



AMC501-J

Loss-in-Weight Controller Manual



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This product complies with the following standards:

- GB/T 7724-2008 "Electronic Weighing Instruments" National Standard
- JJF1624-2017 "Digital Weighing Display (Weighing Indicator)" Type Evaluation Outline
- JJG649-2016 "Digital Weighing Display (Weighing Indicator)" Verification Regulation



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i. Basic Information

1.1 Features and Specifications

The AMC501-J is a loss-in-weight quantitative control instrument that supports batch settings and has bag clamping/loosening control functions. It automatically determines stability before starting the loss-in-weight control process and controls the feeding based on the hopper weight. It can store cumulative values of up to 15 digits, and 20 recipes each have separate cumulative data. The AMC501-J features a high-brightness color TFT touch screen, supports Chinese and English input and display, and has a beautiful graphical interface with reasonable functional classification and layout. These excellent features make the AMC501-J very easy to use.

The AMC501-J loss-in-weight controller has the following basic features:

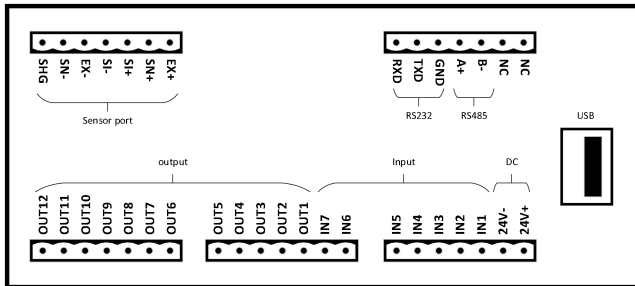
- TFT high-brightness color touch screen, supports Chinese and English input and display
- Weighing channel: Single channel
- Operating voltage: DC24V
- Sensor: DC5V/4-wire, 6-wire compatible
- Digital I/O: 7 inputs/12 outputs
- Installation method: Panel-mounted
- Dimensions: 203×149×50 (L×W×H, mm)

Detailed technical specifications are as follows:

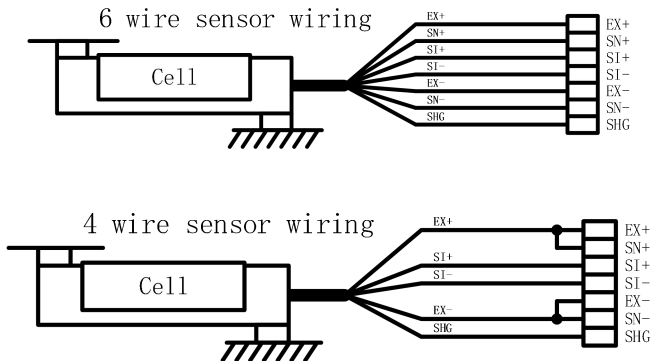
Sensor Excitation	DC5V±10%/120mA drive current/can connect up to 8 sensors with 350Ω specification
Sensor Sensitivity	2mV/V or 3mV/V
Input Signal Range	0 ~ 15mV
Input Sensitivity	0.5uV/d
Non-linearity	0.02%FS (at 3mV/V)
Zero Drift	< 0.5μV/°C
Gain Drift	< 10PPM/°C
AD Conversion Rate	960 times/second
Maximum Display Resolution	1/100000
Product Accuracy Class	
Operating Voltage	DC24V (18V ~ 30V compatible)
Power Consumption	< 5W
Operating Temperature	-10°C ~ 45°C
Storage Temperature	-20°C ~ 60°C
Humidity	Within 90%RH (no condensation)

1.2 Wiring Ports

The wiring ports are shown in the following diagram:

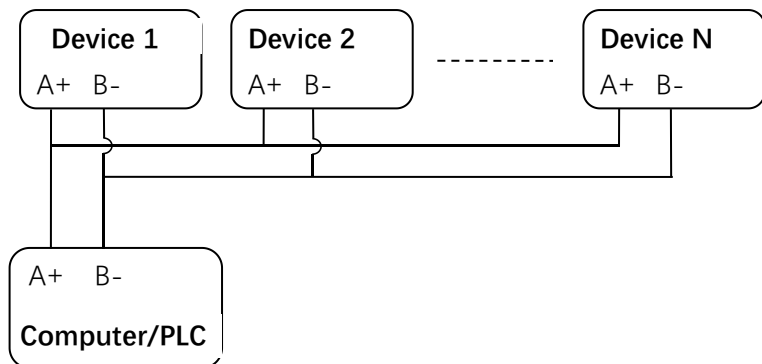


1.3 Sensor Wiring Method

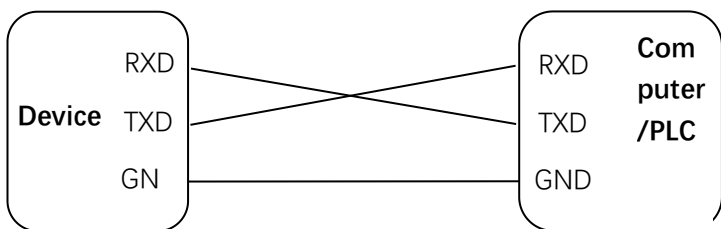


1.4 Serial Port Wiring Method

RS485 Wiring Diagram :

