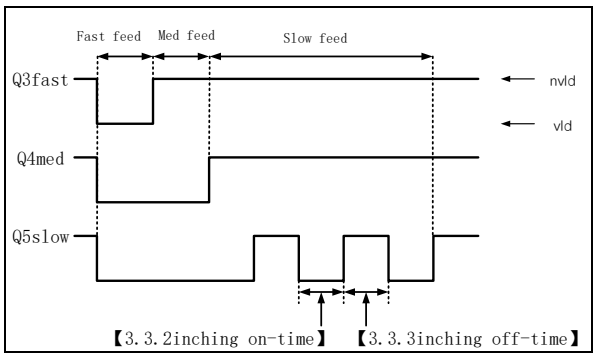


3.3.1	Slow Pulse Func	① [ON]："Q5 small throw" signal will be output in the form of pulse dot. ② [OFF]："Q5 small input" signal will be output in normal level form. **Note: the slow feed action function only works in**

		the slow feeding process (only when the slow feed signal is output).
3.3.2	Slow Pulse On Time	0.0~99.9s The effective time of the output pulse dotting.
3.3.3	Slow Pulse Off Time	0.0~99.9s The invalid time of output pulse dotting.

3.3.3.1. Detailed description of slow drop point function

The function of small point feeding only plays a role in the process of slow feeding. The following figure shows the output sequence of feeding signal when parameter 【3.1.2 Feeding signal output mode】 is set to ②[combined feeding].



3.3.4. Disc Shake

Discharging shaking function works in bucket scale mode.

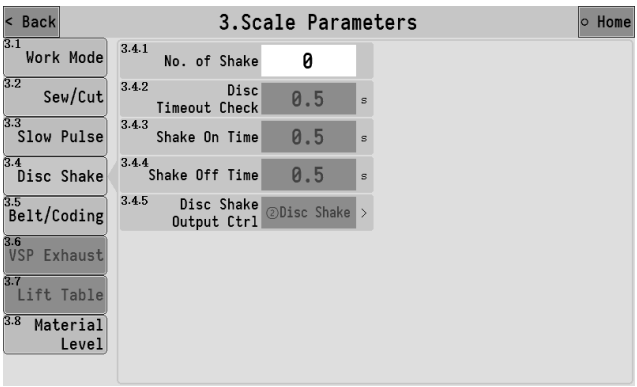
When there is a bucket scale packaging fluidity is not very good or a certain viscosity of the material, there may be sticky material in

unloading, resulting in some materials can not be released normally weighing hopper.

The unloading vibration function can detect when the unloading timeout situation, output the corresponding vibration signal to control the vibrator or air hammer and other devices, vibration on the weighing bucket, so as to achieve the purpose of falling the material adhesion on the weighing bucket.

Setting 【3.4.5 Unloading Vibration output selection】 as ①[unloading] can also realize the function of vibration falling of materials adhered to the weighing hopper by directly controlling the opening and closing of the unloading door when discharging timeout occurs.

Parameters related to the unloading vibration function are set as follows:

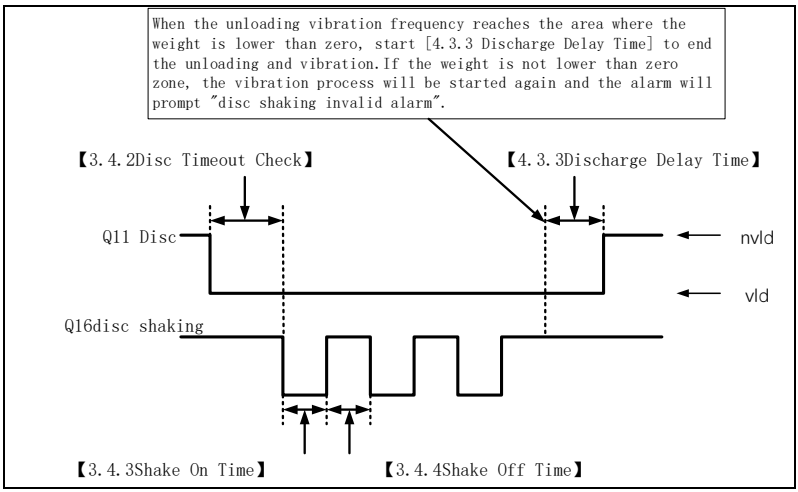


3.4.1	No. of Shake	0~99 Number of discharging vibration signal output. If the current weight is lower than 【4.2.5 Discharging Zero zone value】 after the number of discharging vibration is reached, the vibration will

		be terminated, and the unloading will be terminated after 【4.3.3 discharging delay time】 is started. If the current weight is not lower than 【4.2.5 Discharging zero zone value】after the number of discharging vibration is reached, the alarm will be "invalid alarm of discharging vibration", and the next vibration cycle will continue to open. **When the unloading vibration frequency is set to 0, the unloading vibration function is disabled.**
3.4.2	Disc Timeout Check	0.0~99.9s Open this time at the beginning of unloading. If the unloading is not completed after this time (the weight is not lower than 【4.2.5 unloading zero zone value】), the unloading is considered timeout and the unloading vibration output is started.
3.4.3	Shake On Time	0.0~99.9s Effective output time of discharging vibration signal.
3.4.4	Shake Off Time	0.0~99.9s Invalid output time of discharging vibration signal.
3.4.5	Disc Shake Output Ctrl	①[Unloading] : Direct control of "Q11 unloading" signal when unloading vibration, through the control of unloading door switch to vibrate the material. ②[unloading vibration] : output "Q16 unloading vibration" signal when unloading vibration, through the control of vibrator or air hammer and other devices to vibrate the material.

3.3.4.1. Detailed description of discharging vibration function

The timing diagram of discharging vibration function signal is shown as follows:

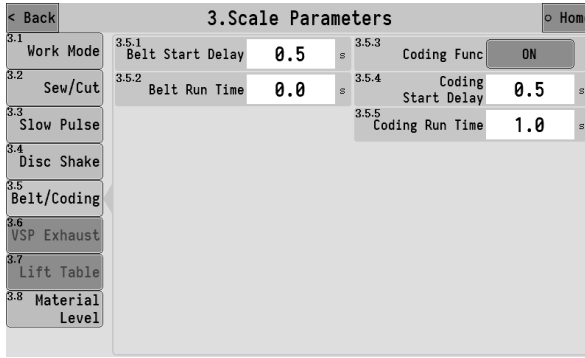


3.3.5. Belt/coding

Belt function: the conveyor belt in the equipment can be controlled to start and stop, used to transport the material bag after packaging.

Coding function: used to control the coding machine, after the completion of clamping bag output coding control signal to control the coding machine to print the code on the bag.

Related parameters are as follows:



3.5.1	Belt Start Delay	0.0~99.9s Start belt conveyor delay time, loose bag after starting this time, time to output "Q18 belt" signal control conveyor belt rotation.
3.5.2	Belt Run Time	0.0~99.9s Duration after output of "Q18 belt" signal. **Note: when the time is set to 0, the "Q18 belt" signal will be output effective after the instrument runs, so that the belt keeps rotating.**
3.5.3	Coding Func	Switch of coding function.
3.5.4	Coding Start Delay	0.0~99.9s When the bag is clamped, this delay is activated, and when the delay time is up, "Q35 coding function" signal is output to control coding by the coder.
3. 5. 5	Coding Run Time	0.0~99.9s Duration of “Q35 Coding function ”signal output

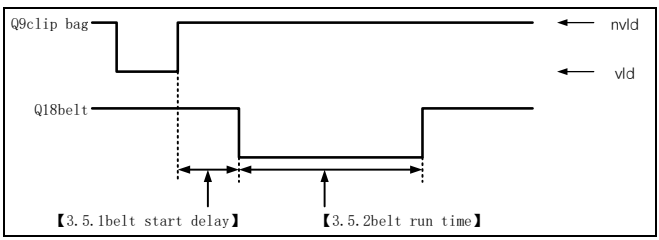
3.3.5.1. Detailed description of belt functions

Belt control function can be divided into two modes according to the setting of parameter 【3.5.2 belt running time】 :

1. Single conveying mode (【3.5.2 belt running time】 is not set to 0)

When running in this mode, when the bag is loose, start 【3.5.1 belt start delay】, output "Q18 belt" signal to control the conveyor belt rotation after the delay time, and close "Q18 belt" signal output after 【3.5.2 belt running time】.

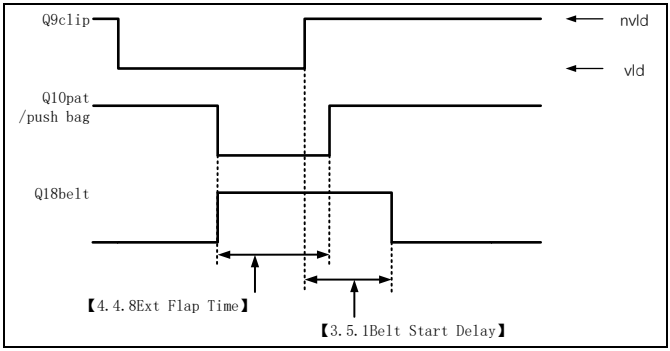
Signal timing is as follows:



2. Continuous operation mode (【3.5.2 belt running time】 is set to 0)

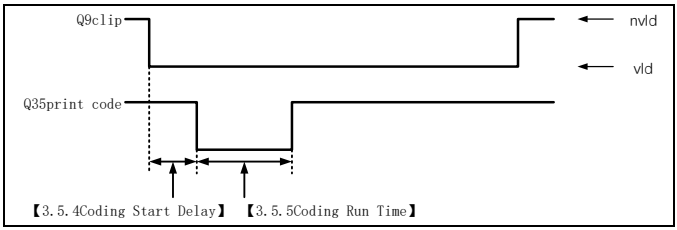
When running in this mode, the "Q18 belt" signal is always valid. Only when the patting bag function is enabled, the "Q10 patting bag" signal is output and the 【4.4.8 Extra patting bag time】 is executed, the "Q18 belt" signal will be closed, Loose bag after start 【3.5.1 belt start off delay】, after the delay time continues to output "Q18 belt" signal to control conveyor belt rotation.

Signal timing is as follows:



3.3.5.2. Coding function details

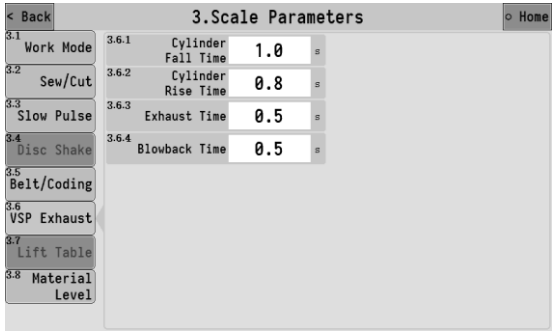
Each time the bag is clamped, the coding function is started, and the "Q35 coding function" signal is output to control the coding of the coding machine. The signal sequence diagram of the coding function is as follows:



3.3.6. VSP Exhaust

It works when 【3.1.1work mode】 set to ④[Superfine powder without bucket]or⑥[No bucket Exh], ued in packing ultrafine powder materials need to be pumped on the equipment, can control the lifting of the exhaust rod cylinder, pumping and reverse blowing and other actions.

Related parameters are as follows:



3.6.1	Cylinder Fall Time	0.0~9.9s The time when the suction rod cylinder falls.
3.6.2	Cylinder Rise Time	0.0~9.9s The time for the rod cylinder to rise.
3.6.3	Exhaust Time	0.0~9.9s Duration of pumping action.
3.6.4	Blowback Time	0.0~9.9s Duration of blowback action.

