



AMC501-B

Instruction Manual of Ingredient Controller

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Company web site: <http://www.szamp.com.cn/>

This product carries out the standard:

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

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

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



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1 Basic information

1.1. Features and Specifications

The AMC501-B batching controller is a weighing control instrument specially developed for serial batching equipment in industrial sites based on a touch screen. It supports batching control of up to six types of materials. Users can set the types of materials to be prepared as needed, adjust the batching sequence at will, and flexibly control the pause of the batching process and the allowable conditions for discharge. The AMC501-B features a high-brightness color TFT touch screen display, supporting Chinese and English input and display. It has an elegant graphical interface and a reasonable classification and layout of functions. All these excellent features make the AMC501-B very easy to use.

The AMC501-B ingredient controller has the following basic characteristics:

- TFT high-brightness color touch screen, with both Chinese and English input and display
- Weighing channel: Single channel
- Working voltage: DC24V
- Sensor: DC5V/ 4-wire and 6-wire systems

- IO: 7 inputs /12 outputs
- Installation method: Cabinet installation (tray installation)
- Dimensions: 203×149×50 (length * width * height, mm)

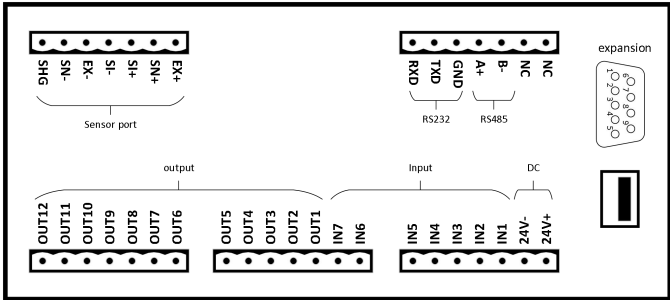
The detailed technical specifications are as follows:

Sensor excitation	DC5V $\pm$ 10%/120mA driving current/can be connected in parallel with 8 sensors of 350 Ω specification
Adapt to sensor sensitivity	2mV/V or 3mV/V
Input signal range	0~15mV
Input sensitivity	0.5uV/d
nonlinear	0.02% FS (at 3mV/V)
zero drift	<0.5 μ V/°C
Gain drift	<10PPM/°C
AD conversion rate	960 times/second
Highest display resolution	1/999999
Product accuracy level	III
Working Voltage	DC24V (compatible with 18V~30V)
Product power consumption	<5W
Operating Temperature	-10°C~45°C
Storage temperature	-20°C~60°C
humidity	Within 90% RH (no

	condensation)
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1.2. Wiring port

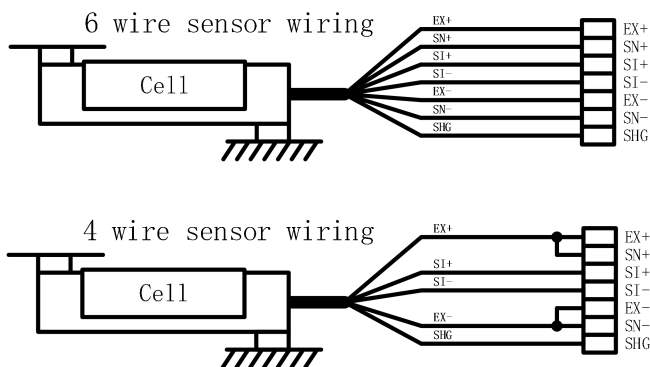
The wiring port is shown in the following figure:



Category	Inter	Explanation
Power supply	24V	The DC24V power supply is positive
	24G	DC24V power supply negative
Sensor Interface	EX+	Sensor excitation positive
	EX-	Sensor excitation negative
	SI+	The sensor signal is positive
	SI-	Negative sensor signal
	SN+	The sensor senses positive.
	SN-	Sensor induction negative
Optional Voltage or current	SHG	Sensor shielding wire
Analog output	A0+	The positive terminal of the analog output 1
	A0-	The negative terminal of the analog output 1 (GND of the analog quantity)

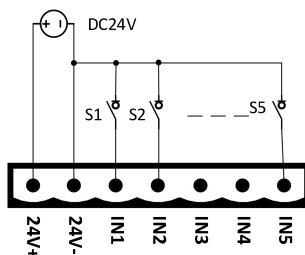
	Note The following text will take the selection of voltage as an example to describe and explain the parameters.		
Comm port (RS485)	A+	RS485 A+	
	B-	RS485 B-	
Comm port (RS232)	TXD	RS232 TXD	
	RXD	RS232 RXD	
	232G	RS232 GND	
Output	OUT1	output 1	Q1. Running
	OUT2	output 2	Q2. Stop
	OUT3	output 3	Q3. Fast
	OUT4	output 4	Q4. Med
	OUT5	output 5	Q5. Slow
	OUT6	output 6	Q6. Disc
	OUT7	output 7	Q7.1# Batching
	OUT8	output 8	Q8.2# Batching
	OUT9	output 9	Q9.3# Batching
	OUT10	output 10	Q10.4# Batching
	OUT11	output 11	Q11.5# Batching
	OUT12	output 12	Q12.6# Batching
Input	IN1	input 1	I1. Running
	IN2	input 2	I2. Stop
	IN3	input 3	I3. Zeroing
	IN4	input 4	I4. Clear alarm
	IN5	input 5	I5. change Rec.
	IN6	input 6	I6. Manual disc/Disc allow
	IN7	input 7	I7. Pause

1.2.1. Sensor wiring method



1.2.2. IO wiring and definition

Schematic diagram of IO, For example, IN1, IN2, and IN5 are shown as follows:

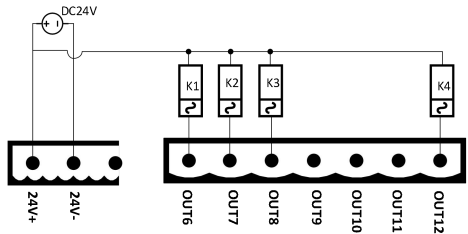


The external circuit drive input switching quantity should meet two points, as follows:

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) :



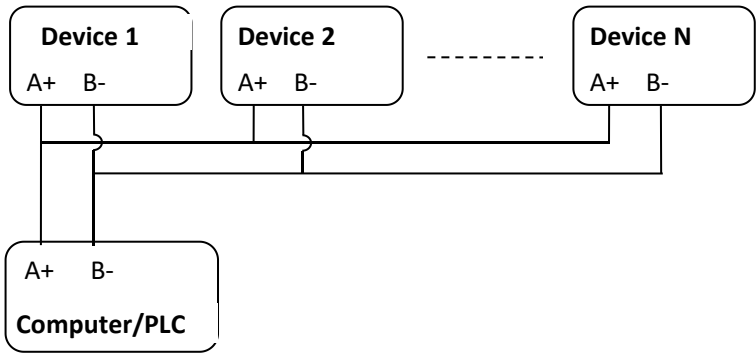
The external circuit driven by output switching quantity should meet two main points:

1. The external circuit should be co-located with the controller;
2. Low level when switching quantity output is active.

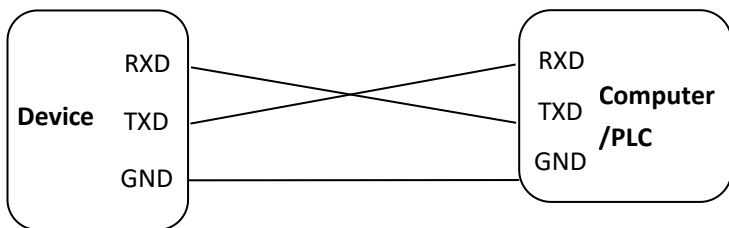
Note: the maximum driving capacity of each switch output is 500mA. Please pay attention to the power of the load when connecting the load. If the power exceeds the driving capacity of the output, the switch output may be damaged.

1.2.3. Serial Port Wiring Method

RS485 Wiring Diagram:



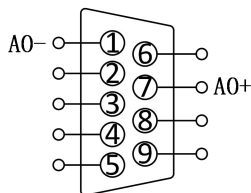
RS232 Wiring Diagram:



1.2.4. Analog output expansion

The controller can be optionally equipped with an analog expansion board. The interface form is DB9 type plug, which can provide one analog output interface. The controller can automatically recognize the expansion board and support V or I output (please specify the required V or I output when placing an order). For detailed descriptions of the functions related to analog quantities, please refer to 3.12 Analog Quantities.

The interface is defined as follows:



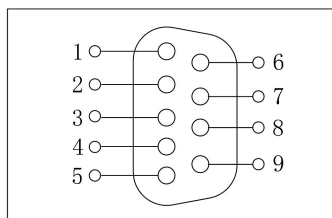
DB9 lead foot	specification
NO.1 lead foot	AO-
NO.2 lead foot	empty
NO.3 lead foot	empty
NO.4 lead foot	empty
NO.5 lead foot	empty
NO.6 lead foot	empty
NO.7 lead foot	AO+
NO.8 lead foot	empty
NO.9 lead foot	empty

Note: The voltage/current switching dip switch is located on the internal circuit board of the instrument. To change the analog output type, the controller needs to be disassembled. The voltage or current output can be selected and configured at the factory.

1.2.5. Switch quantity expansion board

The controller can be optionally equipped with a switch quantity expansion board, with an interface form of DB9 type plug. It can provide an additional 4 input and 3 output switch quantity interfaces. The controller can automatically recognize the expansion board. When the switch quantity expansion board is connected, the switch quantity related function interface will automatically display the added switch quantity function definitions.

The interface is defined as follows:



DB9 lead foot	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

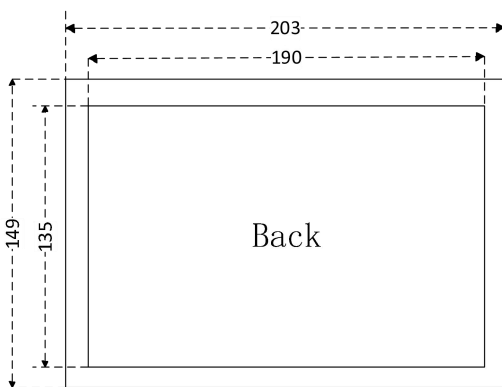
1.2.6. Network port expansion board

The controller can be optionally equipped with a network port expansion board, supporting Modbus-TCP network port communication.

For detailed parameter descriptions, please refer to the 2.7.3 Network port Settings section.