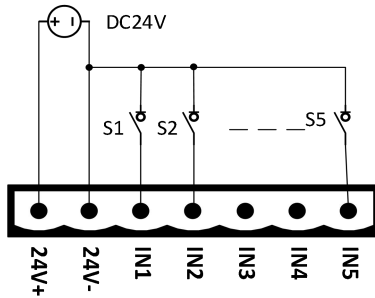


RS232 Wiring Diagram :



1.5 Digital Input/Output Wiring Method

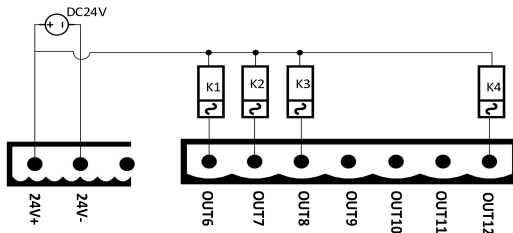
The wiring diagram for digital input is shown below (using IN1, IN2, and IN5 as examples):



External circuits driving digital inputs must meet two requirements:

1. The external circuit must share a common ground with the controller.
2. When the external circuit inputs a low level, it indicates a valid input; otherwise, it indicates an invalid input.

The wiring diagram for digital output is shown below (using OUT6, OUT7, OUT8, and OUT12 as examples):



External circuits driven by digital outputs must meet two requirements:

1. The external circuit must share a common ground with the controller.
2. When the digital output is valid, it outputs a low level.

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

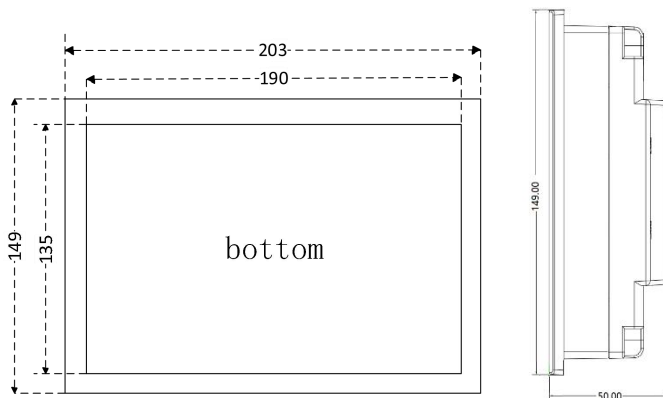
1.6 Interface Definitions

Interface	Description	Interface	Description
24V+	DC24V power positive	24V-	DC24V power negative
Digital Input			
IN1	I1. Start	IN2	I2. Stop
IN3	I3. Pause	IN4	I4. Clear
IN5	I5. Clear Alarm	IN6	I6. Clamp/Loosen Bag
IN7	I7. Switch Recipe		
Digital Output			
OUT1	Q1. Running	OUT2	Q2. Stopped
OUT3	Q3. Fast Feed	OUT4	Q4. Med Feed
OUT5	Q5. Slow Feed	OUT6	Q6. Fixed Value
OUT7	Q7. Over/Under Difference	OUT8	Q8. Alarm
OUT9	Q9. Clamp Bag	OUT10	Q10. Material Shortage
OUT11	Q11. Batch Complete	OUT12	Q12. Flap
Sensor Interface			
EX+	Sensor excitation positive	EX-	Sensor excitation negative
SN+	Sensor sensing positive	SN-	Sensor sensing negative
SI+	Sensor signal positive	SI-	Sensor signal negative

Interface	Description	Interface	Description
SHG	Sensor shield wire		

1.7 Installation Dimensions

Data unit: mm



Bottom view of the product/ Side view of the product

Recommended installation opening size: 192mm×138mm

ii. Main Interface

After powering on and completing the startup, the main interface will be displayed as shown below:



The top bar displays the current weight value, total hopper weight, weight stability, zero point status flags, and the detailed operation steps of the controller.