3.3.6.1. Details on pumping function of superfine powder

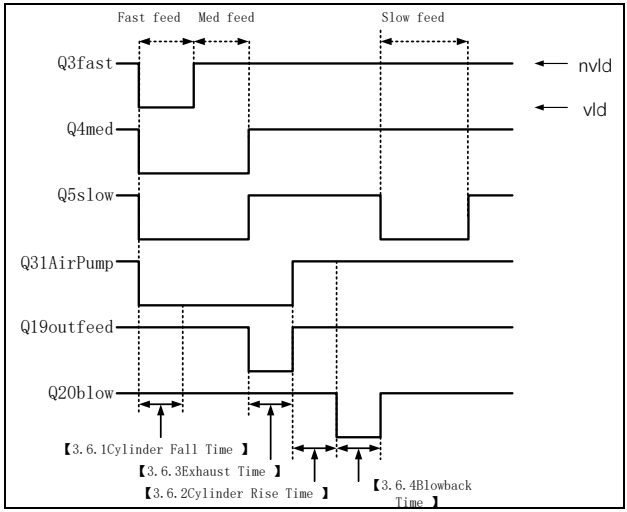
The following is an example of the working mode of superfine powder without bucket to explain the pumping action process in detail:

1. eration, at the beginning of fast feeding (fast, med and slow input output effective), start 【3.6.1 Cylinder falling time】 timing, and output "Q31 cylinder lifting" signal at the same time to control the suction rod cylinder falling,

and pump the suction rod deep into the packaging bag. 【3.6.1 Cylinder falling time】 It is considered that the cylinder falling is completed.

2. When the medium-speed feeding ends (med ends), stop feeding, start 【3.6.3 Pumping time】 timing, and output "Q19 pumping" signal at the same time to control the pumping rod. When 【3.6.3 Pumping time】 expires, close "Q19 pumping" signal to end the pumping action.
3. Start 【3.6.2 cylinder lifting time】and close "Q31 cylinder lifting" signal at the same time to control the lifting of the exhaust rod cylinder. 【3.6.2 cylinder lifting time】It is considered that the cylinder lifting is completed.
4. Start 【3.6.4 blowback Time】 timing, and output "Q20 blowback" signal at the same time to control the suction rod blowback. When 【3.6.4 blowback time】 expires, close "Q20 blowback" signal to end the blowback action.
5. Start slow feeding (slow feeding output effective), continue to finish feeding materials.

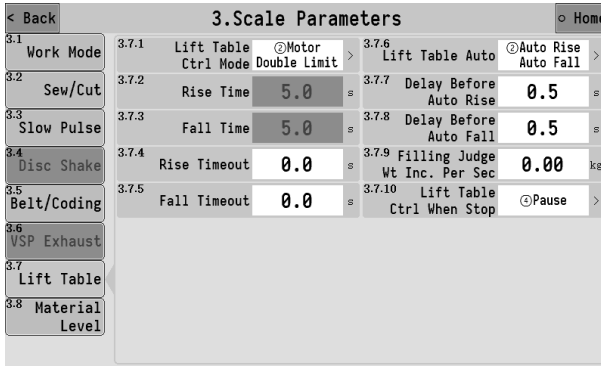
The timing diagram of pumping energy of ultrafine powder is as follows:



3.3.7. Lift Table

When 【3.1.1Work Mode】 set to ⑤[No bucket bottom charging]，this function takes effect. Multi-purpose in the need to insert the feeding mouth into the bottom of the packaging bag for feeding equipment, before the start of feeding the bag bracket will be raised, The feeding port is inserted into the bottom of the bag, and the clamping bracket is lowered slowly during feeding.

Related parameters are as follows:



3.7.1	Lift Table Ctrl Mode	③ [Pneumatic - infinite bit] ④ [Moter Double Limit] ⑤ [Pneumatic - double limit] See section **Error! Reference source not found.** for detailed description of the function flow.
3.7.2	Rise Time	0.0~99.9s It works when【3.7.1 Support lifting control mode】set to ①[Pneumatic - infinite bit]. The support is considered to be completed after this time.
3.7.3	Fall Time	0.0~99.9s It works when【3.7.1 Support lifting control mode】set to ①[Pneumatic - infinite bit]. The stent descent is considered complete after this time.
3.7.4	Rise Timeout	0.0~99.9s It works when【3.7.1 Support lifting control mode】set to ②[Electric - double limit] or ③[Pneumatic - double limit]. "Upper limit of I30 bracket" is not effective after

		this time when the bracket is being raised, and the alarm will be raised "bracket rising timeout". If the rise timeout is set to 0, the rise timeout detection and alarm functions are disabled.
3.7.5	Fall timeout	0.0~99.9s It works when【3.7.1 Support lifting control mode】set to②[Electric - double limit] or [Pneumatic - double limit]. If "I31 lower limit of stent" is not effective after this time, "stent descent timeout" will be reported. If drop timeout is set to 0, drop timeout detection and alarm are disabled.
3.7.6	Lift Table Auto	①[OFF]： After the bag clamping is completed, the signal of "I29 up/down bracket" shall be manually given to start rising, and the signal of "I29 up/down bracket" shall be manually given to start falling after the feeding. ① [Auto Rise Auto Fall]：When the clamping bag is completed, the bracket automatically rises, and when the feeding begins, the bracket automatically drops. ② [Automatic rise manual fall]：After the bag clamping is completed, the bracket will rise automatically. After feeding, the signal of "I29 up/down bracket" should be manually given to start to fall. ③ [Manual up automatic down]：After the completion of the clamping bag, it is necessary to manually give the bracket rise

		signal, and the bracket will drop automatically after feeding.
3.7.7	Dalay Before Auto Rise	0.0~99.9s Delay time before the support automatically rises.
3.7.8	Dalay Before Auto Fall	0.0~99.9s Delay time before bracket automatic descent.
3.7.9	Filling Judge Wt Inc Per Sec	Set the parameter to weight gain per second to determine whether the fuel is being added. If the bracket is set to drop automatically and this parameter is not set to 0, the meter will determine if the weight gain per second is greater than this parameter after feeding begins. If it is greater than this parameter, it is considered to be feeding, and the support starts to drop automatically; If less than this parameter, it is considered that there is no feeding (possibly lack of material), and the stent descent is suspended until normal weight increase is detected and the stent begins to descend again. **When the value is set to 0, the feeding judgment function is disabled.**
3.7.10	Lift Table Ctrl When Stop	① [No control] : the action of the bracket mechanism is not controlled after the stop, and the state before the stop is maintained. ②[down] : The support is in a descending state after stopping. ③[rising] : The support is in the rising state after stopping. ④ [pause] : Suspend the support action after stopping

3.3.7.1. Detailed description of support lifting function

According to the setting of 【3.7.1 Support control Mode】, the support lifting process is mainly in the following three ways:

① [pneumatic-infinite bit] : the lifting of the bracket is controlled by pneumatic signal.

The signal output of "Q31. Cylinder lifting" is effective when rising, and the support is controlled to rise. After 【3.7.2 rising time】, the support is considered to have finished rising.

During descent, the signal output of "Q31 cylinder lifting" is invalid and the control bracket descends. After 【3.7.3 descent time】, it is considered that the bracket descends completely.

②[electric-double limit] : the lifting of the bracket is controlled by electric signal, and the upper and lower limit signals are input to the instrument to determine whether the bracket rises and falls in place.

When rising, the signal output of "Q33 bracket rising (electric)" is effective, and the control bracket is rising. When the signal of "I30 bracket upper limit" is detected, it is considered that the rise is finished, and the signal output of "Q33 bracket rising (electric)" is closed.

When descending, the signal output of "Q34 bracket descending (electric)" is effective, and the control bracket descending is effective. When the signal of "I31 bracket lower limit" is detected, it is considered that the descending is completed, and the signal output of "Q34 bracket descending (electric)" is closed.

③[pneumatic-double limit] : the lift of the bracket is controlled by pneumatic signal. And the need for upper and lower limit signal

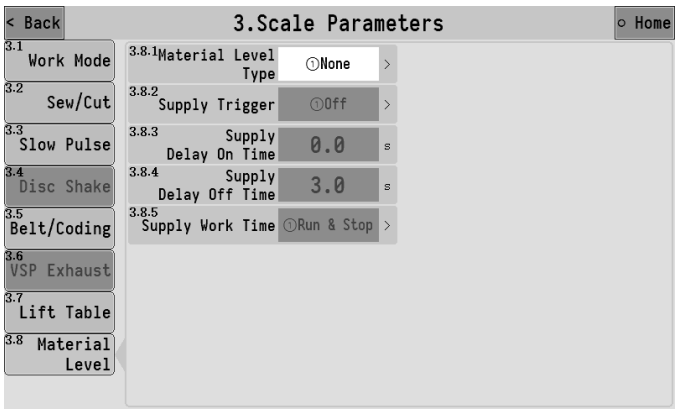
input to the instrument, used to judge whether the bracket is up, down in place.

The signal output of "Q31. Cylinder lifting" is effective when rising, and the control bracket is rising. If the signal of "I30 bracket upper limit" is detected, it is considered that the rising is finished.

During descent, the output of "Q31 cylinder lifting" signal is invalid, and the control bracket drops. If the signal of "I31 lower limit of support" is detected, it is considered that the descent is effectively completed.

3.3.8. Material level setting

Set the function parameters of signal input and feed output of feeder.



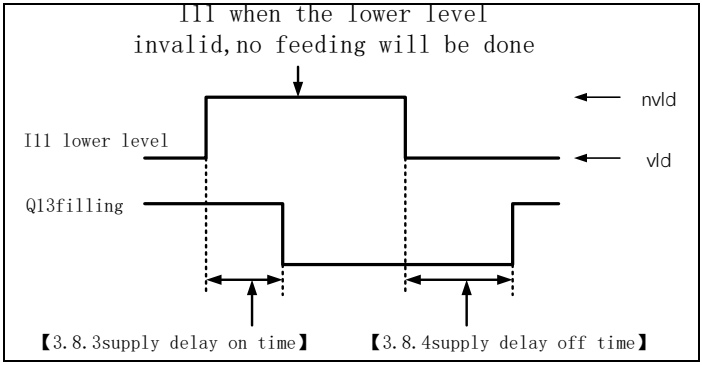
3.8.1	Material Level Type	① [no material level device] : no material level device. ② [single feeding level] : there is 1 feeding level device (feeding level). ③ [material level] : there are two material level device (feeding level, feeding level).

		④ [single feeding level] : there is a material level device (feeding level). **Note: if the mode with blanking level is selected, feeding will not start if the blanking level signal input is invalid.**
3.8.2	Supply Trigger	① [OFF]：Turn off the feed output function. ② [blanking level trigger] : "I11 blanking level" signal input invalid trigger feeding function. ③ [feeding level trigger] : "I9 feeding level" input invalid trigger feeding function. **Note: when the material level mode is set to [up and down material level], the feed output will continue until the feeding level signal is effective.**
3.8.3	Supply Delay On Time	After the feeding function is triggered, delay this time and output "Q13 feeding" signal.
3.8.4	Supply Delay Off Time	After feeding, delay this time and then turn off "Q13 feeding" signal output.
3.8.5	Supply Work Time	① [Run & Stop]。 ② [Run]。

3.3.8.1. Detailed Description Of Filling

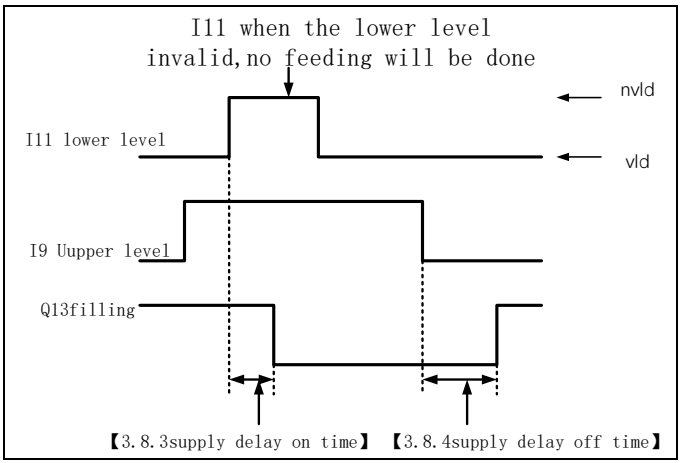
1. Material level mode: single feeding level; Feeding trigger: feeding level trigger.