1.3. Installation dimensions

Data unit: mm



Bottom view

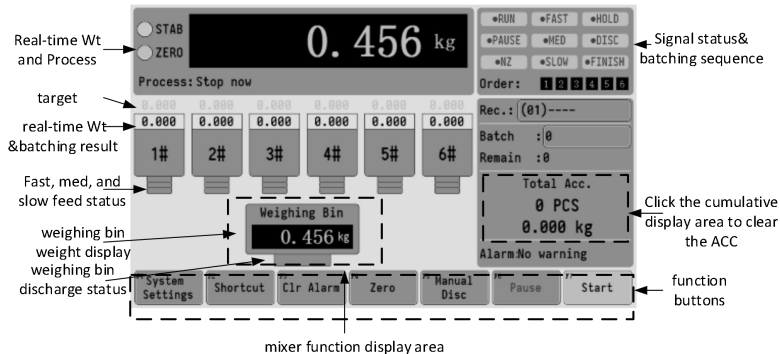


side view

Recommended installation opening size: 192mm×138mm

i. Main interface

After the power-on startup is completed, user will enter the main interface, which is shown in the following figure:



The upper left corner of the main interface displays the real-time weight value and the current operation step prompt.

The upper right corner area shows some of the current main signal statuses, with green for valid and gray for invalid.

The left graphic area in the middle shows the current material feeding status. When materials are added, the corresponding material bin will turn blue and display the real-time material addition value and the addition progress bar.

The content displayed on the middle right side is described as follows:

【Rec】 Displays the currently selected recipe and name. Click to select the recipe. (Only display the recipes for which the

"4.1.2enable choose" function has been ON.

【Batch】 The quantity of ingredients to be completed. Once the set batch is set, the controller will automatically shut down.

【remain】 The number of batches that have been completed.

【Total Acc.】 The total number of times and total weight of the ingredients completed.

Note: Clicking on the total cumulative data display area allows user to clear the cumulative data.

【Alarm】 Indicates the currently generated alarm information.

The bottom column contains function keys, through which parameters can be set and some functional operations can be performed.

F1 System settings: Enter the main interface for controller system maintenance.

F2 Shortcut: Enter the Shortcut Settings interface.

F3 Clear Alarm: When an alarm occurs, click the button to clear it.

F4Zero: Perform a reset operation on the current weight. When the key is gray, it indicates that it is unavailable. For example, it is gray when in operation.

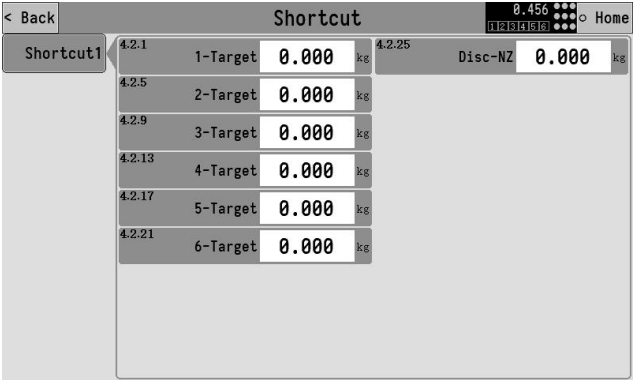
F5 Manual Disc: In the stopped state, the opening and closing of the discharge door can be manually controlled. The "Discharge Allowed" function is in operation.

F6 Pause: Click on it during runtime to enter the pause state.

F7 Start: A gray color indicates a stop status. Click

Start. If the parameters are not set incorrectly, the system will start the batching workflow.

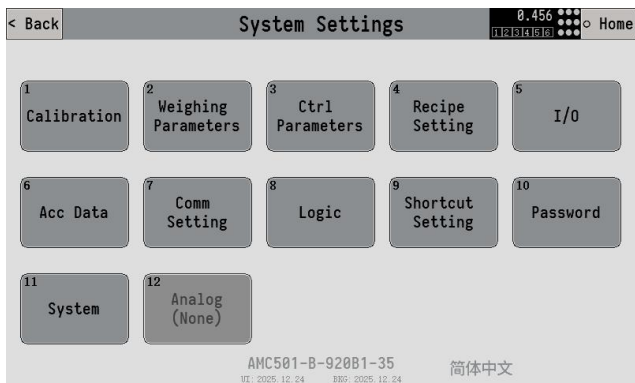
The default parameters of the shortcut Settings interface are as follows. This interface shows which parameters can be freely configured. For detailed explanations, please refer 2.9Shortcut setting to the section.



ii. System maintenance

On the main interface, click on **F1 System setting** to enter the main menu interface for system maintenance, as shown in the following figure:

(Initial password for system maintenance: 000000)



All the parameter setting option entries of the controller are listed in this interface.

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

The following provides a detailed explanation of each major item in system maintenance.

2.1. Weight calibration

Before using the new equipment, the weight needs to be calibrated and the system's unit, decimal point, minimum division, maximum range and other parameters need to be set.

There are two ways to calibrate weight. User can choose either one according to the actual situation

- (1) Weight calibration: Place weights or objects of known weight on the scale platform for calibration.
- (2) Calibration without weights: Directly input the zero-point voltage value, the gain voltage value and the corresponding weight for calibration.

2.1.1. Weight calibration

The screenshot shows a software interface for calibration. At the top, there's a title bar with "< Back" on the left and "Home" on the right. The main title is "1.Calibration". Below the title bar, there are two main sections. On the left, there's a menu with options "1.1 Wt Clb" and "1.2 No Wt Clb". The "1.1 Wt Clb" option is selected. To the right of this menu, there's a table of settings:

Item	Value	Unit
1.1.1	kg	
1.1.2	0.000	
1.1.3	0.001	
1.1.4	100.000	kg

On the right side of the interface, there's a large display area. At the top, it says "Weight" and shows a large number "0.456". Below this, it shows "Sensor Voltage: 0.716 mV" and "Gain Voltage: 0.713 mV". At the bottom of this area, there are two buttons: "Zero Clb" and "Gain Clb".

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

The relative voltage, on the other hand, refers to the difference between the current absolute voltage of the sensor and the voltage value at zero calibration,

which is equivalent to the voltage value generated by the gain weight.

The calibration process can be completed in just two steps: zero-point calibration and gain calibration. The operation is as follows:

- (1) Empty the scale platform. After the signal stable (the sensor voltage does not fluctuate), click the **zero Clb**. If successful, the current weight will be displayed as 0.
- (2) Place the weights or objects of known weight on the scale platform. After the signal stabilizes (the sensor voltage does not fluctuate), click the **gain Clb**. At this time, an input box will pop up. Enter the exact weight of the placed object and click Confirm.

After the above two steps are completed, the weight calibration process is finished, and the controller will display the accurate weight value on the scale platform.

2.1.2. No weight calibration

The screenshot displays a user interface for calibration, titled "1.Calibration". At the top left is a "< Back" button, and at the top right is a "Home" button. On the left side, there is a vertical menu with two options: "1.1 Wt Clb" and "1.2 No Wt Clb". The "1.2 No Wt Clb" option is currently selected, indicated by a grey arrow pointing to it. The main area of the interface is divided into three sections. The top section, labeled "1.2.1", contains a table with two columns: the first column lists calibration parameters, and the second column shows their current values. The parameters and values are: "Zero Voltage" with a value of "0.003 mV", "Gain Voltage" with a value of "3.125 mV", and "Gain Weight" with a value of "2.000 kg". The middle section, labeled "1.2.2", contains a large digital display showing the value "0.456". The bottom section, labeled "1.2.3", contains a button labeled "Calib".

Calibration Step	Parameter	Value	Unit
1.2.1	Zero Voltage	0.003	mV
	Gain Voltage	3.125	mV
	Gain Weight	2.000	kg

1.2.2: 0.456

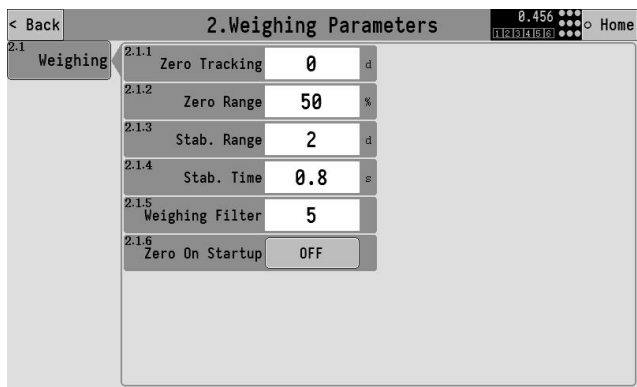
1.2.3: Calib

On this interface, user can input the zero-point voltage, gain voltage and the corresponding gain weight

respectively. Clicking "Calib" will complete the calibration process without weights.

2.2. Weighing parameters

On the system maintenance interface, click the **2. Weighing Parameters** to enter the setting interface of basic weighing parameters. The interface is as follows:



Parameter description list

2.1.1	Zero tracking	0~9d It only works in the stopped state. When the weight value stabilizes within the positive or negative range of this set value ×d (the minimum division value), it automatically performs zeroing.
2.1.2	Zero range	0~99% When performing the zeroing operation, the weight must be less than or equal to "maximum range × zeroing range" to allow zeroing.

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". If the difference between the maximum and minimum values is ≤ the "stabilization range", it is considered that the weight value is stable at this time.
2.1.4	Stab. time	0.1 ~ 9.9 s	
2.1.5	Weighing Filter	0~9 The intensity level of software digital filtering should be set according to the actual debugging effect of the equipment, with appropriate filtering level parameter values. 0: The weakest filtering effect, fast weight response, and poor anti-vibration performance; 9: It has the strongest filtering effect, slow weight response, and good anti-vibration performance.	
2.1.6	zero on startup	After being turned on, the controller will automatically perform a zeroing operation each time it is powered on and started.	

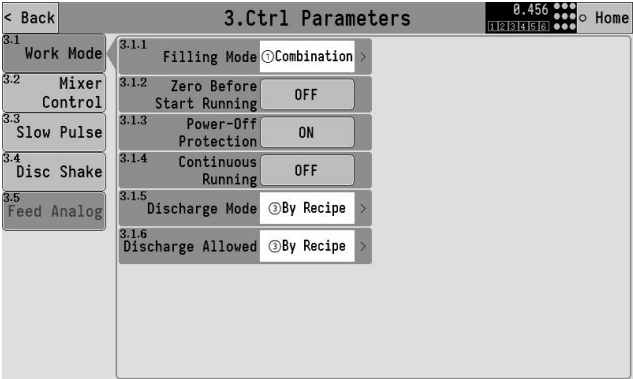
2.3. Control parameters

On the system maintenance interface, click on **3. Ctrl Parameters** to enter the setting interface of the batching

scale control parameters. According to the function and control process, the parameters are divided into several major categories.

2.3.1. Work mode

Parameter Settings related to the mode of the batching scale.