The middle two bars display the following information:

- Recipe: Displays the currently selected recipe number and name. Click to select a recipe.
- Target : The target loss-in-weight value for the current recipe.
- Last Res: The weight of the last completed loss-in-weight operation.
- Warring: Displays alarm information when an alarm is triggered. Click to clear the alarm.
- batch: The number of loss-in-weight operations to be performed. The controller will automatically stop after completing the set number of batches.

- Completed Batches: The number of batches already completed.
- Acc. Nums :The total number of bags completed in loss-in-weight operations.
- Acc. Wt : The total weight completed in loss-in-weight operations.

Note: Clicking on the cumulative data display area will clear the cumulative data.

The bottom bar contains function buttons for partial parameter settings and operations.

- F1 System setting: Enters the system maintenance main interface.
- F2 Shortcut: Enters the quick settings interface.
- F3 Clr Alarm: Clears the alarm when an alarm is triggered.
- F4 Zero: Performs a zero operation on the current weight. The button is grayed out when unavailable, such as during operation.
- F5 clamp/unclamp: Click to turn the discharge signal on or off.
- F6 Manual override: Allows manual control of fast, Med, and slow feeds, pause, etc., and displays the real-time status of digital I/O ports.

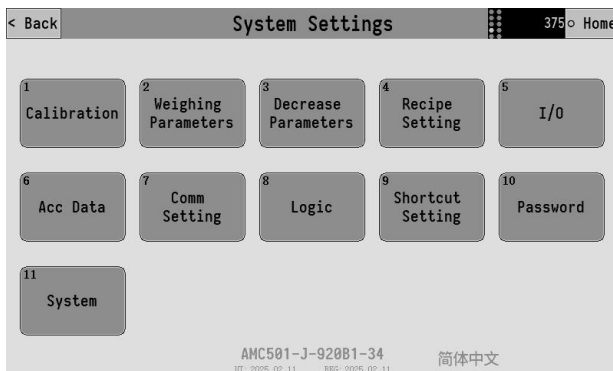
Note: When paused, F6 Manual Operation will display as F6 Continue Running. Click to continue running.

- F7 Start: Grayed out indicates the stop state. Click to start running. If no errors are reported, the system will start the loss-in-weight workflow.

iii. System Maintenance

Click System Maintenance on the main interface to enter the system maintenance main menu interface, as shown below:

(Initial system maintenance password: 000000)



This interface lists all parameter setting options for the controller. The bottom of the screen displays the controller model and software date. Click the English and Simplified Chinese buttons in the lower right corner to switch between Chinese and English display.

The following sections provide detailed explanations of each major item in system maintenance.

3.1 Weight Calibration

New equipment needs to be calibrated for weight before use, and system parameters such as unit, decimal point, minimum division, and maximum range need to be set.

There are three methods of weight calibration, and any one of them can be selected based on actual conditions:

1. Calibration with Weights: Use weights or objects of known weight placed on the scale for calibration.
2. Calibration without Weights: Directly input the zero voltage value, gain voltage value, and corresponding weight for calibration.

3.1.1 Calibration with Weights

The screenshot displays a software interface for calibration. At the top, there are navigation buttons: "< Back" on the left and "Home" on the right. The main title is "1.Calibration". Below the title, there are two main sections. On the left, there are two buttons: "Wt Clb" (selected) and "No Wt Clb". To the right of these buttons is a table of settings:

1.1.1	Unit	kg	>
1.1.2	Accuracy	0	>
1.1.3	Division Value	1	>
1.1.4	Capacity	100000	kg

On the right side of the interface, there is a large display area. At the top, it says "Weight". Below that, a large black box displays the number "375". Underneath this, it shows "Sensor Voltage: 0.589 mV" and "Gain Voltage: 0.586 mV". At the bottom of this section, there are two buttons: "Zero Clb" and "Gain Clb".

The sensor voltage displayed in the right column refers to the current sensor voltage value. The normal range for this value is 0 ~ 15mV. If the value exceeds this range, it indicates an abnormal signal from the weight sensor. Check if the sensor is damaged or if the wiring connection is normal and reliable.

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

1. Empty the scale and wait for the signal to stabilize (absolute voltage does not fluctuate). Click the Zero

Calibration button. A successful zero calibration will prompt a message.

2. Place the weight or an object of known weight on the scale and wait for the signal to stabilize (absolute voltage does not fluctuate). Click the Weight Calibration button. An input box will pop up. Enter the accurate weight of the object and click Confirm. A successful weight calibration will prompt a message.

After completing the above two steps, the weight calibration process is complete, and the controller will display the accurate weight value on the scale.