   The sequence diagram is as follows:



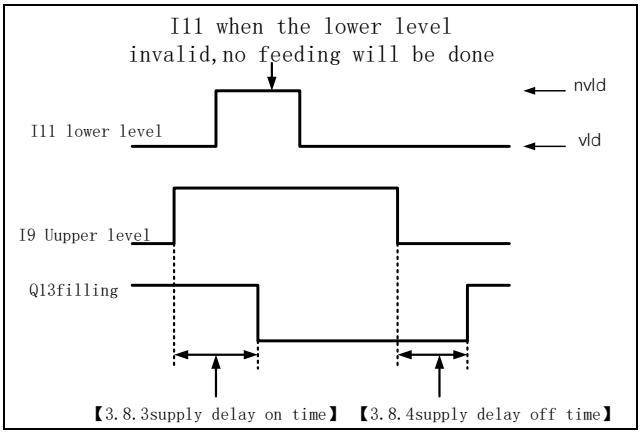
2. Material level mode: up and down material level; Feeding trigger: feeding level trigger.

   The sequence diagram is as follows:



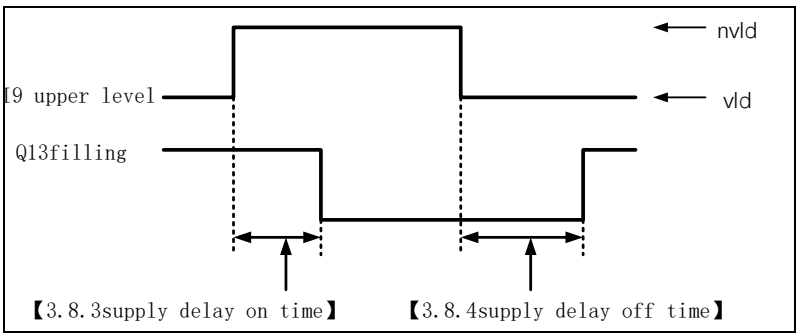
3. Material level mode: up and down material level; Feeding trigger: feeding level trigger.

   The sequence diagram is as follows:



4. Material level mode: single feeding level; Feeding trigger: feeding level trigger.

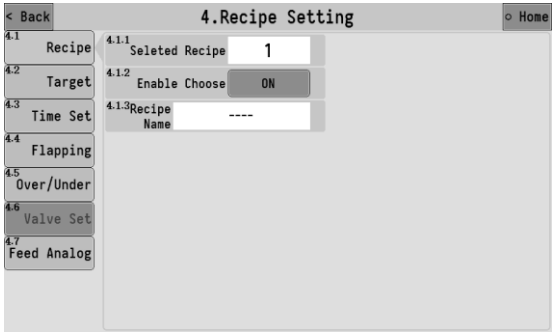
   The sequence diagram is as follows:



3.4. Recipe parameters

The controller has 20 groups of formula parameters for setting. Users can set common formula parameters in advance and switch to the corresponding formula when using.

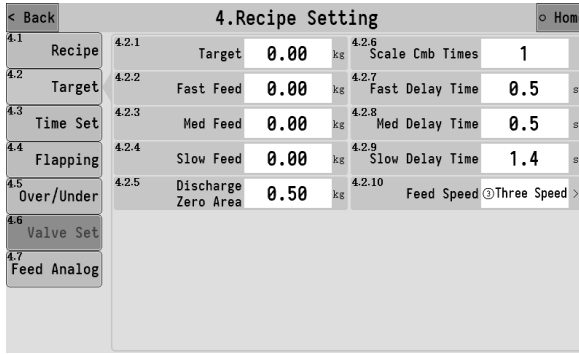
3.4.1. Recipe



4.1.1	Selected Recipe	Sets the current recipe number.
4.1.2	Enable Choose	After this function is enabled, the formula will be in optional state when the formula number is selected by clicking the position of the formula number on the main interface.
4.1.3	Recipe Name	You can enter the formula name for easy memorization. After setting, the corresponding formula name will be displayed in the formula number position on the main interface.

3.4.2. Target Value

This interface sets the formula parameters such as the target value of the formula number.



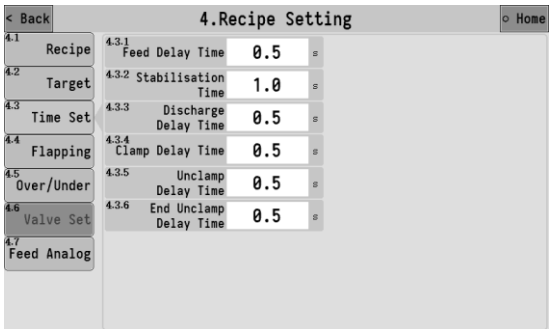
4.2.1	Target	Sets the target weight for packaging to achieve.
4.2.2	Fast Feed	When the weight value≥ target -fast feed, close the fast feeding; **If the value is set to 0, the fast output process is not started.**
4.2.3	Med Feed	When the weight value≥ target -med feed, close the mod feeding； **If the value is set to 0, the med output process is not started.**
4.2.4	Slow Feed	When the weight value ≥target value -fine feed, close slow feeding；
4.2.5	Discharge Zero Area	When 【3.1.1 work mode】set to②[scale] it works. When the bucket scale is discharging, when the current weight is less than or equal to the zero zone value of discharging, the unloading is considered to have been completed and the unloading door is ready to be closed.

4.2.6	Scale Cmb Times	When【3.1.1 work mode】set to ②[scale]it works. Set the number of times to discharge in a bag, that is, discharge several times to loosen a bag. **When the value is set to 0, the material can be discharged directly without judging whether to clip the bag after feeding.**
4.2.7	Fast Delay Time	0.0~99.9s The vibration elimination time at the beginning of the fast, During this time, the signal of fast casting is always effective and is not affected by weight, At the end of this time, it is judged whether the weight has reached the advance amount of the fast casting to end the large casting.
4.2.8	Med Delay Time	0.0~99.9s Vibration elimination time at the beginning of med. During this time, med signal is always effective and not affected by weight. After the end of this time, it will judge whether the weight has reached the advance amount of med and end med.
4.2.9	Slow Delay Time	0.0~99.9s The elimination of vibration time at the beginning of the slow,in this time, the slow signal has been effective and is not affected by weight. At the end of this time, judge whether the weight reaches the slow drop

		value to end the slow t.
4.2.10	Feed Speed	① [Two material speed (size)] : large and small feeding to achieve two material speed. ② [Two material speed (medium and small)] : medium and small casting realize two material speed feeding. ③ [three material speed] : large, medium and small casting to achieve three material speed feeding.

3.4.3. Time Set

Set related time parameters in the feeding process.



4.3.1	Feed Delay Time	0.0~99.9s Delay time before feeding begins.
4.3.2	Stabilisation Time	0.0~99.9s The waiting time after feeding is completed, and the feeding result of current weight record is obtained after this time.
4.3.3	Discharge Delay Time	0.0~99.9s It works when 【3.1.1 Work Mode】 set

		to②[with bucket scale] When the bucket scale is discharging, when the current weight is detected ≤ 【4.2.5 discharging zero zone value】, the discharging is considered to have been completed, and the discharging delay time is started, and the discharging door is closed when the time is up.
4.3.4	Clamp Delay Time	0.0~99.9s 【Q9 bag clamping】After the signal output is effective, the clamping bag action is considered to be completed after the delay of this time, and the subsequent process can be started, such as feeding (no bucket scale) or unloading (with bucket scale), etc.
4.3.5	Unclamp Delay Time	0.0~99.9s Delay time before automatic unclamp.
4.3.6	End Unclamp Time	0.0~99.9s After the bagging action is completed, the delay time will not respond to the 【I7 Clamp/Unclamp】 input signal within the delay time.

3.4.4. Flapping

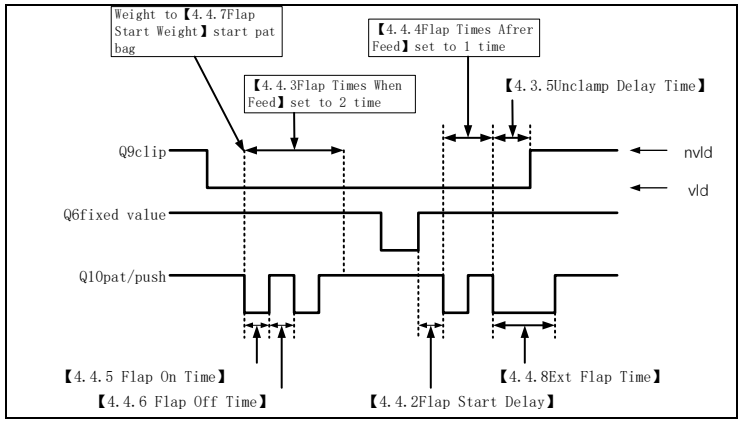
Set the function related to flapping action.

4.4.1	Flap Mode	① [OFF]：Closed Flap ② [Feeding]：Flap only during feeding。 ③ [After constant value]：Flap only after setting the value. ④ [All]：Flap after feeding and setting.
4.4.2	Flap Start Delay	0.0~99.9s Set the delay time before the backslap bag function starts.
4.4.3	Flap Times When Feed	0~99 Number of patting bag signal pulse output by patting bag function in feeding.
4.4.4	Flap Times Afrer Feed	0~99 Set the number of patting bag signal pulse output by the patting bag function.
4.4.5	Flap On Time	0.0~99.9s Effective time of pulse signal output by tapping bag.
4.4.6	Flap Off Time	0.0~99.9s Invalid time of pulse signal output by tapping bag.

4.4.7	Flap Start Weight	In the process of feeding, when the current weight is greater than the initial weight of the feeding bag, the feeding bag function will be started.
4.4.8	Ext Flap Time	0.0~99.9s After finishing the patting times after setting the value, additional output patting signal time will be started at the same time as [4.3.5 delay before releasing the bag], which is often used in the pier bag function. Set this time longer than [4.3.5 delay before releasing the bag] to realize that after putting the bag down, the bag will be loosened first and then the bag clamping mechanism will be lifted.

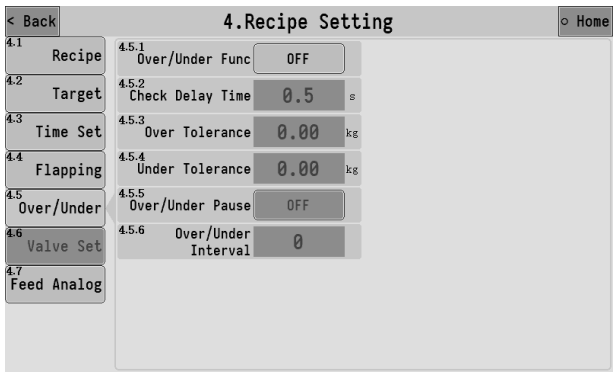
3.4.4.1. Detailed description of patting bag function

Taking the bucket-less scale mode as an example, the signal sequence diagram of all bag-beating signals after feeding and setting values is as follows:



3.4.5. Over/Under

Over and under difference is the collective name of over and under difference or under difference. In the packaging process, when the packaging result is higher than the target value within a certain range, it is considered as over and under difference, and the range is set according to the production demand.