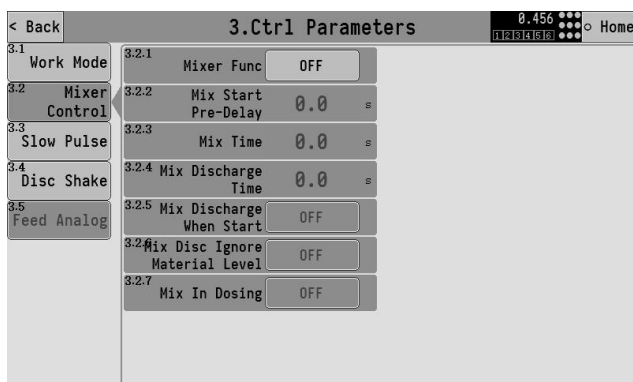
3.1.1	Filling mode	①[Combination]: Fast: The output of fast, medium and slow throw signals is effective. Medium: The output of medium and slow throw signals is effective. Slow: The slow throw signal output is effective. ②[Independent]: Fast: The fast output is effective. Medium speed: The mid is effective. Slow speed: The slow throw signal output is effective.
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3.1.2	zero before Start Running	①[OFF] ②[ON]: After the controller is activated, it will automatically zero before the batching process begins.
3.1.3	Power-off protection	①[OFF] ②[ON]: In the event of an unexpected power failure during the batching process, the controller will automatically save the current batching status. After the power is restored, the controller will automatically enter the pause state before the power failure and can be operated to "continue running" or "stop running".
3.1.4	Continuous running	①[OFF]: It enters a stopped state after each batching process is completed. ②[ON]: Automatically start the next ingredient mixing process after each ingredient mixing process is completed.
3.1.5	Discharge mode	[①after batching]: Discharge is carried out only after all materials have been mixed, and it is not affected by the [4.4.3 Discharge Mode] in the recipe parameters. [②every material]: After preparing one material, discharge can be carried out directly without being affected by the [4.4.3 Discharge Mode] in the recipe parameters. [③by recipe]: Determined by the [4.4.3 Discharge Mode] within the recipe

		parameters.
3.1.6	Discharge allowed	[①no need allow]: Discharge can be carried out immediately without the need for an effective discharge permit signal, and is not affected by [4.4.4 discharge allowed]. [② need allow]: Before discharge, it is necessary to wait for the discharge permission signal to be valid before discharge, and it is not affected by [4.4.4 discharge allowed]. [③by recipe]: It is determined by the recipe parameters within [4.4.4 discharge allowed].

2.3.2. Mixer control

The controller has the function of controlling the mixer, which can control the mixer time and discharging time of the mixer. The detailed parameters are described as follows.

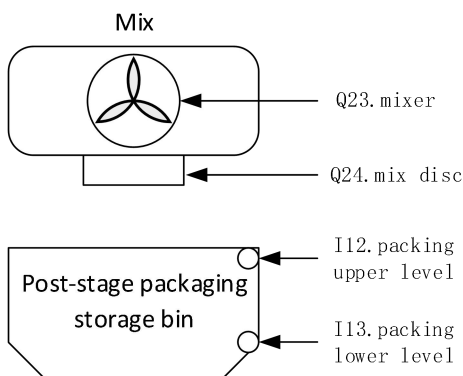


3.2.1	Mixer function	①[off]: The control function of the mixer is turned off. (The relevant controls for
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		the blender function display on the main interface will be shown in gray). ②[ON]: Turn on the mixer control function.
3.2.2	Mixer start pre-delay	0.0 ~ 999.9 s; When the batching is completed and the discharge begins, start this delay time. After the delay ends, output the "Q23 Mix" signal to control the mixer to start mixer.
3.2.3	Mixer time	0.0 ~ 999.9 s; When the "Q23 Mix" signal output time is up, turn off the "Q23 Mix" signal output, stop mixer, and prepare for discharging materials.
3.2.4	Mix discharge time	0.0 ~ 999.9 s; After the mixer is completed, output the "Q24 Mixer and Discharging" signal to control the discharging of the mixer. After maintaining this set time, turn off the "Q24 Mixer and Discharging" signal to end the discharging.
3.2.5	Mix discharge when start	①[Off]: Disable the function of outputting a discharge signal at startup. ②[ON]: When started, it outputs a discharge signal. If the discharging is not completed when the batching is finished, the discharging can only be carried out after the discharging is completed.
3.2.6	Mix discharge ignore material level	①[OFF] ②[ON]: The "I12Packaging upper Level" signal will no longer be monitored in real time during the discharge process.

3.2.7	Mixer in dosing	①[OFF] ②[ON]: Incorporate the mixer process into the batching process. Start mixer after discharge is completed, and the mixer process is also controlled by operations such as pause and slow stop. In addition, when the instrument is in the start-up state, manual mixer and manual mixer discharging cannot be carried out.
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2.3.2.1. Description of the mixer control process



The function diagram of the mixer is shown in the above figure. The control function process of the mixer is as follows:

1. If the "3.2.5 mix Discharge when start" function is ON, the instrument will output the "Q24 mix disc " signal during startup operation. The output time is determined by the "3.2.4 mix Discharge Time". At this point, the ingredient mixing process is proceeding normally. If the "3.2.4mix Discharging Time" has not been reached by the time the

batching is completed, the waiting state will be entered. Discharging will only start after the "Q24 Mixer Discharge" signal stops.

2. After the batching is completed, start the discharge simultaneously with the [3.2.2 Mixer Start Pre-Delay].
3. If the "3.2.7mix in dosing" is ON, the "3.2.2 Mixer Start Pre-Delay" will be initiated only after the discharge is completed.
4. **【 3.2.2 Mixer Start Delay 】** After the delay ends, the controller outputs the "Q23 Mix" signal, and the mixer starts to stir and time.
5. After the mixer duration reaches the set [3.2.3 Mixer Time], turn off the mixer and get ready to discharge the materials.
6. At this point, determine the input status of the upper and lower material levels of the packaging silo.

(1) If the "I12packaging upper level " signal is invalid at this time, it indicates that the material in the subsequent packaging bin is insufficient and can be discharged. At this point, both the "Q23 Mix" signal and the "Q24 mixer disc " signal are output simultaneously. While mixer, discharging is carried out and the timing starts.

(2) If the "I12 packaging upper level" signal is valid at this time, it indicates that the materials in the subsequent packaging silos are full and cannot be discharged. Only when both the "I12packaging upper level " and "I13 packing lower level " signals are invalid will the "Q23 Mix" and "Q24 mixer disc " signals be output. During the mixer process, discharging should be carried out simultaneously, and the timing should start.

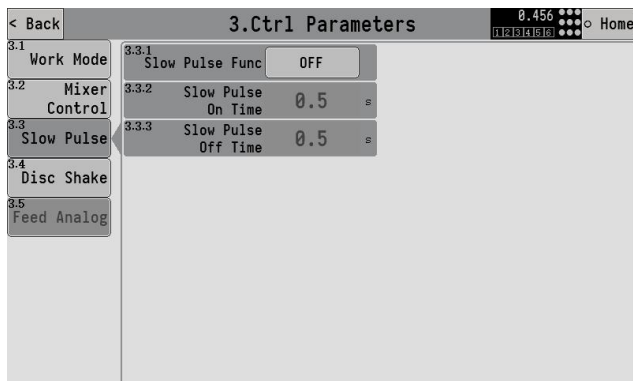
7. After the discharge duration reaches the set [3.2.4 Discharge Time], turn off "Q23 Mixer" and "Q24 Mixer disc", and the

control process of one mixer is completed.

8. During the discharging process, the "I12packaging upper level " signal will be monitored in real time. If it is valid, the "Q23Mixer" and "Q24 mix disc " signals will be immediately turned off, the discharging process will be paused, and the timing will be stopped. Only when both the " I12packaging upper level " and "I13 packing lower level" signals are invalid will the previous discharging process be resumed.
9. If the "3.2.6 Mix disc ignore material level " function is ON, the "I12packaging upper level" signal will not be monitored during the discharging process. At this point, even if the "I12packaging upper level " signal is detected to be valid during the Disc process, the "Q23Mix" and "Q24Mixer Disc" signals will not be turned off.
10. If the "3.2.7 Mixer in dosing " is ON, the batching process will add a waiting state for the completion of the mixing process. The batching process will only end when the mixing control process is completed. The mixer control process will also be controlled by pause and slow stop operations. When the instrument is in operation, manual mixer and manual mixer discharging cannot be carried out.
11. If the next batching process is completed before the mixer control process is over, no discharge will be carried out. Discharge will only start after the current mixer control process is completed.
12. When the controller stops, the mixer control process will also cease. If there is any undischarged material in the mixer, manual discharging operation is required to release the material.

2.3.3. Slow pulse

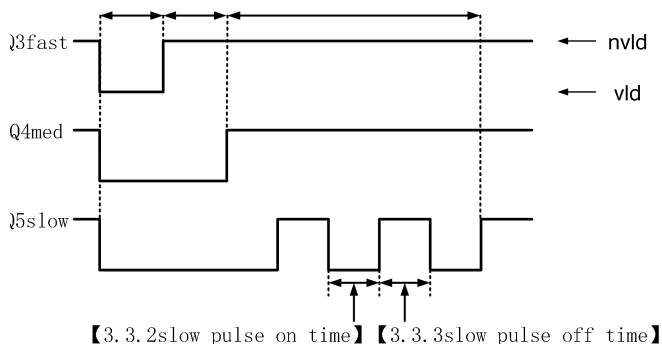
The slow feeder point operation function can control the output signal of the slow feeder to be output in the form of pulse point operation to control the feeding.



3.3.1	Slow pulse Func	①[off]: The "Q5 slow" signal will be output in normal level form. ②[ON]: The "Q5 slow" signal will be output in the form of pulse point motion. Note: The slow dosing point operation function only works during the slow feeding process (when only the slow dosing signal is output).
3.3.2	Slow pulse on time	0.0 ~ 99.9s; The effective time of the output pulse jog of the slow.
3.3.3	Slow pulse off time	0.0 ~ 99.9 s; The ineffective time of the output pulse jog of the slow.

2.3.3.1. Detailed description of the slow point operation function

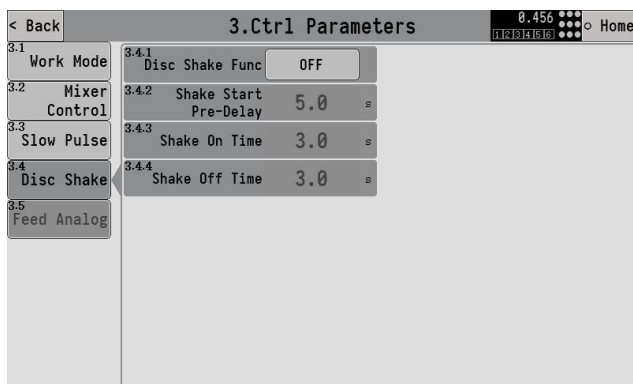
The slow feeding point operation function only works during the slow feeding process. The following figure shows the feeding signal output sequence when the parameter [3.1.1 Feeding Mode] is set to ①[Combination].