3.1.2 Calibration without Weights

The screenshot shows a user interface 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. The main area of the interface contains three input fields: "1.2.1 Zero Voltage" with the value "0.003" and unit "mV", "1.2.2 Gain Voltage" with the value "3.125" and unit "mV", and "1.2.3 Gain Weight" with the value "2000" and unit "kg". To the right of these fields is a large black display showing the number "375" in white. Below the display is a button labeled "Calib".

In this interface, you can input the zero voltage, gain voltage, and corresponding gain weight. Click Calibrate to complete the calibration process without weights.

3.2 Basic Weighing Parameters

Click 2. Basic Weighing Parameters in the system maintenance interface to enter the basic weighing parameter settings interface, as shown below:

< Back

2.Weighing Parameters

375 Home

2.1 Weighing

2.1.1 Zero Tracking0d

2.1.2 Zero Range50%

2.1.3 Stab. Range1d

2.1.4 Stab. Time0.5s

2.1.5 Weighing Filter3

2.1.6 Zero On StartupOFF

2.1.1	Zero Tracking	0 ~ 9d Only works in the stop state. When the weight value is stable within this setting value ×d (minimum division value), the system will automatically perform a zero operation.	
2.1.2	Zero Range	0 ~ 99%When performing a zero operation, the weight must be less than or equal to "maximum range × zero range" to allow zeroing.	
2.1.3	Stab. Range	1-9d	values within the "stability judgment time". If the difference between the maximum and minimum values is ≤ "stability judgment range", the weight is considered stable.
2.1.4	Stab. Time	0.1~9.9s	
2.1.5	Weighing Filter	0 ~ 9,The strength level of the software digital filter. Set the appropriate filter level parameter	

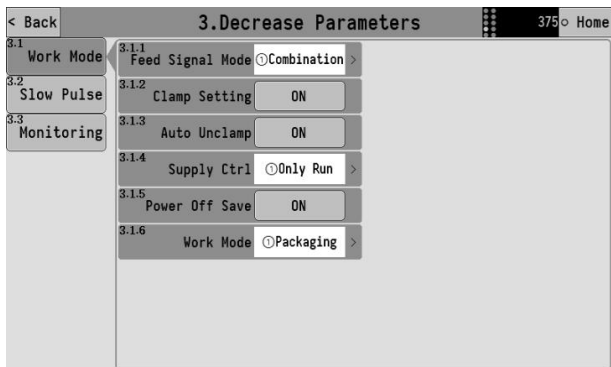
		based on the actual debugging effect of the equipment. 0: Weakest filter effect, fast weight response, poor anti-vibration effect; 9: Strongest filter effect, slow weight response, good anti-vibration effect.
2.1.6	Zero on startup	On/Off, When turned on, the controller will automatically perform a zero operation every time it is powered on.

3.3 Loss-in-Weighing Parameters

Click 3. Loss-in-Weighing Parameters in the system maintenance interface to enter the loss-in-weighing parameter settings interface. The parameters are divided into several categories based on function and control flow.

3.3.1 Work mode

You can set the working mode-related function parameters of the loss-in-weighing scale.

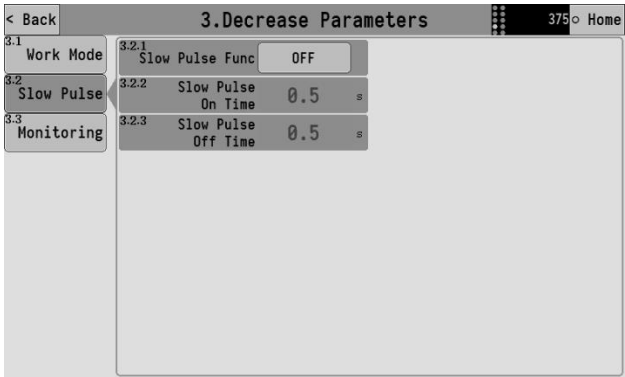


3.1.1	Feed Signal Mode	①[Combined]: Fast:, Med, and slow feed signals are output. Med: Med and slow feed signals are output. Slow: Only slow feed signal is output. ②[Independent]: Fast: Fast feed signal is output. Med: Med feed signal is output. Slow: Slow feed signal is output.
3.1.2	Clamp setting	Set whether there is a bag clamping device. ①[ON]: Before starting the loss
3.1.3	Auto unclamp	Set whether to automatically release the bag. ① [ON]: The controller automatically releases the bag after the reduction process ends. ② [OFF]: After the reduction process ends, an external manual signal is required to release the bag and complete the reduction process. Note: This function only works when the 3.1.2 Bag Clamping Device is enabled.
3.1.4	supply Ctr	① [Only Run]: Determines whether feeding is needed only after operation starts. ② [run &stop]: Determines whether feeding is needed in any state after startup.
3.1.5	Power-off Save	Power-off save function. ① [ON]: If power is lost unexpectedly during the reduction process, the controller will continue the previous reduction process after power is restored. ② [OFF]: The controller will not continue the previous reduction process after power is restored.