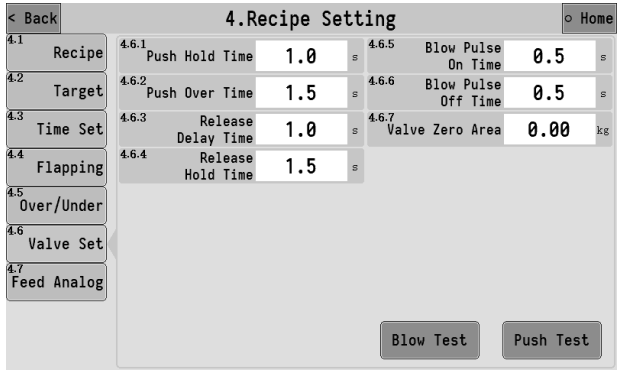


4.5.1	Over/Under Func	① [OFF] ② [ON]：At the end of each feeding, the

		result of feeding will be tested.
4.5.2	Check Delay Time	0.0~99.9s After the end of feeding, delay this time and wait for the current weight stability to carry out the over and under difference detection.
4.5.3	Over Tolerance	In the detection of overerror and undererror, if the weighing result > the target value + overerror value, it is judged as overerror;
4.5.4	Under Tolerance	If the weight value is less than the target value - the underdifference value, it is judged as underdifference.
4.5.5	Over/Under Pause	① [OFF] ② [ON]：When there is overdifference, the controller will alarm and wait for the user to deal with it. At this time, the controller will continue to run after clearing the alarm, or give "I4 stop" signal to return to the stop state for processing.
4.5.6	Over/Under Interval	0~9999 How many times of packing should be inspected for overage and underage at intervals? When the value is set to 0, the overage and underage detection is performed for each package.

3.4.6. Value Set

When 【3.1.1Work Mode】set to ③[value] ,this function takes effect. Set up the valve port scale related to bag pushing, bag unloading and blowing functions.

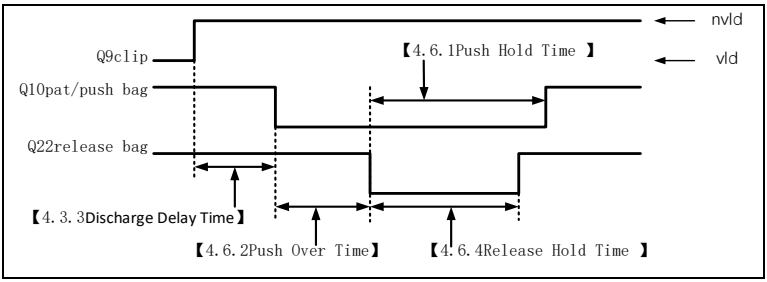


4.6.1	Push Hold Time	0.0~99.9s The holding time after pushing the bag in place.
4.6.2	Push Over Time	0.0~99.9s After the output of "Q10 bag pushing" signal, the bag pushing action is considered to be in place after this time. If the switch output defines "I18 push bag in place", then in this time "I18 push bag in place" is effective, it is immediately considered that the push bag action has been in place.
4.6.3	Release Delay Time	0.0~99.9s When the switch input defines "I9 blocking material detection" and the "I9 blocking

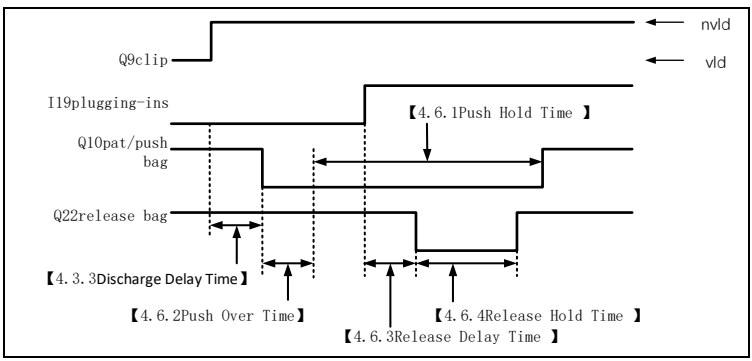
		material detection" signal is effective after the bag is pushed in place, it is considered that the material is blocked under the bagging mechanism at this time and the "Q22 bagging" signal will not be output. When the "I9 plugging detection" signal is invalid, the "Q22 bagging" signal will be output for bagging after the delay set at this time.
4.6.4	Release Hold Time	0.0~99.9s Duration of "Q22 bagging" signal output.
4.6.5	Blow Pulse On Time	0.0~99.9s When feeding, control "Q20 blowing material" for pulse output according to the set effective and invalid time of blowing material.
4.6.6	Blow Pulse Off Time	
4.6.7	Value Zero Area	This parameter takes effect when it is not set to 0. After "Q22 bagging" signal is output, when the detection weight is lower than this parameter setting value, start to go 【4.6.4 Bagging hold time】, when the time is up, turn off "Q22 unloading" signal. When this parameter is set to 0, the weight value is not detected.

3.4.6.1. Detailed description of bag pushing and unloading functions

In valve port scale mode, after bag loosening is completed, 【4.3.3 unloading delay time】 will be started, and the process of bag pushing and unloading will start when the time is over. The sequence diagram of relevant signals of bag pushing and unloading is as follows :(【4.6.7 zero zone value of valve port scale】 is set to 0)



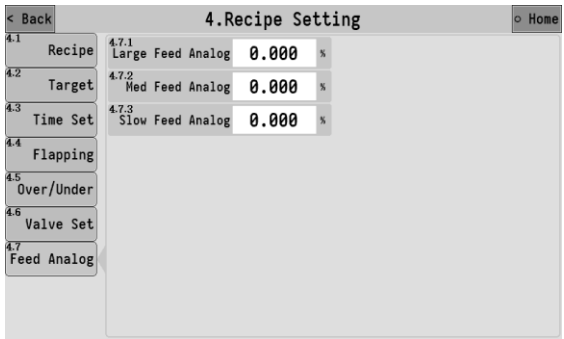
When "I9 plugging detection" signal is defined and the input signal of "I9 plugging detection" is valid during bag unloading, the signal sequence diagram is as follows:



3.4.7. Feed Analog

The analog output function needs to be equipped with the analog output extension.

When the controller is equipped with analog expansion, analog output can be used to control feeding, fast, med and slow can be corresponding to three analog size, to achieve analog control frequency converter or vibration feeder output voltage, feeding different material speed.



4.7.1	Large Feed Analog	0.000~100.000% The size of the analog output at large input.
4.7.2	Med Feed Analog	0.000~100.000% The size of the analog output at med input.
4.7.3	Slow Feed Analog	0.000~100.000% The size of the analog output at slow input.

Note: The analog output percentage set here is related to 【9.1.1 Analog output range】 Settings, for example:

【9.1.1 Analog output range】set to 0~5V

【4.7.1 Large Feed Analog】set to 80.000%

【4.7.2 Med Feed Analog】set to 40.000%

【4.7.3 Slow Feed Analog】set to 10.000%

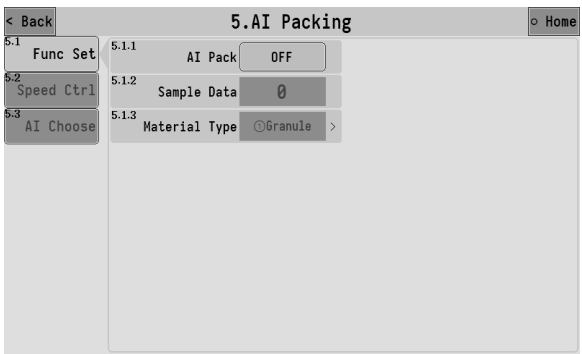
Then the analog output is 4V when the large feeding, 2V when the large feeding, 0.5V when the small feeding, 0V when the stop feeding.

3.5. AI Packing

The controller has the AI intelligent packaging algorithm developed by AMP measurement and control company for the packaging process, which can collect the characteristic parameters of each feeding process, calculate and analyze the collected data through the machine learning AI algorithm, and automatically adjust the parameters, so that the packaging scale operation to achieve both fast and accurate.

3.5.1. Function Settings

AI Intelligent packaging basic function Settings.



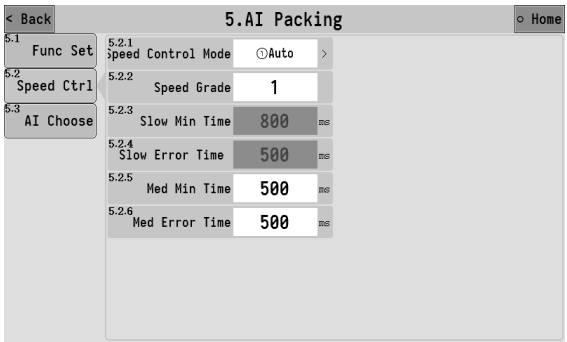
5.1.1	AI Pack	AI intelligent packaging function of the master switch

		When the function is enabled, the controller automatically adjusts the following parameters: 【4.2.2 large Feed】 【4.2.3 Med Feed】 【4.2.4 Slow feed】 【4.2.8 med feeding to prohibit comparison time】 【4.2.9 slow feeding to prohibit comparison time】
5.1.2	Sample Data	The AI intelligent packaging function will save the weighing data of the latest 100 times at most, carry out machine learning AI intelligent packaging algorithm calculation, and get the relevant parameters of feeding suitable for the current state. This project can view the number of saved sampled data. You can enter 0 to clear the saved sampled data and start statistical sampling again.
5.1.3	Material Type	①Granule ②powder Select the material type of packaging, AI intelligent packaging algorithm can be optimized for different types of materials, get more suitable for the characteristics of the material related parameters.

3.5.2. Speed control

AI intelligent packaging function Related to packaging speed control parameters, the AI intelligent packaging algorithm can be set to automatically calculate and control the packaging speed, or the customer can manually set the packaging speed to be controlled, and the AI intelligent packaging algorithm can adjust the parameters to achieve the set speed.

Note: If the packaging speed set manually is too fast and exceeds the speed that the equipment can achieve, inaccurate packaging accuracy may occur.

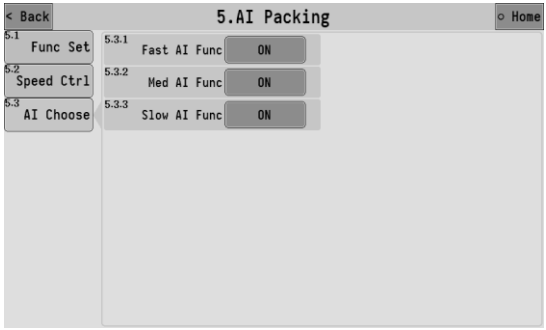


5.2.1	Speed Control Mode	① Auto：The controller automatically controls the packaging speed ② manual：The loading speed is determined by the set parameters【5.2.3 Slow Min time】&【5.2.4 Slow error time】.
5.2.2	Speed Grade	0~4 【5.4.1 control mode】When set to automatic, the smaller the number, the faster the speed.

5.2.3	Slow Min Time	0~9999ms 【5.4.1 control mode】When set to manual, use these two time parameters to determine the standard time of small casting. Slow prohibit comparison time + slow minimum time ≤ slow standard time ≤ Slow prohibit comparison time + slow minimum time + slow error time. The intelligent packaging function controls the small casting time within the standard time by adjusting the leading quantity parameters.
5.2.4	Slow Error Time	
5.2.5	Med Min Time	0~9999ms These two time parameters determine the standard time of CIC. Med prohibited comparison time + Med minimum time ≤ Med standard time ≤ Med prohibited comparison time + Med minimum time + CIC error time The intelligent packaging function controls the Med time within the standard time by adjusting the leading parameters.
5.2.6	Med Error Time	

3.5.3. Modify switch

The correction switch of fast、med and slow can be controlled independently. After the switch is closed, the AI intelligent packaging algorithm will not adjust the corresponding amount of advance.