2.3.4. Discharge shake

When the material has poor fluidity or certain viscosity, there may be a situation of material adhesion during discharge, resulting in some materials being unable to be normally discharged from the weighing bin.

The discharge shaking function can output corresponding shaking signals to control devices such as vibrators or air hammers to shake the weighing chamber, thereby achieving the purpose of shaking off the materials adhering to the weighing chamber.



3.4.1	Disc shake Fun	①[OFF]/②[ON]
3.4.2	Shake start Pre-delay	0.0 ~ 99.9 s; After the discharge starts, the discharge vibration function begins to output after this delay time.
3.4.3	Shake on time	0.0 ~ 99.9 s; The "Q21 Disc shake" signal is output in pulse form according to the set time to control the operation of the vibration mechanism.
3.4.4	Shake off time	

2.3.5. Feed analog

Note: The analog output function needs to be optionally equipped with an analog output expansion.

When the controller is equipped with an analog output expansion, the analog output can be used to control the feeding. The fast, medium and slow feeders can respectively correspond to three analog quantities, to achieve the control the material speeds of the frequency converter or the vibrating feeder with analog quantities.

Note: The analog output percentage set here is related to the [12.1.1 Analog Range] setting, for example:

【12.1.1 Analog Range】 Set to 0 to 5V

【3.5.1 1- large analog】 Set to 80.000%

【3.5.2 1-Med Analog】 Set to 40.000%

【 3.5.3 1- Slow analog】 Set to 10.000%

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

< Back		3.Ctrl Parameters		0.456	Home
3.1	Work Mode	3.5.1 1-Large Analog	0.000 %	3.5.10 4-Large Analog	0.000 %
3.2	Mixer Control	3.5.2 1-Med Analog	0.000 %	3.5.11 4-Med Analog	0.000 %
3.3	Slow Pulse	3.5.3 1-Slow Analog	0.000 %	3.5.12 4-Slow Analog	0.000 %
3.4	Disc Shake	3.5.4 2-Large Analog	0.000 %	3.5.13 5-Large Analog	0.000 %
3.5	Feed Analog	3.5.5 2-Med Analog	0.000 %	3.5.14 5-Med Analog	0.000 %
		3.5.6 2-Slow Analog	0.000 %	3.5.15 5-Slow Analog	0.000 %
		3.5.7 3-Large Analog	0.000 %	3.5.16 6-Large Analog	0.000 %
		3.5.8 3-Med Analog	0.000 %	3.5.17 6-Med Analog	0.000 %
		3.5.9 3-Slow Analog	0.000 %	3.5.18 6-Slow Analog	0.000 %

3.5.1	1-large analog	0.000~100.000%; The magnitude of the analog output when the No. 1 scale is in fast feed.
3.5.2	1-med analog	0.000~100.000%; The magnitude of the analog output when the No. 1 scale is in med feed.
3.5.3	1- Slow analog	0.000~100.000%; The magnitude of the analog output when the No. 1 scale is in slow feed.
3.5.4	2- Large analog	0.000~100.000%; The magnitude of the analog output when the No. 2 scale is in fast feed.
3.5.5	2- med analog	0.000~100.000%; The magnitude of the analog output when the No. 2 scale is in med feed.
3.5.6	2- Slow analog	0.000~100.000%; The magnitude of the analog output when the No. 2 scale is in slow feed.

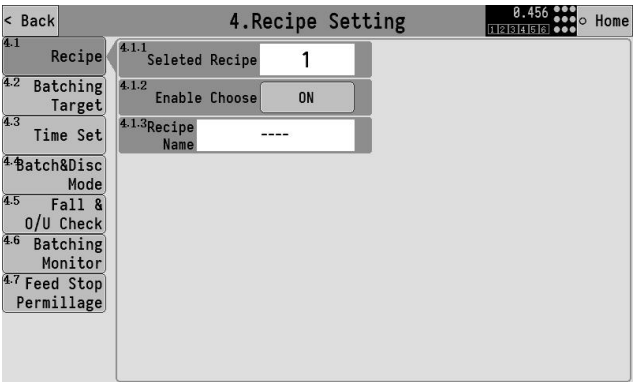
3.5.7	3- Large analog	0.000~100.000%; The magnitude of the analog output when the No. 3 scale is in fast feed.
3.5.8	3- med analog	0.000~100.000%; The magnitude of the analog output when the No. 3 scale is in med feed.
3.5.9	3- Slow analog	0.000~100.000%; The magnitude of the analog output when the No. 3 scale is in slow feed.
3.5.10	4- Large analog	0.000~100.000%; The magnitude of the analog output when the No. 4 scale is in fast feed.
3.5.11	4- med analog	0.000~100.000%; The magnitude of the analog output when the No. 4 scale is in med feed.
3.5.12	4- Slow analog	0.000~100.000%; The magnitude of the analog output when the No. 4 scale is in slow feed.
3.5.13	5- Large analog	0.000~100.000%; The magnitude of the analog output when the No. 5 scale is in fast feed.
3.5.14	5- med analog	0.000~100.000%; The magnitude of the analog output when the No. 5 scale is in med feed.
3.5.15	5- Slow analog	0.000~100.000%; The magnitude of the analog output when the No. 5 scale is in slow feed.
3.5.16	6- Large analog	0.000~100.000%; The magnitude of the analog output when the No. 6 scale is in fast feed.
3.5.17	6- med analog	0.000~100.000%; The magnitude of the analog output when the No. 6 scale is in med feed.
3.5.18	6- Slow analog	0.000~100.000%; The magnitude of the analog output when the No. 6 scale is in slow feed.

2.4. Recipe parameters

The controller has 20 sets of recipe parameters available for

setting. Users can set the commonly used recipe parameters in advance and switch to the corresponding recipe when in use.

2.4.1. Recipe



4.1.1	Selected Recipe	Set the currently used recipe number.
4.1.2	Enable choose	After opening, when user click on the recipe number position on the main interface to select the recipe number, the recipe will be in an optional state.
4.1.3	Recipe name	The name of the recipe can be entered for easy memory. After setting, the corresponding recipe name will be displayed at the recipe number position on the main interface.

2.4.2. Ingredient value

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

< Back		4.Recipe Setting				0.456 ●●● Target 0.000 ●●● Home			
4.1 Recipe	4.2.1 1-Target	0.000	kg	4.2.5 2-Target	0.000	kg	4.2.9 3-Target	0.000	kg
4.2 Batching Target	4.2.2 1-Fast	0.000	kg	4.2.6 2-Fast	0.000	kg	4.2.10 3-Fast	0.000	kg
4.3 Time Set	4.2.3 1-Med	0.000	kg	4.2.7 2-Med	0.000	kg	4.2.11 3-Med	0.000	kg
4.4 Batch&Disc Mode	4.2.4 1-Slow	0.000	kg	4.2.8 2-Slow	0.000	kg	4.2.12 3-Slow	0.000	kg
4.5 Fall & O/U Check	4.2.13 4-Target	0.000	kg	4.2.17 5-Target	0.000	kg	4.2.21 6-Target	0.000	kg
4.6 Batching Monitor	4.2.14 4-Fast	0.000	kg	4.2.18 5-Fast	0.000	kg	4.2.22 6-Fast Feed	0.000	kg
4.7 Feed Stop Permillage	4.2.15 4-Med	0.000	kg	4.2.19 5-Med	0.000	kg	4.2.23 6-Med Feed	0.000	kg
	4.2.16 4-Slow	0.000	kg	4.2.20 5-Slow	0.000	kg	4.2.24 6-Slow Feed	0.000	kg
							4.2.25 Disc-NZ	0.000	kg

4.2.1	1- Target	Set the target weight to be obtained for the batching of material 1#. When set to 0, the batching process of this material number will be automatically skipped.
4.2.2	1- Fast	When adding materials, if the weight value is greater than or equal to the target value - the maximum input value, close the maximum input. When set to 0, it indicates that the large output process will not be initiated.
4.2.3	1- Med	When adding materials, if the weight value is greater than or equal to the target value - the middle range value, turn off the middle range. When set to 0, it indicates that the mid-input output process will not be initiated.
4.2.4	1- Slow	When adding materials, if the weight value is greater than or equal to the target value - the slow, close the slow feeder.

4.2.5~ 4.2.24	The setting of ingredient parameters for materials 2# to 6#. For instructions, please refer to 4.2.1 to 4.2.4.	
4.2.25	Disc-NZ	When discharge, if the current weight is detected to be less than or equal to the zero zone value for discharge, it is considered that the discharge is complete and the discharge door is ready to be OFF

2.4.3. Time setting

Set the relevant time parameters during the feeding process.

< Back		4.Recipe Setting		0.456	●●●	Home
4.1	Recipe	4.3.1 Filling Start Pre-Delay	0.5	s		
4.2	Batching Target	4.3.2 Fast Delay Time	1.0	s		
4.3	Time Set	4.3.3 Med Delay Time	1.0	s		
4.4	Batch&Disc Mode	4.3.4 Slow Delay Time	1.0	s		
4.5	Fall & O/U Check	4.3.5 O/U Check Delay Time	1.0	s		
4.6	Batching Monitor	4.3.6 Result Hold Time	1.0	s		
4.7	Feed Stop Permillage	4.3.7 Discharge Delay Time	1.0	s		

4.3.1	Filling start Pre-delay	0.0 ~ 99.9 s The delay time before the start of adding materials.
4.3.2	Fast delay time	0.0 ~ 99.9 s The vibration elimination time at the beginning of the fast throw. During this time, the fast throw signal remains valid and is not affected by weight. Only after this time ends is it determined whether the

		weight has reached the lead time for the fast throw, and thus the fast throw ends.
4.3.3	Med delay time	0.0 ~ 99.9 s The vibration elimination time at the beginning of the med feed, during which the med signal remains valid and is not affected by weight. Only after this time ends is it determined whether the weight has reached the med lead quantity, thus the med ends.
4.3.4	Slow delay time	0.0 ~ 99.9 s The vibration elimination time at the beginning of the slow throw, during which the slow throw signal remains valid and is not affected by weight. Only after this time ends is it determined whether the weight has reached the slow, and thus the slow ends.
4.3.5	Over/under check delay time	0.0 ~ 99.9 s After the feeding of each material is completed, the Over/under function will be carried out after this period of time. If the Over/under function is turned off, the next material will be fed after the tare is determined to be stable.
4.3.6	Result hold time	0.0 ~ 99.9 s The waiting time after all the material batching is completed. Once this time is up, the current weight record of the batching result is obtained, and then the discharge process begins.

4.3.7	Discharge delay time	When discharge, start this delay when the current weight $\leq$ Disc-NZ. After the delay ends, stop discharge.
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2.4.4. Batching & Disc mode

Set relevant functional parameters such as the batching sequence and discharge mode.