3.1.6	Work Mode	① [Packaging]: Starts once, runs continuously, and continues after one packaging cycle is completed. The bag clamping device can be configured. ② [Batching]: Starts once, runs once, and stops after one batching cycle is completed. Feeding is not allowed during startup, and there is no bag clamping device.
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3.3.2 Slow Feed Pulse

The slow feed pulse function controls the slow feed output signal in a pulse mode to control feeding.



3.2.1	slow pulse func	① [ON]: The "Q5 Slow Feed" signal will be output in pulse mode. ② [OFF]: The "Q5 Slow Feed" signal will be output in normal level mode. **Note**: The slow feed pulse function only works during the slow feeding process (when only the slow feed signal is output).
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< Back
3.Decrease Parameters
375 Home

3.1 Work Mode

3.2 Slow Pulse

3.3 Monitoring

3.3.1 Supply Monitor s

3.3.2 Pause Supply Over Time

3.3.3 Decrease Monitor s

3.3.4 Pause Decrease Over Time

3.3.1	supply Monitor	0~999s,When the feeding time exceeds the set feeding timeout monitoring time, the controller will output a feeding timeout alarm. **Note**: Setting the feeding timeout monitoring to 0 disables the feeding monitoring function
3.3.2	Pause supply over time	Set whether to pause feeding when a feeding timeout occurs. ① [ON]: Pause feeding when a feeding timeout occurs. ② [OFF]: Continue feeding when a feeding timeout occurs.
3.3.3	Decrease monitor	0~999s ,When the reduction time exceeds the set reduction timeout monitoring time, the controller will output a reduction timeout alarm. *Note*: Setting the reduction timeout monitoring to 0 disables the reduction monitoring function.

3.3.4	Pause decrease over time	Set whether to pause reduction when a reduction timeout occurs. ① [ON]: Pause reduction when a reduction timeout occurs. ② [OFF]: Continue reduction when a reduction timeout occurs.
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3.4 Recipe Parameters

The controller has 20 sets of recipe parameters that can be configured. Users can set up commonly used recipe parameters in advance and switch to the corresponding recipe when needed.

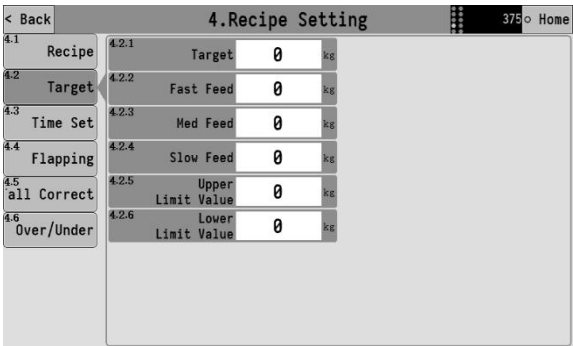
3.4.1 Recipe

4.1.1	Selected Recipe	Set the currently used recipe number
4.1.2	Enable choose	When ON, the recipe will be selectable when clicking the recipe number position on the main interface.

4.1.3	Recipe Name	Enter the recipe name for easy memorization. After setting, the recipe name will be displayed at the recipe number position on the main interface.
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3.4.2 Target Value

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

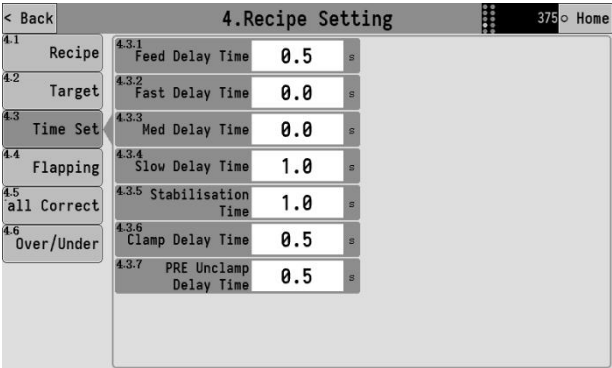


4.2.1	Target	Set the target weight for the reduction process.
4.2.2	Fast Feed	During reduction, when the weight value $\geq$ target value - fast feed advance, the fast feed is turned off. **Note**: Setting this to 0 means the fast feed output process is not activated
4.2.3	Med Feed	During reduction, when the weight value $\geq$ target value - Med feed advance, the Med feed is turned off.