5.3.1	Fast AI Func	① [OFF]：Do not modify the parameter of 【4.2.2 Fast feed】. ② [ON]
5.3.2	Med AI Func	①[OFF]：Do not modify the parameter of 【4.2.3 Med feed】. ②[ON]
5.3.3	Slow AI Func	① [OFF]：Do not modify the parameter of 【4.2.4 Slow feed】. ② [ON]

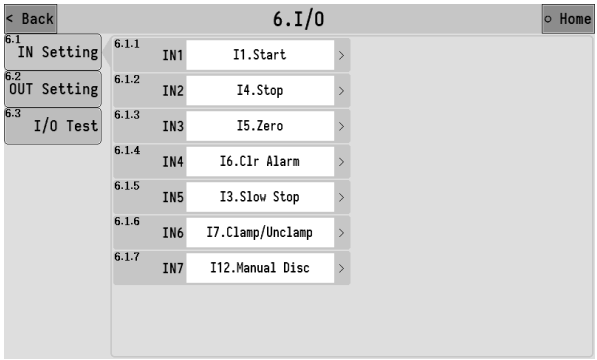
3.6. I/O

It can define the switch input and output corresponding functions, and can use the switch test function to test whether the external switch circuit is normal.

Note: When the switch quantity expansion board is selected, the switch quantity displayed on the interface related to the switch quantity will be different. The following takes the controller interface without the switch quantity expansion board as an example.

3.6.1. Input Definition

Define the functions of switch input ports IN1 to IN7. Click the switch input port to be set and select the function to be defined in the popup option box.



The list of functions available for switching input is as follows:

Function	Function Name	Describe
I0	No definition	No functional definition.
I1	running	Stop running.
I2	running(lvl)	Effective start, ineffective stop.
I3	slowly stop	Enter the slow stop process, that is, automatically stop the operation after the completion of the packaging.
I4	stop	Stop running.
I5	zero	Perform a zero clearing operation.
I6	Clear alarm	Clear alarm status.
I7	clamp/unclamp bag	Pinch/loosen bag operation input signal.

I8	bag clippped	Effectively think that the clamping bag mechanism is in place.
I9	upper level	Storage hopper feeding level detection input signal. When effective, the material is considered to have reached the feeding level. For details, see **Error! Reference source not found.**.
I10	No definition	No functional definition.
I11	lower level	Storage hopper feeding level detection input signal. When effective, the material is considered to have reached the cutting level. For details, see **Error! Reference source not found.**.
I12	manual-disc	Used to manually clear the material in the metering hopper. The input can effectively open the unloading door once and close the unloading door again.
I13	manual-disc(lvl)	Used to manually clear the material in the metering hopper. When the input is valid, open the unloading door; when the input is invalid, close the unloading door.
I14	disc-closed	Discharge door closed in position detection signal.

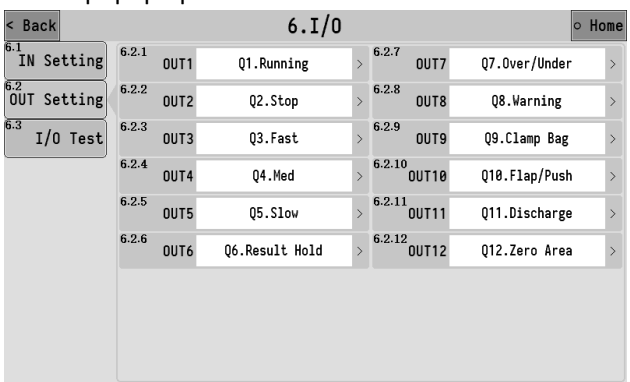
I15	interlock-in	And "Q21 interlock output" with the realization of multi-channel packaging system.For details, see **Error! Reference source not found.**.
I16	safely on-off	In the stop state, when this input is valid, it enters the running state and clips the bag; When running, this input effectively stops and loosens the bag directly.
I17	cmb-select	When the input is effective, the bucket scale mode is operated at high speed, and the material is discharged once after each package is finished. Bucket mode runs in combination mode when input is invalid.
I18	push-bag in place	The detection signal of push bag in place, when effective, it is considered that push bag in place.
I19	plugging-ins	Plugging detection signal of valve port scale mode, plugging detection before bag unloading.For details, see **Error! Reference source not found.**.
I20	air-press-ins	It is used to detect the pressure level. When the signal is valid, it is considered that the pressure is insufficient, and the feeding is

		suspended with an alarm.
I21	tangent in place	Detection input with tangent action in place.
I22	sewing bale inspection	The detection input signal for the start of the sewing function.For details, see**Error! Reference source not found.**.
I23	No definition	No functional definition.
I24	No definition	No functional definition.
I25	No definition	No functional definition.
I26	No definition	No functional definition.
I27	No definition	No functional definition.
I28	No definition	No functional definition.
I29	Lift/drop bracket	It works in the bottomless charging mode to control the rise and fall of the bag holder.
I30	Upper bracket	It works in the bottomless filling mode, and the upper limit of the bag holder detects the input signal.
I31	Lower bracket level	It works in the bottomless filling mode, and the lower limit of the bag holder detects the input signal.
I32	Loose bag allows	If this signal is defined, in the no-bucket mode, after the fixed value, the relevant process will be carried out only after the

		loose bag allows the signal to be effective.
I33	Prohibition of intelligent packaging	If the input is valid, the AI intelligent packaging function is disabled.
I34	Touch screen is prohibited	If the input signal is defined, touch screen is prohibited and communication parameters are allowed to be modified when the input signal is valid. When invalid, touch screen is allowed, communication is prohibited to modify parameters.

3.6.2. Output Definition

Define functions corresponding to switch output ports OUT1 to OUT12. Click the switch output port to be set and select the function to be defined in the popup option box.



The list of functions available for switching output is as follows:

Function	Function Name	Describe
Q0	No definition	No functional definition.
Q1	run	The output is valid when running.
Q2	Stop	The output is valid in the stopped state.
Q3	Fast	Fast control signal.
Q4	med	Med control signal
Q5	slow	Slow control signal
Q6	fixed value	The output will be effective when the feeding is completed, indicating that the feeding has been completed. The duration can be set【4.3.2 Fixed hold time】, and the current weight will be recorded as the packaging result after the fixed holding time.
Q7	ove/und	The function of ove/und is turned on, and the output is effective when the ove/und alarm appears in the feeding result.
Q8	warning	The output is valid when the controller has an alarm.
Q9	clip bag	Clamping bag mechanism control signal, effective clamping bag, ineffective loose bag.
Q10	pat/push bag	Patting bag function control

		signal.For details, see**Error! Reference source not found.**. In valve scale mode, it is the control signal of bag pushing function.For details, see**Error! Reference source not found.**.
Q11	disc	A bucket scale mode controls the unloading door of the weighing hopper.
Q12	zero	The output is effective when the current weight is lower than 【4.2.5 Discharg zero value】.
Q13	filling	Feed control output signal. When the signal is valid, start the feeding device to feed the material to the storage hopper. For details, see **Error! Reference source not found.**.
Q14	batch complete	The signal output is valid after the set batch is accumulated.
Q15	starving	Lack of material output signal. When the signal input of "I11 blanking level" is invalid, it is the state of lacking material.
Q16	disc shaking	Discharging vibration output control signal.For details, see **Error! Reference source not found.**.
Q17	sever material	The output is effective when

		feeding.
Q18	belt	Belt function output control signal.For details, see **Error! Reference source not found.**.
Q19	Discharge/exhaust	Valve scale mode for discharging function, feeding effective output. In the superfine powder mode without bucket, it is the gas pumping energy. For details, see **Error! Reference source not found.**.
Q20	Blow/reverse blow	Valve scale mode for blowing function, feeding according to the set blowing time pulse output. The backblowing function is available in the superfine powder mode without bucket. For details, see **Error! Reference source not found.**.
Q21	interlock out	Realize multi-channel packaging system with interlock input. For details, see **Error! Reference source not found.**.
Q22	release bag	Bagging function control signal in port scale mode. For details, see **Error!**

		Reference source not found..
Q23	Sewing output	Sewing bag output control signal. For details, see **Error! Reference source not found.**.
Q24	Tangent output	Tangents output control signals. For details, see **Error! Reference source not found.**.
Q25	Logic output 1	Logic programming 1 function output signal.
Q26	Logic output 2	Logic programming 2 function output signal.
Q27	Logic output 3	Logic programming 3 function output signal.
Q28	Logic output 4	Logic programming 4 function output signal.
Q29	Logic output 5	Logic programming 5 function output signal.
Q30	Logic output 6	Logic programming 6 function output signal.
Q31	Cylinder lifting	The output control signal of the lifting function of the cylinder in the bottomless charging mode. For details, see **Error! Reference source not found.**.
Q32	Tare abnormal	If the tare does not conform to

		the set tare range value, the alarm will be output.
Q33	Bracket rise (electric)	The output control signal of the support lifting electric control function in the bottomless charging working mode. For details, see **Error! Reference source not found.**.
Q34	Bracket drop (electric)	
Q35	Code function	The output control signal of the coding function. For details, see **Error! Reference source not found.**.

3.6.3. I/O Test

Switch volume test is used to test whether the input switch volume and output switch volume work normally,The interface is as follows:

I/O output test：

The OUT1 to OUT12 buttons are used to test the output function

of the switch quantity. Gray indicates that the output is invalid, and green indicates that the output is valid.

For Exemple：

O UT3 output port is connected to a relay. To test whether OUT3 output is normal, click the OUT3 button to switch the output state to valid. If the line is normal, the relays connected to OUT3 can be observed to close.

I/O input test：

IN1 to IN7 test the input function of the switch quantity. Gray indicates that the switching input is invalid, and green indicates that the switching input is valid.

For Exemple：

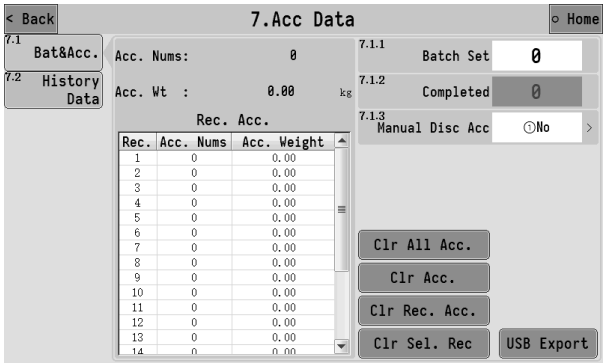
The IN1 input port is connected with a button switch. To test whether the button switch is normal, you can manually press the connected button. If the line is normal, you can observe that the IN1 indicator turns green. After releasing the button, if the line is normal, you can observe that the IN1 indicator turns gray.

3.7. Acc Data

View the batch, cumulative, and historical data of controllers.

3.7.1. Batche and Acc

View the accumulated control values and set the number of batches to be run. The interface is as follows:



7.1.1	Batch No.	Set the number of packaging, when the number of runs reaches the set number of batches, it will stop the packaging process, and alarm to remind. Disable this function when the value is set to 0.
7.1.2	Completed	If the number of batches is set, the number of batches that have been completed is displayed.
7.1.3	Manual Disc Acc	No Yes

When the controller is inserted into a USB flash drive, the

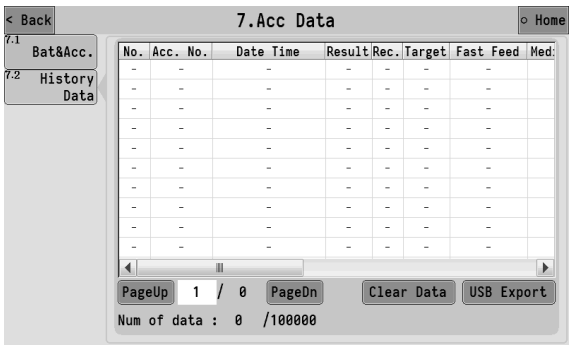
accumulated data file can be exported to the USB flash drive in CSV format.