The screenshot shows the '4.Recipe Setting' screen. On the left is a vertical menu with options: 4.1 Recipe, 4.2 Batching Target, 4.3 Time Set, 4.4 Batch&Disc Mode (highlighted), 4.5 Fall & O/U Check, 4.6 Batching Monitor, and 4.7 Feed Stop Permillage. The main area displays settings for 4.4 Batch&Disc Mode: 4.4.1 Batching Order is 123456; 4.4.2 Pause Between Material is 000000; 4.4.3 Discharge Mode is set to 'After Batching' with a right arrow; and 4.4.4 Discharge Allowed is set to 'No Need Allow' with a right arrow. At the top right, there is a display showing '0.456' and a numeric keypad.

4.4.1	Batching order	100000~654321 Set the sequence of ingredients for the materials. Fix a 6-digit decimal number, with each digit representing a material number, and no repetition is allowed. If the number of ingredients is less than 6, add 0 at the end. When 654321 is used, it indicates that the ingredients should be mixed in the order of 6#, 5#, 4#, 3#, 2#, and 1# 123000 indicates that the ingredients should be mixed in the order of 1#, 2#, and 3#.
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		Data such as 123, 104300, 123344, etc. are all incorrect.
4.4.2	Pause between material	000000~111111 The six-digit numbers from left to right respectively represent whether materials 1, 2, 3, 4, 5 and 6 have been paused after being added respectively. 0: No pause. 1: Pause. Each bit can only be 1 or 0; other values are unreasonable. For example, 010110 indicates a pause after the addition of materials 2#, 4# and 5# is completed, but no pause after the addition of other materials is completed.
4.4.3	Discharge mode	①after batching: All materials are unloaded together after being added. ②every material: After each type of material is added, Disc it immediately, and then start adding the next type of material.
4.4.4	Discharge allow	①No need allow: Discharge is carried out directly after the batching is completed. ②Need allow: After the batching is completed, wait for the "I6 Manual Disc/Disc allow " to be valid before discharge.

2.4.5. Fall & over/under check

Parameter Settings related to the fall correction function and the over-limit detection function.

< Back		4.Recipe Setting		0.456 ●●● T13T13T13 Home	
4.1	Recipe	4.5.1	Fall Correct SW OFF	4.5.5	Over/Under Func OFF
4.2	Batching Target	4.5.2	Fall Correct Times 3	4.5.6	Over Range 0.50 %
4.3	Time Set	4.5.3	Fall Correct Range 2 %	4.5.7	Under Range 0.50 %
4.4	Batch&Disc Mode	4.5.4	Fall Correct Depth 50% >	4.5.8	Over/Under Alarm Time 2.0 s
4.5	Fall & O/U Check			4.5.9	Over/Under Pause OFF
4.6	Batching Monitor				
4.7	Feed Stop Permillage				

Fall correction function

In some cases, the fall correction function may be needed to enhance packaging accuracy. The fall correction function continuously corrects the slow fall lead during operation. Its principle is as follows:

The target difference = the weighing result of this time - the target value

2. Average target difference = (Target difference 1 + target difference 2 +... + Target difference fall correction times)/fall correction times;

3. The new slow = the previous slow + the average target difference× fall correct depth.

4.5.1	Fall correct SW	The main switch for the fall correction function. ①[OFF]: No fall correction is performed. ②[ON]: After the feeding is completed, the slow is automatically calculated and corrected.
4.5.2	Fall	0~99

	correct time	The average of the differences in the set number of times obtained by averaging them serves as the basis for correcting the differences.
4.5.3	Fall correct range	1%~99% The percentage of the target value. When the current fall exceeds the set range, this fall will not be included in the arithmetic mean range.
4.5.4	Fall correct depth	There are options of 25%, 50%, and 100%, which represent the extent of each fall correction.
Over-limit and under-limit detection function		
4.5.5	Over/under function	The main switch for the Over/under function ①[OFF]: No Over/under is conducted. ②[ON]: After each feeding is completed, the feeding results will be checked for Over/under. Over/under is a collective term for over or under. During the packaging process, if the packaging result > the target value by a certain range, it is considered over, while if it is lower than a certain range, it is considered under. This range is set according to production requirements.
4.5.6	Over range	0.00%~99.99% When Over/under function, if the weighing result > the target value $\times (1 + \text{Over range})$, it will be judged as over.

4.5.7	Under range	0.00%~99.99% When Over/under function, if the weighing result < the target value $\times$ (1- Under range), it will be judged as under.
4.5.8	Over/under time	0.0 ~ 99.9 s The time when Over/under alarm output occurs.
4.5.9	Over/under pause	When both the Over/under function and Over/under pause are turned on, if Over/under occurs, the controller will alarm and wait for the user to handle it. At this time, after "Clr alarm", the operation will continue, or a "stop" signal can be given to return to the stop state for processing.

2.4.6. Batching monitor

The time for ingredient monitoring can be set. When the actual ingredient time exceeds the set ingredient monitoring time, the controller will enter a pause state and issue an alarm to prompt that the ingredient has exceeded the time limit.

Note: Setting the monitoring time to 0 indicates that the corresponding ingredient monitoring function is turned off.

< Back
4.Recipe Setting

0.456
●●●●
Home

4.1	Recipe	4.6.1	1# Monitor Time	0	s
4.2	Batching Target	4.6.2	2# Monitor Time	0	s
4.3	Time Set	4.6.3	3# Monitor Time	0	s
4.4	Batch&Disc Mode	4.6.4	4# Monitor Time	0	s
4.5	Fall & O/U Check	4.6.5	5# Monitor Time	0	s
4.6	Batching Monitor	4.6.6	6# Monitor Time	0	s
4.7	Feed Stop Permillage	4.6.7	Total Batching Monitor Time	0	s
		4.6.8	Discharge Monitor Time	0	s

4.6.1	1# monitor time	0~999s
4.6.2	2# monitor time	When the material corresponding to the ingredient number exceeds the set ingredient monitoring time, the controller enters a pause state and prompts an ingredient timeout alarm.
4.6.3	3# monitor time	
4.6.4	4# monitor time	
4.6.5	5# monitor time	
4.6.6	6# monitor time	
4.6.7	Total batching monitor time	0~999s; When the batching time of all materials exceeds the total batching monitoring time, the controller enters a pause state and prompts a batching timeout alarm.
4.6.8	Discharge monitor time	0~999s; When the discharge time exceeds the set discharge monitoring time, the controller enters a pause state and prompts a discharge timeout alarm.

2.4.7. Feed Stop permillage

This function enables the automatic modification of the

corresponding fast and med ingredient values when the ingredient target values of materials are modified.

< Back		4.Recipe Setting				0.456 ●●●● 1 2 3 4 5 6 ○ Home	
4.1	Recipe	4.7.1 1# Fast Feed Stop Permillage	1000	%	4.7.7 4# Fast Feed Stop Permillage	1000	%
4.2	Batching Target	4.7.2 1# Fast Med Stop Permillage	1000	%	4.7.8 4# Fast Med Stop Permillage	1000	%
4.3	Time Set	4.7.3 2# Fast Feed Stop Permillage	1000	%	4.7.9 5# Fast Feed Stop Permillage	1000	%
4.4	Batch&Disc Mode	4.7.4 2# Fast Med Stop Permillage	1000	%	4.7.10 5# Fast Med Stop Permillage	1000	%
4.5	Fall & O/U Check	4.7.5 3# Fast Feed Stop Permillage	1000	%	4.7.11 6# Fast Feed Stop Permillage	1000	%
4.6	Batching Monitor	4.7.6 3# Fast Med Stop Permillage	1000	%	4.7.12 6# Fast Med Stop Permillage	1000	%
4.7	Feed Stop Permillage						

4.7.1	1#fast feed stop permillage	The fast investment and med investment values are automatically modified in proportion to the target values. For example: fast feed stop permillage is set at 400%.Med feed stop permillage at 800%. When the target value is set to 10.00kg, the maximum input value is automatically set to 6.00kg, and the med input value is automatically set to 2.00kg.
4.7.2	1#Med feed stop permillage	
4.7.3	2#fast feed stop permillage	
4.7.4	2#Med feed stop permillage	
4.7.5	3 #fast feed stop permillage	
4.7.6	3#Med feed stop permillage	
4.7.7	4 #fast feed stop permillage	
4.7.8	4#Med feed stop permillage	
4.7.9	5#fast feed stop permillage	
4.7.10	5#Med feed stop permillage	
4.7.11	6#fast feed stop permillage	
4.7.12	6#Med feed stop permillage	

2.5. I/O

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

2.5.1. In setting

Define the functions corresponding to the input ports IN1 to IN7. Click on the input port of the switch quantity user want to set, and in the pop-up option box, select the function user want to define.



The list of selectable functions for switch input is as follows:

Number	Function name	Description
I0	None	No function definition.
I1	Running	Start running.
I2	Stop	Stop running.
I3	Zeroing	Perform a reset operation.

I4	Clr alarm	Clear the alarm status.
I5	Change Rec.	Enter once valid to switch to the next opened recipe.
I6	Manual Disc / Disc allow	Manual discharge is allowed when the machine stops, and discharge is permitted during operation.
I7	Pause	Enter the pause state. After entering "I1 Running", it can continue to run.
I8	Running /Stop	Start running when effective. Stop running when it is ineffective.
I9	Slowly stop	Enter the slowly stop process, that is, automatically stop running after the completion of this batching.
I10	Running/Slowly stop	Start running when effective. When ineffective, enter the pause process.
I11	Material level	After the delay time for starting the feeding process ends, the material level signal is detected to be valid before starting the feeding. If it is invalid, wait
I12	packaging upper level	Input signal for material level detection in the packaging silo. When effective, it is considered that the material has reached the feeding level.
I13	packing lower level	Input signal for the detection of the discharge level in the packaging silo.

		When effective, it is considered that the material has reached the discharge level.
I14	Manual mix	Turn on the mixer when it works and turn it off when it works again.
I15	Manual mix disc	When effective, start the mixer and discharging. When effective again, turn off the mixer and discharging.

2.5.2. Out setting

Define the functions corresponding to the switch output ports OUT1 to OUT12. Click on the switch output port user want to set, and in the pop-up option box, select the function user want to define.