		Note: Setting this to 0 means the Med feed output process is not activated.
4.2.4	Slow Feed	During reduction, when the weight value $\geq$ target value - slow feed drop value, the slow feed is turned off.
4.2.5	Upper Limit Value	Set the feeding function. The upper and lower limit values control feeding. Feeding starts when the weight is below the lower limit and stops when the weight exceeds the upper limit.
4.2.6	Lower Limit Value*	

3.4.3 Time Settings

Set the relevant time parameters during the reduction process.



4.3.1	Feed Delay time	0.0~99.9s,The delay time before feeding starts.
4.3.2	Fast delay time	0.0~99.9s ,The vibration elimination time at the start of the fast feed. During this time, the fast feed signal remains valid regardless

		of weight. After this time, the weight is compared to the fast feed advance to end the fast feed.
4.3.3	Med delay time	0.0~99.9s, The vibration elimination time at the start of the Med feed. During this time, the Med feed signal remains valid regardless of weight. After this time, the weight is compared to the Med feed advance to end the Med feed.
4.3.4	Slow delay time	0.0~99.9s ,The vibration elimination time at the start of the slow feed. During this time, the slow feed signal remains valid regardless of weight. After this time, the weight is compared to the slow feed drop value to end the slow feed.
4.3.5	stabilization time	0.0~99.9s, The waiting time after the reduction is completed. After this time, the current weight is recorded as the reduction result.
4.3.6	Clamp Delay Time	0.0~99.9s ,After the "Q9 Bag Clamping" signal is output, this delay time is waited before considering the bag clamping action complete and proceeding with the next steps.
4.3.7	Pre-unclamp Delay Time	0.0~99.9s, The delay time before automatic bag release

3.4.4 Flap Settings

Set the flap action-related functions.

< Back

4.Recipe Setting

375 Home

4.1 Recipe

4.2 Target

4.3 Time Set

4.4 Flapping

4.5 all Correct

4.6 Over/Under

4.4.1 Flap Mode OFF

4.4.2 Flap Start Delay 0.5 s

4.4.3 Flap On Time 0.5 s

4.4.4 Flap Off Time 0.5 s

4.4.5 Flap Times When Dec 0

4.4.6 Flap Start Weight 0 kg

4.4.7 Flap Times After Dec 1

4.4.8 Ext Flap Time 0.0 s

4.4.1	flap Mode	Set the flap function. ① [ON]: Enable flap. ② [OFF]: Disable flap.
4.4.2	flap Start Delay	0.0~99.9s,The delay time before the flap function starts.
4.4.3	Flap on time	0.0~99.9s ,The active time for the flap output pulse signal.
4.4.4	Flap off time	0.0~99.9s,The inactive time for the flap output pulse signal.
4.4.5	Flap time when Dec	During Reduction0~99 The maximum number of bag taps allowed during the reduction process. If the reduction process completes before the tapping count is reached, the flap during reduction stops.

		Note: Setting this to 0 disables the flap during reduction.
4.4.6	flap Start Weight	If the flap during reduction is enabled, the flap process starts when the reduction weight value is greater than the flap start weight.
4.4.7	Flap time After Dec	0~99.The number of bag taps after the reduction is completed. **Note**: Setting this to 0 disables the flap after reduction.
4.4.8	Ext flap time	0.0~99.9s.The additional time for the flap signal output after the flap count is completed. This time starts simultaneously with the

3.4.4.1 Detailed Explanation of Flap Function

The flap function is only effective when 3.1.6 Working Mode is set to ① [Packaging Mode] and 3.1.2 Bag Clamping Device is enabled. Below is an example of the signal timing for flap during and after reduction in packaging mode.

4.5.2	fall Correct times	0~99 ,When the reduction count equals the drop correction count, a drop correction is performed.
4.5.3	Fall Correct Range	0.0~9.9 ,The percentage of the target value. Target differences within this range will be used for drop correction, while those outside this range will not.
4.5.4	Fall Correct depth	The magnitude of each drop correction ① 25%/② 50%/③ 100%

3.4.5.1 Detailed Explanation of Drop Correction Function

In some cases, the drop correction function may be needed to improve reduction accuracy. The drop correction function continuously adjusts the slow feed advance during operation. The principle is as follows:

1. Target difference = Current weighing result - Target value.
2. Average target difference = (Target difference 1 + Target difference 2 + ... + Target difference drop correction count) / Drop correction count.
3. New slow feed drop = Previous slow feed drop + Average target difference × Drop correction magnitude.