3.7.2. Acc Data

View the historical data of packaging, including cumulative No, Date, Result, Formulation parameter setting and packaging time, etc.

The controller can store a maximum of 100,000 pieces of historical data. When the storage space is used up, the controller starts to store historical data from number 1 and overwrites the old data.

When the controller is inserted into a USB flash drive, the historical data file can be exported to the USB flash drive in CSV format.



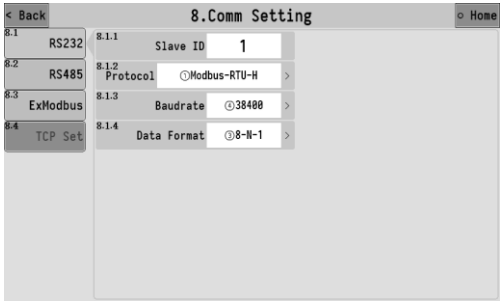
3.8. Communication interface

The controller can be equipped with two completely independent serial communication interfaces RS232 and RS485, and the communication parameters of the two serial ports can be set respectively.

It can also be equipped with RJ45 network port to support ModbusTCP communication.

3.8.1. RS232 Set

This section describes how to set the parameters of an RS232 serial port.



8.1.1	Slave ID	Set the communication address (slave station number) of the device.
8.1.2	Protocol	①[Modbus-RTU-H]：Modbus-RTU protocol（Double-word data is preceded by high word）。 ②[Modbus-RTU-L]：Modbus-RTU protocol（Double word data low word before）。 [ExModbus-H]：Modbus master station（Double-word data is preceded by high word） ③ [ExModbus-L]：Modbus master station（Double word data low word before） ④[automatic printing]：automatic printing of packaging result data. ⑤[Manual print]：Manually print cumulative data.

8.1.3	Baudrate	Set the baud rate for the serial port
8.1.4	Data Format	①[7-E-1]:7 data bits, parity check, 1 stop bit ②[7-O-1]:7 data bits, odd check, 1 stop bit ③[8-N-1]:8 data bits, no check, 1 stop bit ④[8-E-1]:8 data bits, parity check, 1 stop bit ⑤[8-O-1]:8 data bits, odd check, 1 stop bit

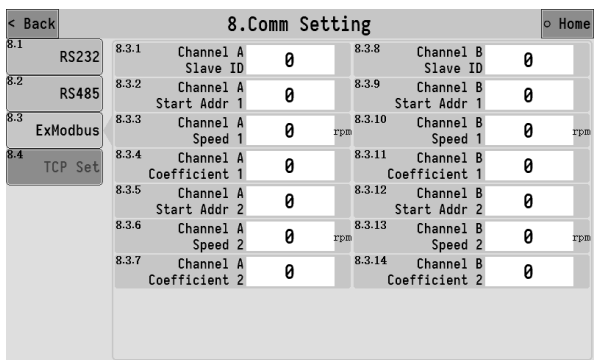
3.8.2. RS485 Setting

For details to see 3.8.1RS232 setting.

3.8.3. ExModbus

When the communication protocol is set as ExModbus, the controller can be used as the master station to read the address of the external device, often used to read the address of the frequency converter, used to set the frequency of the frequency converter to achieve the purpose of controlling the motor speed.

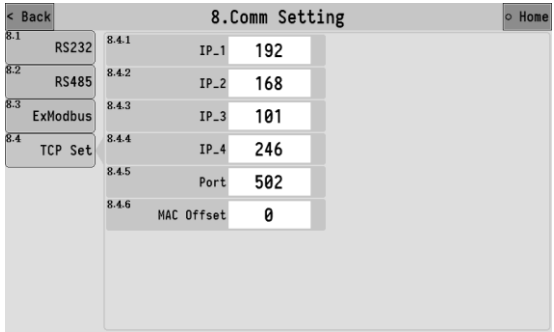
This function supports A maximum of two slave devices (channel A and channel B), and each slave device supports A maximum of two read and write addresses (start ADDRESS 1 and start address 2).



8.3.1	Channel A Slave ID	0~99 Set the slave station number of channel A.
8.3.2	Channel A Start Addr 1	0~65535 Set the read/write address of channel A to 1.
8.3.3	Channel A Speed 1	1~9999999 Set speed 1 of channel A.
8.3.4	Channel A Coefficient	0~9999999 The value of speed 1 x coefficient 1 is written to the corresponding start address 1.
8.3.5	Channel A Start Addr 2	0~65535 Set the read/write address of channel A to 2.
8.3.6	Channel A Speed 2	1~9999999 Set speed 2 of channel A.
8.3.7	Channel A Coefficient 2	0~9999999 The value of speed 2 x coefficient 2 is written to the corresponding start address 2.
8.3.8~8.3.14 The setting method of channel B is the same as that of channel A.		

3.8.4. Comm Setting

You can set network port parameters only when the controller is configured with a network port expansion board. The network port communication protocol is Modbus TCP. The configuration screen is as follows:



Note: The network port parameters take effect only after the controller is restarted after being powered off.

8.4.1	IP_1	Set the IP address of the controller.
8.4.2	IP_2	
8.4.3	IP_3	
8.4.4	IP_4	
8.4.5	Port	Network port Number for communication.
8.4.6	MAC Offset	Offset of the communication MAC address of the network port.

3.9. Analog

The analog output function needs to be equipped with the analog output extension.

Analog interface:

VO+ : indicates the positive terminal of the analog output voltage.

AG: Common negative pole for analog output of voltage or current type.

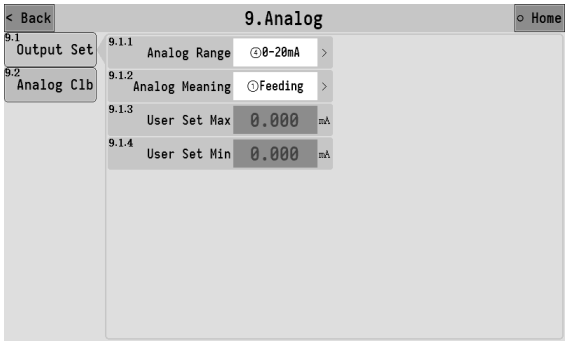
IO+ : current type Indicates the positive terminal of the analog output.

Voltage type Output analog connection VO+ and AG.

Current Type Analog output connect IO+ and AG.

3.9.1. Output Setting

Set parameters related to analog output function.



9.1.1	Analog Range	①[0-5V] ②[0-10V] ③[4-20mA] ④[0-20mA] ⑤[0-24mA] ⑥[Custom voltage ⑦[Custom current]
9.1.2	Analog Meaning	①feeding: feeding can output large, medium and small input corresponding to the size of the simulation, to control the feeding device for feeding. For details can see **Error! Reference source not found.**.
9.1.3	User Set Max	When 【9.1.1 Analog Range】set to⑥[Custom voltage] or ⑦[custom

9.1.4	User Set Min	current]， can use these two parameters to customize the output voltage or current output range.

3.9.2. Analog Calibration

The analog quantity has been calibrated before delivery and can be used directly.

When the analog output is not allowed to have deviation, the analog output can be calibrated to calibrate the output value of the analog.

Here the method of 0~5V voltage calibration is taken as an example to illustrate. The current calibration method is the same as the voltage method.

1. First click on the calibration switch and open state of analog calibration, then point 2 v place there will be a sign of the arrow, instructions are currently calibration of analog point is 2 v, the output voltage of the multimeter is used to measure the actual value (VO + and voltage between AG), normal should be about 2 v, behind and enter into the corresponding actual output values in the input box.

Note: When using the multimeter to measure the voltage, remove the connection line on the VO+ and AG ports to prevent the influence of the back-end circuit on the output voltage value.

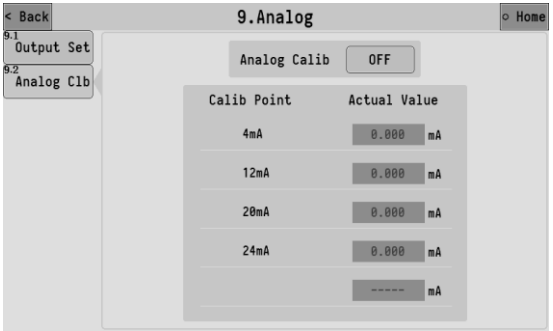
2. Click 4V of the marking point, the arrow switches to 4V of the marking point, measure the actual output voltage value and input it into the corresponding input box.

3. The calibration methods for 6V, 8V and 10V points are the same as above.

4. After all the calibration points are completed, the calibration

state of the analog quantity can be closed to complete the calibration of the analog quantity.

The related interface is as follows:

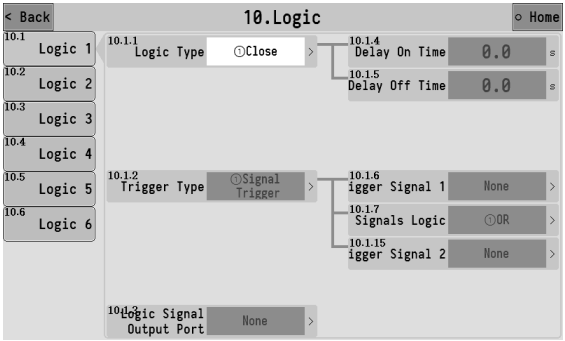


Note: **There is no analog output setting and calibration data when reset all parameters. For analog parameters, click Analog reset**

3.10. Logic

The controller supports six logic programming functions. If the existing functions of the controller cannot meet the control requirements of the device, you can use the logic programming function to define auxiliary logical output signals in addition to the running flow of the controller to control device actions.

The logic programming setting interface is as follows:



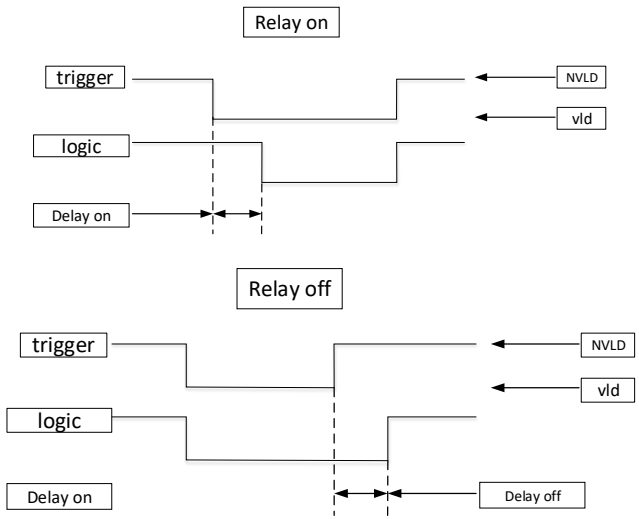
The following uses logic programming 1 as an example to explain the functions of each parameter:

10.1.1	Logic Type	Select the type of logical programming. ①[OFF]：Disable the logical output function. ③ [Delay on] ④ [Delay disconnect] ⑤ [Delay on and delay off] ⑥ [Valid - Invalid jump edge trigger] ⑦ [Invalid - Valid jump edge trigger] ⑧ [lock] ⑨ [pulse] Corresponding function description in detail:
10.1.2	Trigger Type	① [Signal trigger]：The logical output is triggered by a signal. ②[Condition triggered]：Trigger the logical output by reaching a condition. ③[Communication trigger]：The logical output is triggered by a communication command.
10.1.3	Logic Signal Output Port	Select the logical output signal to define to an OUT outlet.