The list of selectable functions for switch output is as follows:

Number	Function	Description
Q0	None	No function definition.
Q1	Running	The output is valid when in operation.
Q2	Stop	The output is valid when in the stopped

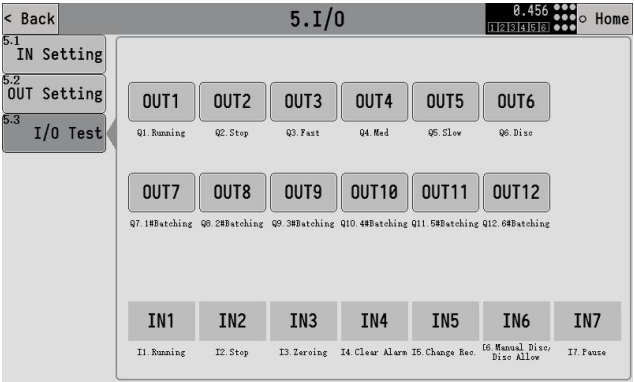
		state.
Q3	Fast	fast feeding control signal.
Q4	Med	Med feeding control signal.
Q5	Slow	Slow feeding control signal.
Q6	Disc	When in the discharge state, the output is effective to control the action of the discharge door.
Q7	1# Batching	The output is effective when the No. 1 ingredient is in operation.
Q8	2# Batching	The output is effective when the No. 2 ingredient is in operation.
Q9	3# Batching	The output is effective when the No. 3 ingredient is in operation.
Q10	4# Batching	The output is effective when the No. 4 ingredient is in operation.
Q11	5# Batching	The output is effective when the No. 5 ingredient is in operation.
Q12	6# Batching	The output is effective when the No. 6 ingredient is in operation.
Q13	Hold	When the batching is completed, the output is valid, indicating that the batching has been completed. The duration can be set with the parameter [4.3.6 result holding Time]. After the fixed holding time ends, the current weight will be recorded as the batching result of this time.
Q14	Over-under	The Over-under function is ON. When Over/under alarm occurs in the feeding

		result, this output is valid.
Q15	Near Zero	The output is valid when the current weight is lower than the [4.2.25 Disc-NZ].
Q16	Stable	The output is effective when the current weight is stable.
Q17	warning	The output is effective when the controller has an alarm.
Q18	Batch complete	The signal output is valid after the batch is completed.
Q19	Pause	The output is valid when it is in a paused state.
Q20	Disc end	After the discharge is completed, this signal output is valid and will be turned off after 1 second.
Q21	Disc shake	Control signal for discharge vibration and striking function.
Q22	Starving	When the "I11 material level" input is defined and the material level input is invalid, this output is valid.
Q23	mix	The output is effective when the mixer is effective.
Q24	Mix disc	When the mix-disc are effective, the output is effective.
Q25	Logic 1	Logic Programming 1 Function output signal.
Q26	Logic 2	Logic Programming 2 Function output signal.
Q27	Logic 3	Logic Programming 3 Function output signal.
Q28	Logic 4	Logic programming 4 Function output signal.
Q29	Logic 5	Logic programming 5 Function output signal.

Q30	Logic 6	Logic programming 6 Function output signal.
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2.5.3. I/O test

Switch quantity testing is a function used to test whether the input switch quantity and output switch quantity ports are working properly. The interface is shown in the following figure



Switch output test

The OUT1 to OUT12 buttons are used to test the output function of the switch quantity. Gray indicates that the switch output is invalid, while green indicates that the switch output is valid.

For example:

The output port of OUT3 is connected to a relay. To test whether the output of OUT3 is normal, user can click the OUT3 button to switch the output state to effective. If the circuit is normal, user can observe that the relay connected to OUT3 is engaged at this time. Clicking the

OUT3 button again to switch the output state is ineffective. If the circuit is normal, user can observe that the relay connected to OUT3 is disconnected at this time.

Switch input test

IN1 to IN7 are used to test the input functions of switch quantities. Gray indicates that the switch input is invalid, while green indicates that the switch input is valid.

For example:

The IN1 input port is connected to a push-button switch. To test whether this push-button switch is functioning properly, user can manually press the connected button. If the circuit is normal, user can observe that the IN1 indicator light turns green. After releasing this button, if the circuit is normal, user can observe that the IN1 indicator light turns gray.

2.6. Cumulative data

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

2.6.1. Batch & Acc.

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

The screenshot shows a control interface titled "6. Acc Data". At the top right, it displays "0.456" and "Home". On the left, there are menu options: "< Back", "6.1 Bat&Acc.", and "6.2 History Data". The main area contains the following fields:

- "Acc. Nums:" with a value of "0".
- "Acc. Wt : 0.000 kg".
- "Material Acc." section containing a table.
- "6.1.1 Batch Set" with a value of "0".
- "6.1.2 Batch Remain" with a value of "0".
- "6.1.3 Manual Disc Acc" with a value of "①No".

The "Material Acc." table has two columns: "Material" and "Material Acc. Weight". It lists six materials, all with a weight of "0.000".

Material	Material Acc. Weight
1	0.000
2	0.000
3	0.000
4	0.000
5	0.000
6	0.000

At the bottom right, there are two buttons: "Clr All Acc." and "USB Export".

6.1.1	Batch set	Set the quantity of ingredients. When the number of runs reaches the set batch number, the ingredient mixing process will be stopped and an alarm will be triggered to remind that the batch is completed. Turn off this function when it is set to 0.
6.1.2	Remain batch	If the batch count is set, this item will display the remaining unfinished batch counts at present.
6.1.3	Manual disc	①[No]

	Acc	②[yes]
--	-----	--------

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

2.6.2. Historical data

View the historical data of the ingredients, including cumulative times, dates, results, recipe numbers and ingredient times, etc.

The controller can store up to 100,000 historical data points. When the storage space is full, it will start storing from sequence number 1 and overwrite the old data.

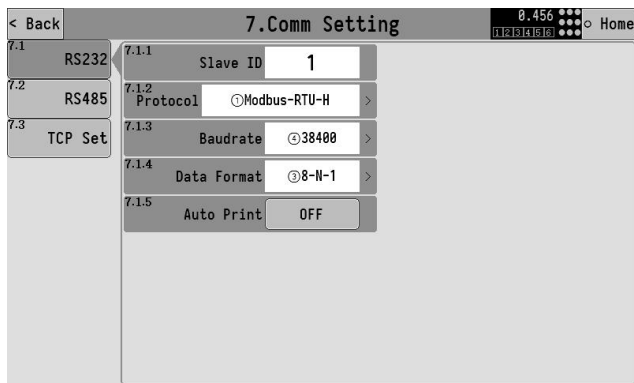
When the controller is inserted into a USB flash drive, the historical data file can be exported to the USB flash drive in CSV format.

2.7. Communication interface

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

2.7.1. RS232

Set the relevant parameters of the RS232 communication serial port.



7.1.1	Slave ID	Set the communication address (slave number) of the device.
7.1.2	protocol	①[Modbus-RTU-H]: Modbus-RTU communication protocol (two-word data with the high word first). ②[Modbus-RTU-L]: Modbus-RTU communication protocol (the lower word of the two-word data comes first). ③[Print]: Connect to a micro printer to print cumulative values or batching results.
7.1.3	Baud rate	Set the baud rate of serial communication ①[4800] ②[9600] ③[19200] ④[38400] ⑤[57600]
7.1.4	Data format	①[7-E-1]:7 data bits, even parity, 1 stop bit ②[7-0-1]:7 data bits, odd parity, 1 stop bit ③[8-n-1]:8 data bits, no parity, 1 stop bit

		④[8-E-1]:8 data bits, even parity, 1 stop bit ⑤[8-0-1]:8 data bits, odd parity, 1 stop bit
7.1.5	Auto print	This parameter takes effect when [7.1.2 Protocol] is set to ③[Print]. ①[OFF] ②[ON]: The result of each batch of ingredients is automatically printed after each batch is completed.

2.7.1.1. Print content format

When [7.1.2 Protocol] is set to ③[Print], the "Print" button will be displayed at the total cumulative data position on the main interface. Clicking the "Print" button will print the current cumulative data. The print format is as follows, including the total cumulative value and the cumulative value of each material:

Total: 21.349 kg

6# : 4.559kg

5# : 3.796kg

4# : 3.080kg

3# : 3.357kg

2# : 3.229kg

1:3.328kg

Count: 3

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When the "7.1.5 Automatic Printing of Batching Results" function is ON, after each batching is completed, the total weight result of this batching and the batching result of each material will be automatically printed. The format is as follows:

Total: 8.769 kg

6# : 1.767kg

5# : 1.615kg

4# : 1.479kg

3# : 1.429kg

2# : 1.345kg

1# : 1.134kg

2022.04.26 14:25

2.7.2. RS485

The setting method can be referred to RS232 Settings.

2.7.3. TCP Set

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

The screenshot displays the '7.Comm Setting' menu on a device. The left sidebar shows a list of options: '7.1 RS232', '7.2 RS485', and '7.3 TCP Set', with '7.3 TCP Set' currently selected. The main area shows the configuration for the TCP Set, with parameters 7.3.1 through 7.3.7. The values are: IP_1: 192, IP_2: 168, IP_3: 101, IP_4: 246, Port: 0, MAC Offset: 0, and Protocol: Modbus-TCP. The top status bar shows '0.456' and 'Home'.

Item	Parameter	Value
7.1	RS232	
7.2	RS485	
7.3	TCP Set	
7.3.1	IP_1	192
7.3.2	IP_2	168
7.3.3	IP_3	101
7.3.4	IP_4	246
7.3.5	Port	0
7.3.6	MAC Offset	0
7.3.7	Protocol	Modbus-TCP

7.3.1	IP 1	Set the IP address of the controller.
7.3.2	IP 2	
7.3.3	IP 3	
7.3.4	IP 4	
7.3.5	Port	The port number for network port communication.
7.3.6	MAC offset	The offset value of the MAC address for network port communication.
7.3.7	protocol	1. [Modbus-TCP-H]: Modbus-TCP communication protocol (two-word data with the high word first). 2. [Modbus-TCP-L]: Modbus-TCP communication protocol (two-word data with the lower word first).

2.8. Logic

The controller supports 6-channel logic programming function. When the existing functions of the controller cannot meet the control requirements of the equipment, user can try to use the logic programming function to define auxiliary logic output signals outside the controller's operation process to control the equipment's actions.