3.4.6 Over/Under Difference Detection

Over/Under difference refers to the combined term for over-difference and under-difference. During the reduction process, if the reduction result is higher than the target value by a certain range, it is considered an over-difference. If it is lower than the

target value by a certain range, it is considered an under-difference. This range is set according to production requirements.

The screenshot shows a control panel interface for '4.Recipe Setting'. On the left is a vertical menu with options: 4.1 Recipe, 4.2 Target, 4.3 Time Set, 4.4 Flapping, 4.5 all Correct, and 4.6 Over/Under. The main area displays settings for the selected '4.6 Over/Under' option. These settings include: 4.6.1 Over/Under Func set to OFF; 4.6.2 Check Delay Time set to 1.0 s; 4.6.3 Over Tolerance set to 0 kg; 4.6.4 Under Tolerance set to 0 kg; 4.6.5 Over/Under Pause set to OFF; and 4.6.6 Over/Under Alarm Time set to 2.0 s.

4.6.1	Over/Under Func	① [ON]/② [OFF] After each reduction, the reduction result will be checked for over/under difference.
4.6.2	Check delay time	0.0~99.9s,After the reduction ends, this delay time is waited before the current weight stabilizes and over/under difference detection is performed.
4.6.3	Over tolerance	During over/under difference detection, if the reduction result > target value + over-difference value, it is judged as an over-difference
4.6.4	Under tolerance	During over/under difference detection, if the reduction result < target value - under-difference value, it is judged as an under-difference.

4.6.5	Over/Under Pause	① [OFF]/② [ON]: When an over/under difference occurs, the controller will alarm and wait for user intervention. After clearing the alarm, the operation continues. Alternatively, the "I2 Stop" signal can be given to return to the stop state for processing
4.6.6	Over/Under Alarm Time	0.0~99.9s, When an over/under difference occurs, the system will output an alarm signal. The duration of this alarm signal is the over/under difference alarm time. After this time, the alarm signal is automatically cleared

3.5 Digital I/O

Define the functions corresponding to the digital input and output ports, and use the digital I/O test function to test whether the external digital I/O lines are normal.

3.5.1 Input Definition

Define the functions corresponding to the digital input ports IN1~IN7. Click the digital input port to be set, and select the function to be defined from the pop-up option box.



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

No.	Function Name	Description
I0	Undefined	No function defined.
I1	Start	Start operation.
I2	Stop	Stop operation.
I3	Pause	Pause operation.
I4	zero	Perform a clear operation.
I5	Clr Alarm	Clear the alarm status.
I6	Clamp/unclamp	Input signal for clamp/release bag operation.
I7	choose Recipe	Input valid once, switch to the next recipe with a non-zero target value.
I8	Slow Stop	Enter slow stop process, automatically stop after completing the current pack.
I9	Manual Slow Feed	Enable slow feed when valid, disable when valid again.
I10	Manual Med Feed	Enable Med feed when valid, disable when valid again.
I11	Manual Fast Feed	Enable fast feed when valid, disable when valid again.
I12	Clear Total Accumulated	Clear total accumulated data.
I13	Clear Recipe Accumulated	Clear current recipe accumulated data.
I14	Start/Stop	Valid to start, invalid to stop (level).
I15	Start/Pause	Valid to start, invalid to pause (level).
I16	Start/Slow Stop	Valid to start, invalid to slow stop (level).

I17	Manual Slow Feed (Level)	Enable slow feed when valid, disable when invalid.
I18	Manual Med Feed (Level)	Enable medium feed when valid, disable when invalid.
I19	Manual Fast Feed (Level)	Enable fast feed when valid, disable when invalid.
I20	End	End the reduction process.
I21	Manual Feeding	Change feeding output when valid (valid/invalid -> invalid/valid). Note: Only valid during stop or pre-reduction phase.

3.5.2 Output Definitions

Define the functions corresponding to the digital output ports OUT1~OUT12. Click the digital output port to be set, and select the function to be defined in the pop-up option box.



The list of available functions for digital outputs is as follows:

No.	Function Name	Description
Q0	Undefined	No function defined.
Q1	Running	Output valid when in running state.
Q2	Stop	Output valid when in stopped state.
Q3	fast	Control signal for fast feeding.
Q4	Med	Control signal for medium feeding.
Q5	Slow	Control signal for slow feeding.
Q6	Fixed Value	Output valid when reduction is completed, indicating the reduction is done. The duration can be set in parameter [4.3.5 Fixed Value Hold].
Q7	Over/Under	Output valid when over/under difference alarm occurs during feeding.
Q8	warning	Output valid when the controller has an alarm.
Q9	Clamp Bag	Control signal for bag clamping mechanism. Valid to clamp, invalid to release.
Q10	Supply fill	Output signal for material shortage state.
Q11	Batch Completed	Output valid when batch is completed.
Q12	flap	Control signal for flap function. For detailed function, refer to section 3.4.4.1.
Q13	Paused	Output valid when in paused state.
Q14	Slow Stop	Output valid when in slow stop state.
Q15	Upper Limit	Output valid when weight exceeds the upper limit.