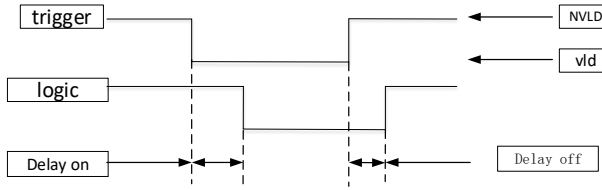
10.1.4	Delay on Time	Logic output signal delay on time.
10.1.5	Delay off Time	The time when the logic output signal is delayed.
10.1.6	Trigger Signal 1	Select signal 1 to trigger the logical output.
10.1.7	Signal Logic	Select the logical relationship between trigger signals 1 and 2 used to trigger the logical output. 1.[or] : Trigger signal 1 and trigger signal 2 can trigger the logical output if either signal is valid. 2.[and] : Trigger signals 1 and 2 need to be valid to trigger the logical output. 3.[XOR] : The logical output can be triggered only when trigger signals 1 and 2 are different.
10.1.8	Output time	【10.1.1 Logic type】You can set this parameter when item 5/6 is set. The valid time of the output after the logic signal is triggered, and the logic output ends when the time expires. When this time is set to 0, the logical output signal will be terminated only by a reset signal.
10.1.9	Reset signal set	【10.1.1 Logic type】You can set this parameter when item 5/6 is set. After the logical output is valid, the reset signal resets the logical output, making the logical output invalid and ending the logical output process.
10.1.10	Reset signal logic	1.[Effective reset] : Reset the logical output when the reset signal is effective. 2.[Invalid reset] : Reset the logic output when the reset signal is invalid.
10.1.11	Trigger Condition Set	Select the condition that triggers the logical output.

		1.[Weight greater than set value] 2.[Weight less than set value] 3.[Weight within range] 4.[Weight outside the range]
10.1.12	set value 1	Used to set the weight value corresponding to the trigger condition.
10.1.13	set value 2	
10.1.14	Weight stability condition	1.[ON] : The logical output can be triggered only when the weight meets the trigger condition and is stable. 2.[Off] : The logic output can be triggered after the weight meets the trigger condition, without stabilization.
10.1.15	Trigger Signal 2	Select signal 2 to trigger the logical output.

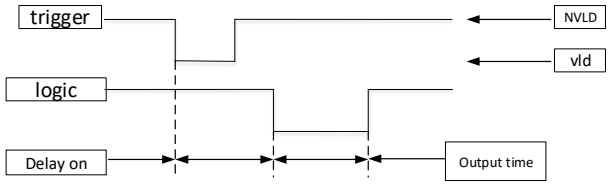
3.10.1. Output sequence diagrams logically



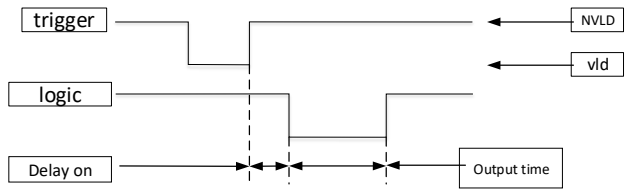
Relay on & delay off



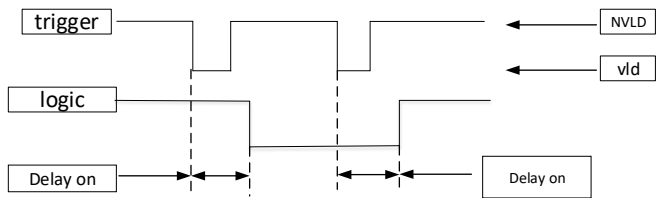
InvAlid to valid jump edge trigger

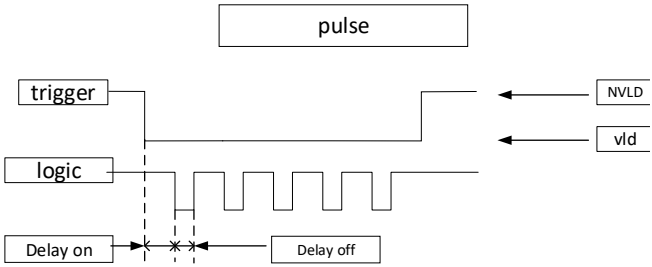


Valid to invalid jump edge trigger



Self-locking





3.10.2. Examples

Through logic programming to achieve the coding function: bag output signal effective, delay 1 second time, and then output OUT12 lasting 2 seconds, used to control the coding machine in the bag after the completion of the code printed on the bag.

The Settings are as follows:

【10.1.1Logic type】: Invalid - Valid jump edge trigger

【10.1.4 Delay on time】: 1s

【10.1.8 Output time】: 2s

【10.1.2 Trigger type】: Signal trigger

【10.1.6 Trigger Signal 1】: Clamp

【10.1.3 Logic Signal Output Port】: 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 achieve the following logic: real-time detection weight is higher than 100kg, output OUT10 for alarm indication. After the alarm is effective, the delay time is 2 seconds, and the output OUT11 lasts 3 seconds to control the unloading mechanism to discharge the material.

The Settings are as follows:

Logic programming 1: realize the output of OUT10 when the detection weight is higher than 100kg.

【10.1.1 Logic type】: Delay on

【10.1.4 Delay on time】: 0s

【10.1.2 Trigger type】: Condition triggered

【10.1.11 Trigger condition set】: Weight greater than the set value

【10.1.12 set value 1】: 100kg

【10.1.3 Logic Signal Output Port】: OUT10

Logic programming 2: implement OUT10 effective delay of 2 seconds, output OUT11 lasts 3 seconds.

【10.2.1 Logic type】: Invalid - Valid jump edge trigger

【10.2.4 Delay on time】: 2s

【10.2.8 Output time】: 3s

【10.2.2 Trigger type】: Signal trigger

【10.2.6 Trigger Signal 1】: Logical output 1

【10.2.3 Logic Signal Output Port】: OUT11

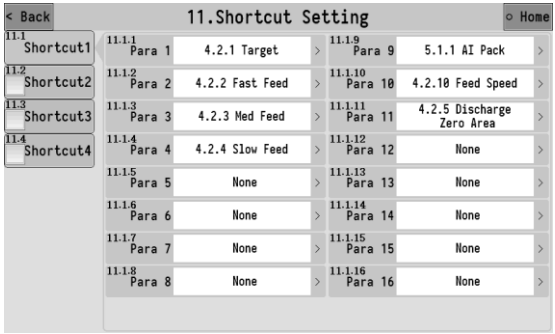
3.11. Shortcut Setting

You can use the Shortcut screen configuration function to configure the parameters displayed in the Shortcut Settings screen (click Shortcut set)to enter the main screen.

A maximum of four pages can be displayed on the shortcut page. Shortcuts 1 to 4 can be selected by the check box on the shortcut page. The selected pages are displayed on the shortcut setting page.

Quick Settings A maximum of 16 parameters can be displayed on each page. Click the option box and select the parameters to be displayed on the shortcut screen.

The shortcut interface configuration is as follows:



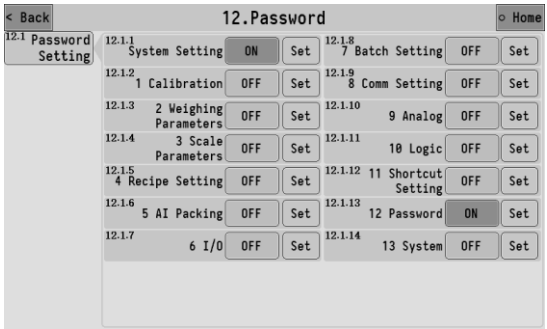
3.12. Password

The System setting button on the main screen and 1 to 13 items on the system maintenance menu screen can set a separate password and password switch for each item.

All passwords are set by default：000000。

To change the password, enter it twice and click OK.

The password management page is as follows:

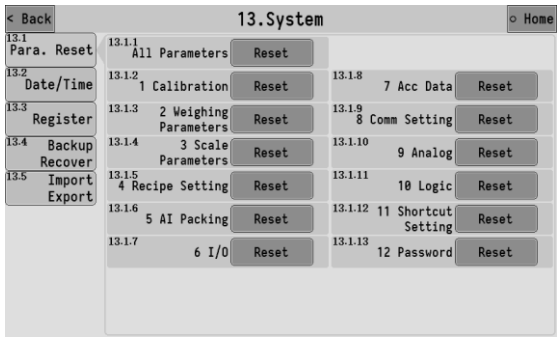


3.13. System

The system interface provides the functions of Para. Reset、Date/Time/Register/Backup Recover/Import Export.

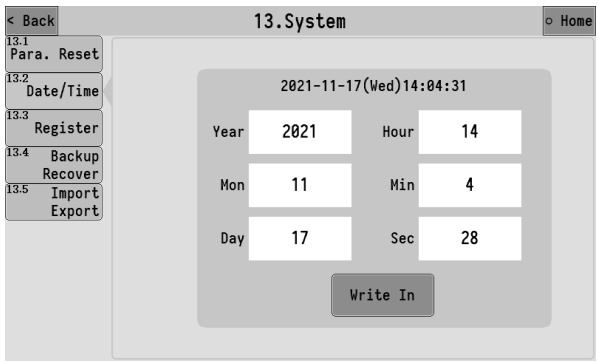
3.13.1. Para. Reset

Press the button Reset to reset corresponding parameter values, and the parameter values will be restored to factory Settings. Exercise caution when performing this operation.



3.13.2. Date/Time

It can modify the time and date of the controller.



3.13.3. Register

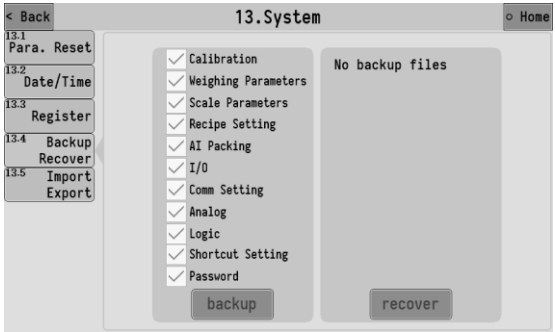
Product use registration Settings.

3.13.4. Backup and Recovery

The parameter values of the controller can be backed up to the memory in the machine, and can be restored when needed.

The parameter items to be backed up can be selected on the left side, and the backup file date is displayed on the right side. You can delete the backup file.

To prevent misoperations, when the parameter Backup and recovery page is displayed, By default, the button Backup and Delete Backup are disabled.Special operations are required to enable the backup and delete backup functions, the operation method is to click position ① three times, then click position② three times, and then click position③ three times to enable backup and delete backup.



3.13.5. Import and Export

The controller can export the current parameters to a USB flash drive in CSV format.

Data export operation:

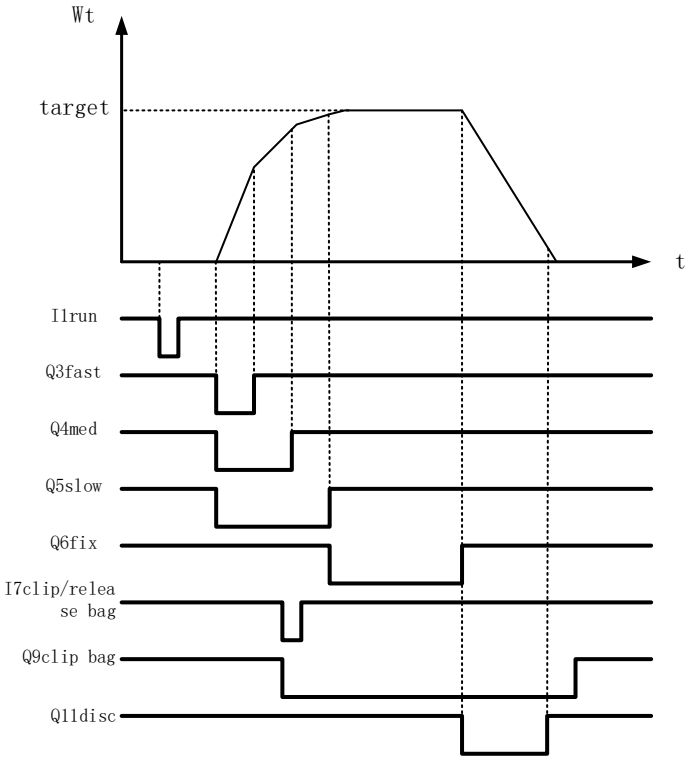
Select the parameter items to be exported on the left of the interface. After inserting the USB flash drive, click USB Export to export the selected items to the USB flash drive.