The logic programming Settings interface is as follows:



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

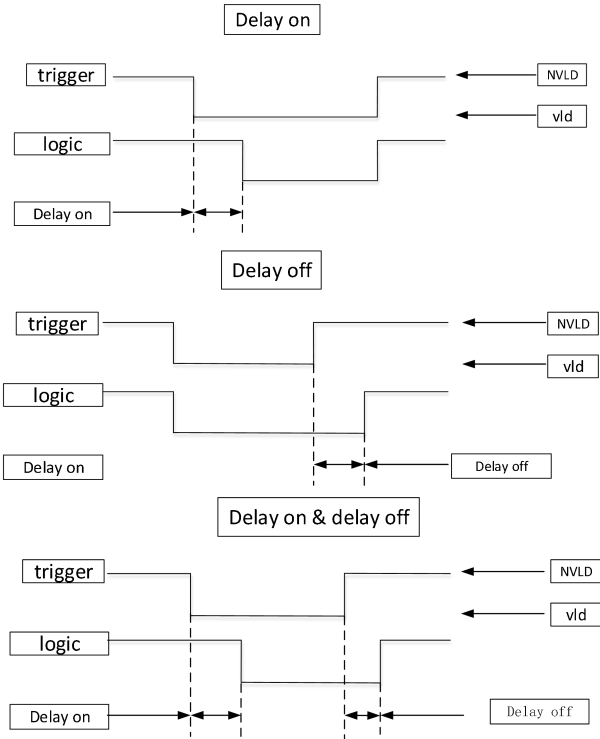
8.1.1	Logic type	Select the type of logic programming. ①[Off]:off this logical output function. ②[Delay on] ③[Delay off] ④[Delay on and Delay off] ⑤[OFF-ON edge triggered] ⑥[ON-OFF edge triggered] ⑦[Self-Hold] ⑧[Pulse] For detailed descriptions of the corresponding functions, please refer to
8.1.2	Trigger type	①[Signal Trigger]: Trigger the logic output through a certain signal. ②[Condition Trigger]: Trigger the logical output by meeting a certain condition. ③[Comm Trigger]: Trigger this logic output through communication commands.

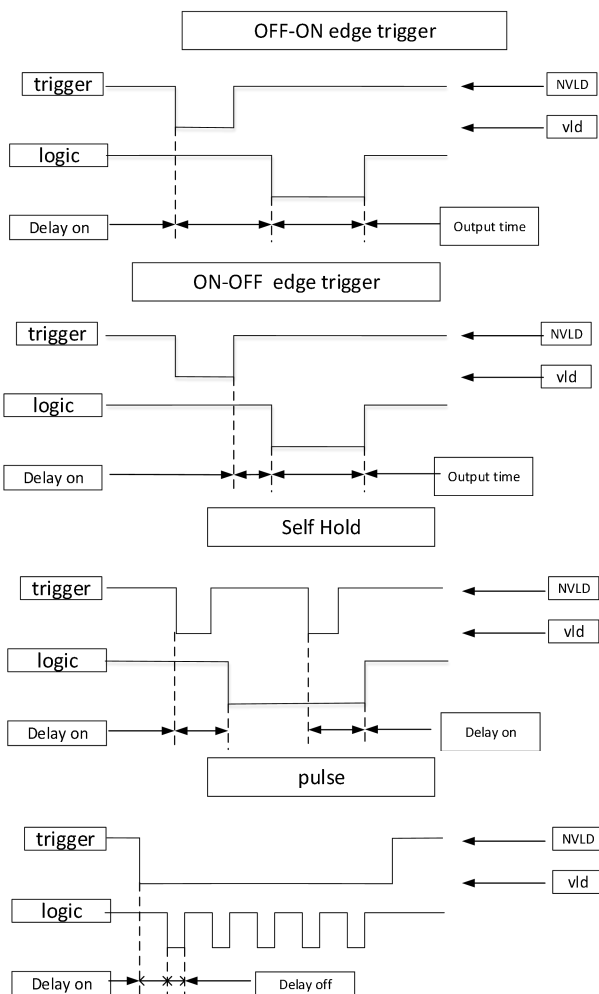
8.1.3	Logic signal output port	Select this logical output signal to be defined to a certain OUT output port.
8.1.4	Delay On time	The time when the logic output signal is delayed and connected.
8.1.5	Delay off time	The time when the logic output signal is delayed and disconnected.
8.1.6	Trigger signal 1	Select the signal 1 used to trigger the logical output.
8.1.7	signals logic	Select the logical relationship between trigger signal 1 and trigger signal 2 used to trigger the logical output. 1.[or]: If either trigger signal 1 or trigger signal 2 is valid, the logical output will be triggered. 2.[and]: Both trigger signal 1 and trigger signal 2 must be valid to trigger the logical output. 3.[XOR]: The logical output can only be triggered when the trigger signal 1 and trigger signal 2 are different.
8.1.8	Output time	[10.1.1 Logic Type] This parameter can be set when it is set to the 5th or 6th item. The valid time output after the logic signal is triggered, and the logic output ends when the time is up. When this time is set to 0, the logical output signal can only end through the reset signal.

8.1.9	Init signal type	[10.1.1 Logic Type] This parameter can be set when it is set to the 5th or 6th item. After the logical output is valid, the reset signal can reset the logical output, making the logical output signal invalid and ending the current logical output process.
8.1.10	Reset signal logic	1. [ON Init]: Reset the logic output when the reset signal is valid. 2. [OFF Init]: Reset the logic output when the reset signal is invalid. 3. [OFF-ON Init]: When the reset signal changes from invalid to valid, reset the logic output. 4. [ON-OFF Init]: When the reset signal changes from valid to invalid, reset the logic output.
8.1.11	Trigger condition	Select the conditions that trigger the logical output. 1. [More than set value] 2. [less than set value] 3. [inside the range] 4. [outside the range]
8.1.12	Set value 1	It is used to set the weight value corresponding to the trigger condition.
8.1.13	Set value 2	
8.1.14	Need stable	1. [ON]: The logical output can only be triggered when the weight meets the trigger conditions and needs to be stable. 2. [Off]: Logical output can be triggered

		once the weight meets the trigger condition, without the need for stabilization.
8.1.15	Trigger signal 2	Select the signal used to trigger the logical output 2.

2.8.1. Logical output sequence diagram





For example:

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

output.

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

Settings are as follows:

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

【8.1.1 Logic Type 】 : Delayed connection

【8.1.4 Delay on Time 】 : 0s

【8.1.2 Trigger Type 】 : Conditional trigger

【8.1.11 Trigger Condition】 : The weight is more than set value

【8.1.12 Set Value 1】 : 100kg

【8.1.3 Logic Signal Output Port 】 : OUT10

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

【8.2.1 Logic Type 】 : off-on edge triggered

【8.2.4 Delay on Time 】 : 2 seconds

【8.2.8 Output Time 】 : 3 seconds

【8.2.2 Trigger Type 】 : Signal trigger

【8.2.6 Trigger Signal 1】 : Logical output 1

【8.2.3 Logical Signal Output Port 】 : OUT11

2.9. Shortcut setting

The parameters displayed in the shortcut Settings interface (enter by clicking F2 on the main interface for shortcut Settings can be configured through the shortcut interface configuration function.

The shortcut interface can display up to 4 pages, from Shortcut 1 to 4. Among them, Shortcut 2 to 4 can be selected through the checkboxes in the interface. The selected interfaces will be displayed in the shortcut Settings interface.

The shortcut Settings can display up to 16 parameters per page. Click the corresponding option box and select the parameters that need to be displayed in the shortcut interface.

The shortcut interface configuration is as shown in the following figure:



2.10. Password management

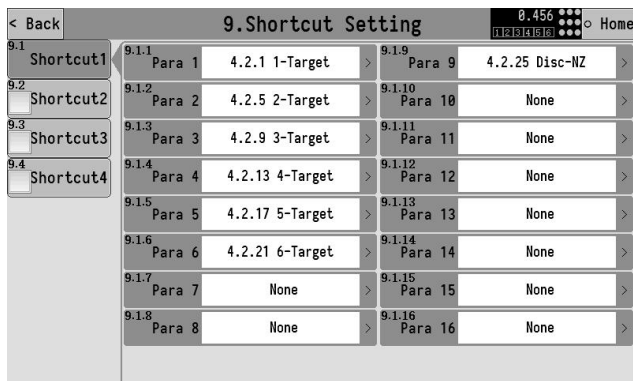
The F1system maintenance button on the main interface and the 1 to 12 major items on the system maintenance menu interface can

each be set with a separate password and password switch.

By default, all factory passwords are: 000000.

When changing the password, user need to enter it twice. Just click "OK" to complete the modification.

The password management interface is as follows:

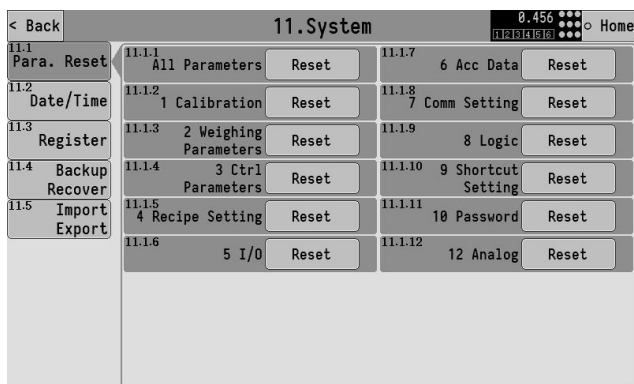


2.11. System

The system interface includes functions such as parameter reset, time and date, product registration, parameter backup and recovery, and data import and export.

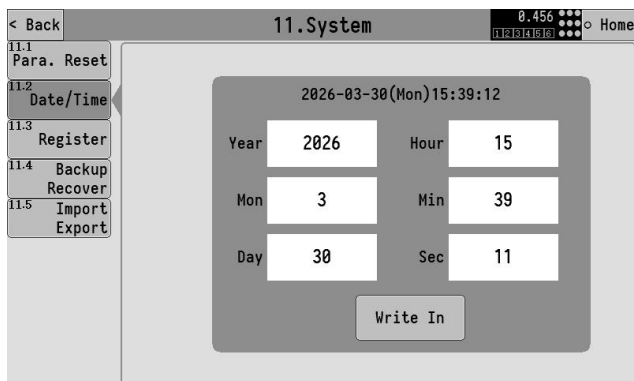
2.11.1. Para. Reset

Click **Reset** button to reset the corresponding parameter values. The parameter values will be restored to the factory Settings. Please operate with caution.



2.11.2. Date /Time

The time and date of the controller can be modified.



2.11.3. Product registration

Product usage registration Settings.

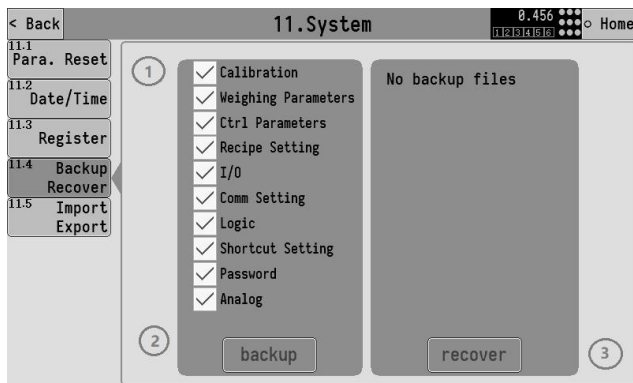


2.11.4. Parameter backup and recovery

The current parameter values set by the controller can be backed up to the local memory, and recovery operations can be performed when needed.

On the left side, user can select the parameter items to be backed up. On the right side, it shows whether there are any backed-up files in the current local machine and the date of the backed-up files in the current local machine. User can also perform deletion operations on the currently backed-up files.

To prevent accidental operation, when entering the parameter backup and restore interface, the **backup** button and **delete** button are disabled by default. Special operations are required to enable the backup and delete backup functions. The operation method is to click the position shown in the following figure ① three times, then click the ② position three times, and then click the position ③ three times again to enable the backup and delete backup functions.



2.11.5. Import Export

The controller can export the currently set parameters to a USB flash drive, and the exported file is in CSV format.

Data export operation

On the left side of the interface, select the parameter items user need to export. After inserting the USB flash drive, click "USB Export" to export the selected items to the USB flash drive.

Data import operation

Insert the USB drive with data files. The list on the right side of the interface will display the data files currently existing on the USB drive. Select the data files user need to import and click USB Import.



2.12. Analog quantity

Note: The analog output function needs to be optionally equipped with an analog output expansion.

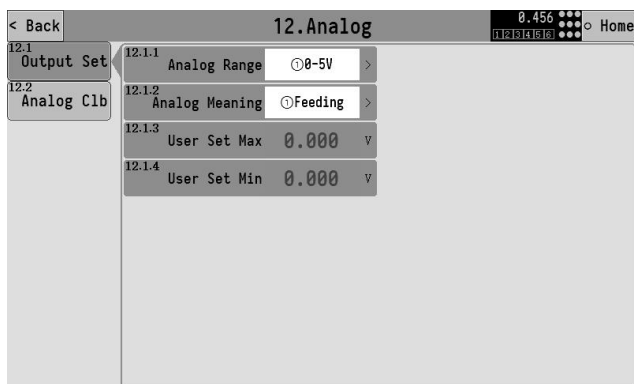
Analog output interface

A0+ (Pin 7 of DB9 connector): Positive terminal for analog output.

A0- (Pin 1 of DB9 connector): Negative terminal for analog output.

2.12.1. Output Settings

Set the relevant parameters of the analog output function.



12.1.1	Analog range	①[0-5V] ②[0-10V] ③[4-20mA] ④[0-20mA] ⑤[0-24mA] ⑥[user set V] ⑦[user set I]
12.1.2	Analog meaning	① Feeding: When feeding, the analog quantities corresponding to fast, medium and slow feeders can be output respectively to control the feeding device to feed. For detailed functions, please refer to Section 3.3.5. ②material Wt: Output the magnitude of the analog quantity corresponding to the real-time material weight during operation. ③total Wt: Output the total weight of the materials in the weighing chamber during operation.

12.1.3	User set max	【12.1.1 Analog Range】 When set to ⑥[user set V] or ⑦[user set I], the output range of the voltage or current can be customized through these two parameters.
12.1.4	User set min	

2.12.2. Analog calibration

The analog quantity has been calibrated at the factory and can be used directly.

When the analog output is inaccurate or deviated, an analog calibration operation can be performed to calibrate the output value of the analog.

Here, the method of voltage calibration from 0 to 5V is taken as an example for illustration. The method of current calibration is the same as that of voltage calibration.

First, click the calibration switch to activate the analog quantity calibration state. Then, an arrow will appear at the calibration point 0V, indicating that the current analog quantity point being calibrated is 0V. Use a multimeter to measure the actual voltage output value (the voltage between AO+ and AO-), which should be around 0V normally. Then input it into the corresponding input box for the actual output value at the back.

Note: When measuring voltage with a multimeter, please remove the connection wires on the AO+ and AO- ports to prevent the subsequent circuit from affecting the output voltage value.

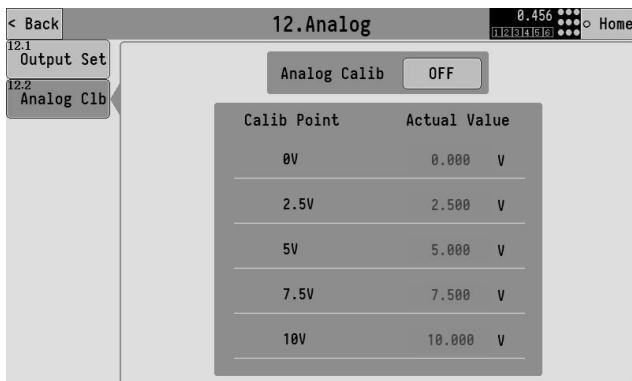
2. Click on the 2.5V mark point, and the arrow will switch to the 2.5V mark point. After measuring the actual output voltage value, input it into the corresponding input box.

The calibration methods for 3.5V, 7.5V and 10V points are the

same as above.

After all the calibration points have been completed, the analog quantity calibration state can be turned off to complete the calibration of this analog quantity.

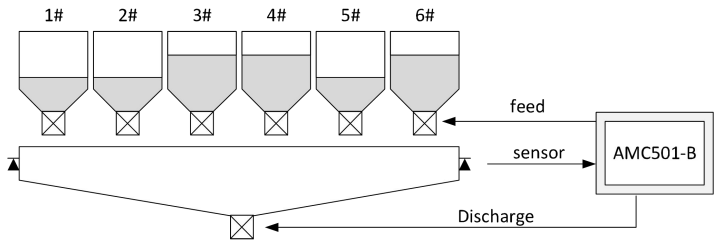
The relevant interface is as follows



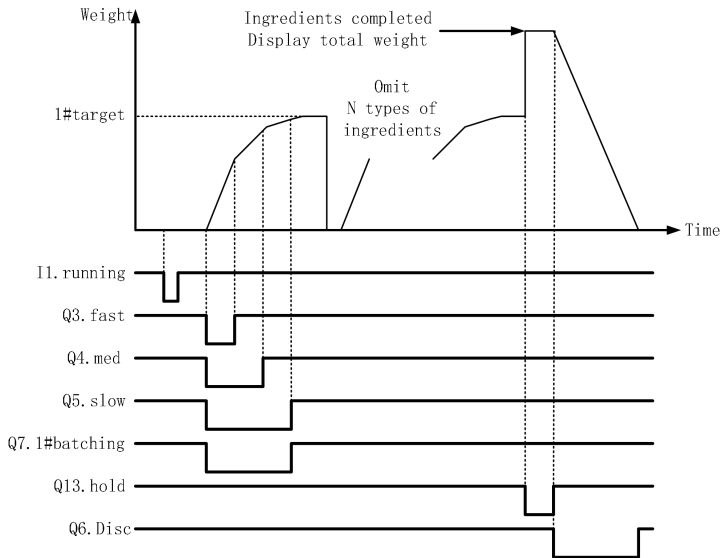
Note: When resetting all parameters, do not reset the analog output Settings and calibration data. For analog parameters, click the separate analog reset button.

iii. Workflow description

4.1. diagram of equipment structure



4.2. Ingredient preparation process



Based on the above figure, explain the basic batching process of the batching controller:

1. Start running.
2. According to the parameter "4.4.1 batching order", start batching from the first ingredient.
3. **【4.3.1 filling start Pre-delay】** Time.
4. Start the fast feeding. When the weight value is $\geq [\text{target}] - [\text{fast}]$, turn off the fast feeding and enter the med feeding.
5. When the weight value is $\geq [\text{target}] - [\text{med}]$, turn off the med feeding and enter the slow.
6. When the weight value is $\geq [\text{target}] - [\text{slow}]$, close the slow and end the feeding.
7. Delay [4.3.5 O/U check delay Time].
8. According to the "4.4.2 Pause Between Materials" function setting, determine whether a pause is needed after the current material feeding is completed.
9. After confirming that the weight is stable, remove the skin and start preparing the next ingredient from a weight of 0.
10. When all the materials have been batched, display the total weight batching result of all the materials and start the [4.3.6 result hold Time].
11. After result hold Time, based on the Settings in [4.4.4 discharge allowed], determine whether to directly start discharge or wait for the external "I6 Disc Allow" signal to be valid before starting discharge.

12. After the discharge starts, if the current weight is lower than the set [4.2.25 Disc-NZ], start the [4.3.7 discharge delay Time], and then stop the discharge when the time is up.
13. At this point, one batching process is completed. Under normal circumstances, after completing one batching process, it will return to the stop state.
14. If the "3.1.4 Continuous running" is ON, it will return to step 2 to automatically start the next batching.

Note: The controller will automatically determine the target values of each material number and automatically skip the feeding process of the material number with the target value set to 0.

Troubleshooting Common Faults

When the controller is running, the main interface will display detailed operation steps, indicating the current function and process that the controller is performing. Through this prompt, the current operation process of the controller can be determined, which helps to troubleshoot.

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

number	Content	Explanation
1	ADOFL / - ADOFL	The sensor signal is abnormal. 1. The sensor circuit is wrongly connected and the contact is poor. (Pay attention to the connection methods of four-wire and six-wire systems) 2. The sensor is damaged. 3. The load on the sensor exceeded its range.
2	OFL / -OFL	Weight overflow: When the weight exceeds the set value of [1.1.4 maximum Range], OFL will be prompted. If the empty scale shows "OFL", please check 1. 【1.1.4 Maximum Range】 Is the setting correct? 2. Calibration is abnormal. Recalibrate. 3. Is the sensor damaged?
3	The weight of the equipment is abnormally	1. Check whether the sensor circuit connection is correct and reliable, and whether the circuit is rusty or oxidized.

	fluctuating and unstable when it is stationary	2. Whether the weighing mechanism is affected by external forces or vibrations. 3. Is the sensor damaged? 4. Sensors or controllers are subject to interference from electrical equipment around the site, such as motors and frequency converters. 5. 【 2.1.5 Filter Level 】 Whether the setting is appropriate.
4	Cannot start	1. Whether the external start button and other input lines are properly connected to the controller (which can be checked through switch quantity testing). 2. Whether the input port definition for the startup signal access is correctly defined as startup.
5	The result of adding materials is inaccurate	1. After the feeding is completed, the result displayed by the controller is inaccurate. (1) Adjust the Settings of the lead amounts for fast, medium and slow dosages in the recipe parameters. To ensure accuracy, it is necessary to guarantee that the slow casting process has sufficient time. (2) Check whether the feeding mechanism is normal, whether the discharge port is blocked, and whether the material flow is smooth. 2. The result displayed by the controller is

		accurate, but the actual re-weighing result is inaccurate. (1) There is a deviation between the displayed weight and the actual weight, and calibration is required. (2) It is best to use weights or materials of the same weight as the target value for calibration. During calibration, pay attention to the uniform force on the scale platform and avoid uneven loading.
6	The cumulative weight of the materials is inaccurate	The moment when the ingredient controller records the cumulative value of each material is after the addition is completed. The cumulative value is recorded at the end of the "4.3.5 Excess and Shortage Detection Time". Therefore, check whether the setting of the "4.3.5 Excess and Shortage Detection Time" is sufficient. It is necessary to ensure that when the time ends, the weight displayed on the controller has stabilized and no longer fluctuates significantly. Only in this way can accurate material accumulation results be recorded.