Data import operation:

Insert a USB flash drive with data files. Data files in the current USB flash drive are displayed in the list on the right of the interface. Select the data file to be imported and click USB Import.

IV. Work Process and Function Description

4.1. With Hopper Process



Combined with the above figure, the basic packaging process of bucket scale is explained:

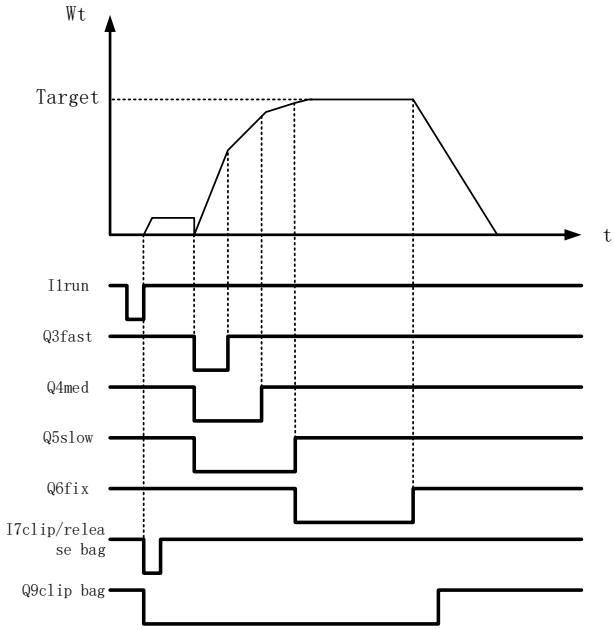
1. Start to ON.
2. 【4.3.1 Delay before feeding】Time.
3. After starting the large throw, collect the weight in real time and

compare the weight. When the weight value≥【4.2.1 target value】-【4.2.2 leading quantity of fast feeding】, close the fast feeding ,start to med feeding;

4. When the weight value≥【4.2.1 target value】-【4.2.3 leading quantity of med feeding】, close the med feeding ,start to slow feeding;
5. When the weight value≥【4.2.1 target value】-【4.2.4 slow feeding drop in level number, close slow feeding, end feeding;
6. 【4.3.2 Fixed hold time】。
7. Start unloading after judging the completion of the clamping bag.
8. When the weight is lower than 【4.2.5 discharging zero zone value】, start 【4.3.3 discharging delay time 】 and close discharging when the time is up.
9. Start 【4.3.5 Delay before bag loosening 】 and release the bag when the time is up.
10. Complete a packaging process and return to Step 1 to start a new packaging process.

Note: The process does not include the description of special functions such as overage and underdifference detection, unloading vibration, material level, etc. If you need to know a certain function, please refer to the section description of the corresponding function.

4.2. Hopper process



Combined with the above figure, the basic packaging process of the bucket scale is explained:

1. Start the operation and wait for the bag to be clamped.
2. Clamp
3. 【4.3.1 Delay before feeding】 time.
4. If 【3.1.6 Bucket packing Mode】is set to ①[gross weight packing], do not peel and directly start feeding.
5. If【3.1.6 No bucket packaging mode】 is set to [net weight packaging], it will judge the stable peeling and start feeding.
6. Start fast feeding，When weight value≥【4.2.1 target value】-【4.2.2 leading quantity of fast feeding】，Close the fast and enter

the med.

7. When weight value≥【4.2.1 target value】-【4.2.3 leading quantity of med feeding】, Close med and enter slow.
8. When weight value≥【4.2.1 target value】-【4.2.4slow feeding drop in level number】, Close slow, end feeding.
9. 【4.3.2 Fixed hold time】
10. Start 【4.3.5 Delay before bag loosening】 and loose when the time is up.
11. Complete a packaging process and return to Step 1 to start a new packaging process.

Note: the process does not include the description of special functions such as overage and underdifference detection, bag tapping, material level, etc. If you need to know a certain function, please refer to the section description of corresponding function.

4.3. Working process of bottomless hopper charging

The workflow process of bottomless filling is the same as that of the standard weighless scale. The difference is that the bottomless filling controls the lifting of the bracket, and the bagging can only be loosened by manually entering the bagging signal when the bagging is loosened.

Main working process of bucket bottom filling type:

1. The meter starts and enters the running state, waiting for the bag to be clamped.
2. After the bag clamping is completed, according to the parameter Settings for stable peeling and other related

processing.

3. According to the parameters of 【3.7 Support lifting】, the support starts to rise automatically or manually.

4. After the support rises, start feeding, and control the support to drop automatically or manually according to the parameters of 【3.7 support lifting】.

5. Feeding is carried out at the same time during the descent process. After the completion of feeding, if the descent of the bracket is not finished, it shall wait for the completion of the descent of the bracket and enter into the fixed value and other functional processing.

6. After the fixed value, wait for manual input signal to loosen the bag.

7. After the bagging is completed, one flow is finished and the next flow cycle is waiting.

4.4. LCS-FK Work Process

The workflow process of valve port scale is basically the same as that of bucket less scale, except for the action control related to bag pushing and bag unloading after bag loosening. See section 3.4.6 for details.

4.5. Working process of dessless superfine powder

The workflow process of sludge-less superfine powder is basically the same as that of sludge-less scale, except for cylinder falling, air pumping and backblowing and other related action control during

feeding. See section 3.3.6 for details.

4.6. Without Scale Exh Working process

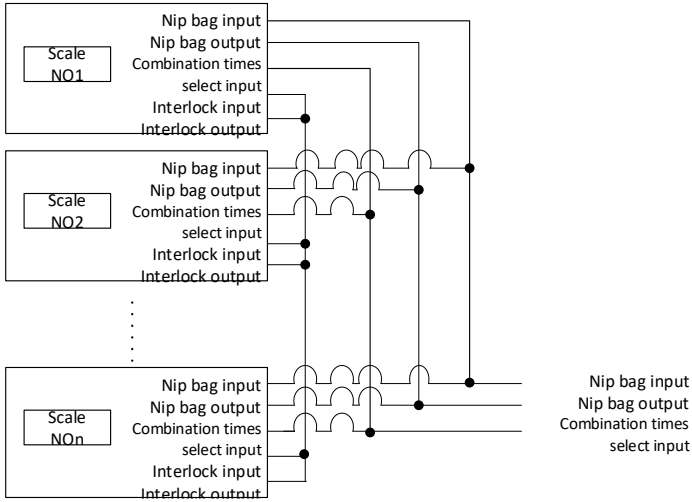
The workflow procedure of bucket free Exh is basically the same as that of bucket free scale. The difference lies in that if there is a bagging signal in the feeding process, the operation will be stopped and the bagging will be loosened. And after the constant value is maintained, the same action control such as cylinder falling, air pumping and backblowing is carried out as for the non-bucket ultrafine powder. Only after the end of the operation can the subsequent process such as patting bag and loosening bag be started.注意：

1. When 【4.6.4 Bag unloading Hold Time】 is set to 0, the bag patting function will not loosen the bag automatically after the extra patting time, and the bag will be loosened manually.
2. When 【4.6.4 Bag-unloading Hold time】is not set to 0, the bag-tapping function will automatically release the bag after the extra patting time and the bag is in place.

4.7. Multi-Scale Combination and Interlock

Multiple AMC501-U can be combined into a multi-channel packaging system (usually in the bucket balance mode). If a multi-channel packaging system needs to be defined"I15 interlock input（level）" and "Q21 interlock output（level）".

the interlock input and interlock output of multiple modules are short-connected, and the wiring mode is shown as follows:



1. Set【3.1.3 Scale NO】of each controller,the scales of each watch cannot be the same. The scale number is related to discharge priority, which is the highest on scale 0 and lowest on scale 7. When the packaging is completed at the same time, the first unloading of high priority materials and the second unloading of low priority materials.
2. “I17 Combination frequency selection”.When the switching quantity input is valid, the bucket scale mode operates at high speed, Each discharging once on the loose bag; When the input is invalid, the bucket mode will run according to the setting mode of 【4.2.6 Times of single balance combination】.
3. Multiple scale combination and batch number: When multiple scales are combined, the number of combinations shall be determined by the 【4.2.6 number of combinations of single scales】". The "number of combinations of single scales" of all instruments must be set to the same value to work normally. Each instrument can also set the number of batches, when the number of batches, will end the packaging. Although the "single scale

combination times" of all instruments must be set to the same value, there can be different batch times. For example, the batch number of meter 1 can be set to 100, and the batch number of meter 2 can be set to 200. The meter that the batch number arrives will end running and will not affect the operation of other instruments. When combined with multiple scales, if you want to use the automatic stop function of batch number, Then the setting of batch number and "single scale combination number" shall meet the following conditions:

N =（Batch number of meter 1+ Batch number of meter 2+ … + Batch number of meter N）/ Single scale combination times

N has to be an integer.

For example, suppose n=2:

Batch number of meter 1：4

Batch number of meter 2：6

So the total number of batches is 10. At this point, if the combination number of single scale is 2, it means that the bag will be loosened once every two times after discharging, and the bag will be released exactly 10 times after 5 times loosening, and the two scales just reach the batch number.

V. Troubleshooting Common Faults

When the controller is running, detailed running steps are displayed on the main screen, indicating the functions and processes that the controller is performing. You can determine the running process of the controller according to the prompts, helping you troubleshoot faults.

The following table lists some faults and troubleshooting methods that the controller may encounter during use:

Number	Content	Instructions

1	ADOFL / -ADOFL	The sensor signal is abnormal. 1. The sensor is incorrectly connected and has poor contact. (Note the four-wire and six-wire connections) 2. The sensor is damaged. 3. The load borne by the sensor exceeds the range.
2	OFL / -OFL	Weight overflow, OFL will be prompted when weight exceeds [1.1.4 Maximum range] setting value. If the empty scale shows OFL, please check: 1. [1.1.4 Maximum range] Is the setting correct? 2. Calibrate the abnormality and calibrate it again. 3. Check whether the sensor is damaged.
3	Equipment static state weight abnormal jump unstable	1. Whether the sensor line connection is correct and reliable, whether the line rust oxidation. 2. Whether weighing mechanism is affected by external force or vibration. 3. Check whether the sensor is damaged. 4. .The sensor or controller is interfered by electrical equipment around the site, such as motors and frequency converters. 5. [2.1.5 Filtering level] Whether the Settings are appropriate.
4	Unable to start	1. Check whether input lines such as the

		external start button are connected to the controller properly (you can test the switch value). 2. Check whether the input port of start signal access is correctly defined as ON.
5	Feeding result is inaccurate	1. Inaccurate results displayed by the controller after feeding: （1） Adjust the setting of Fast, med and small dosage of leading amount of formula parameters. Ensure that the small casting process is long enough to ensure accuracy. （2） Whether the feeding mechanism is normal, whether the following material mouth is blocked, and whether the material flow is smooth. 2. The results displayed by the controller are accurate, but the actual results are accurate. （1） There is a deviation between the display and the actual weight, which needs to be calibrated. （2） It is best to use weights or materials of the same weight as the target value for calibration, and pay attention to the uniform force on the scale platform during calibration, not unbalance loading.
6	Incorrect	The controller records the accumulated value at

	accumulated weight	the end of the fixed value process, so check whether the setting of 【4.3.2 Fixed value holding time】is enough to ensure that at the end of the fixed value holding time, the controller shows that the weight has stabilized and no longer jumps greatly, so as to record the accurate cumulative result of feeding.

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