Q16	Lower Limit	Output valid when weight is below the lower limit.
Q17	Logic Output 1	Output signal for logic programming 1.
Q18	Logic Output 2	Output signal for logic programming 2.
Q19	Logic Output 3	Output signal for logic programming 3.
Q20	Logic Output 4	Output signal for logic programming 4.
Q21	Logic Output 5	Output signal for logic programming 5.
Q22	Logic Output 6	Output signal for logic programming 6.

3.5.3 Digital I/O Test

The digital I/O test is used to test whether the input and output digital ports are working properly. The interface is shown below:



Digital Output Test:

The OUT1~OUT12 buttons are used to test the digital output functions. Gray indicates the digital output is invalid, green indicates the digital output is valid.

For example:

If the OUT3 output port is connected to a relay, to test if the OUT3 output is working properly, click the OUT3 button to switch the output state to valid. If the circuit is normal, the relay connected to OUT3 should engage. Click the OUT3 button again to switch the output state to invalid. If the circuit is normal, the relay should disengage.

Digital Input Test:

IN1~IN7 are used to test the digital input functions. Gray indicates the digital input is invalid, green indicates the digital input is valid.

For example:

If the IN1 input port is connected to a button switch, to test if the button switch is working properly, manually press the connected button. If the circuit is normal, the IN1 indicator should turn green. Release the button, and if the circuit is normal, the IN1 indicator should turn gray.

3.6 Accumulated Data

View the controller's batch and accumulated data, as well as historical data.

3.6.1 Batch and Accumulated Data

View the controller's accumulated values and set the number of batches to run. The interface is shown below:

< Back
6.Acc Data
375 Home

6.1 Bat&Acc.

6.2 History Data

Acc. Nums: 0
Acc. Wt : 0 kg

Rec. Acc.

Rec.	Acc. Nums	Acc. Weight
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0

6.1.1 Batch Set 0

6.1.2 Completed 0

6.1.3 Manual Disc Acc OFF

Clr All Acc.

Clr Acc.

Clr Rec. Acc.

Clr Sel. Rec

USB Export

6.1.1	Batch Set	Set the number of packs. When the number of runs reaches the set batch number, the reduction process will stop and an alarm will be triggered. Set to 0 to disable this function.
6.1.2	Completed	If the batch number is set, this item will display the number of batches completed.
6.1.3	Manual Disc Acc	Set whether the weight of manual feeding is counted in the accumulated data. ① Not Counted/② Counted

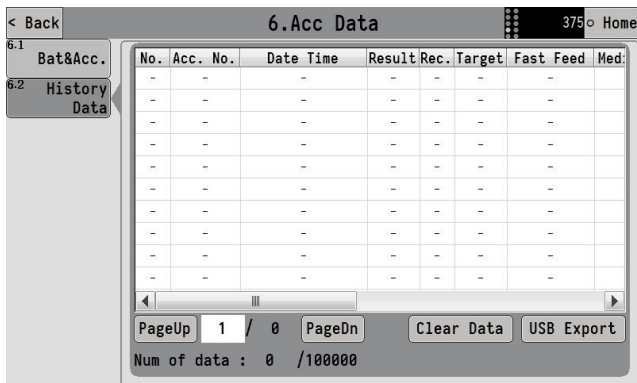
When a USB drive is inserted, the accumulated data file can be exported to the USB drive in CSV format.

3.6.2 Historical Data

View the packaging historical data, including accumulated packs, date, results, recipe parameter settings, and packaging time.

The controller can store up to 100,000 historical data entries. When the storage space is full, it will start overwriting from entry 1.

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



3.7 Communication Interface

The controller can be equipped with two completely independent serial communication interfaces, RS232 and RS485, each with configurable communication parameters.

3.7.1 RS232 Settings

Set the relevant parameters for the RS232 communication port.

< Back
7.Comm Setting
375 Home

7.1 RS232

7.2 RS485

7.1.1 Slave ID

7.1.2 Protocol ① Modbus-RTU-H >

7.1.3 Baudrate ③ 38400 >

7.1.4 Data Format ③ 8-N-1 >

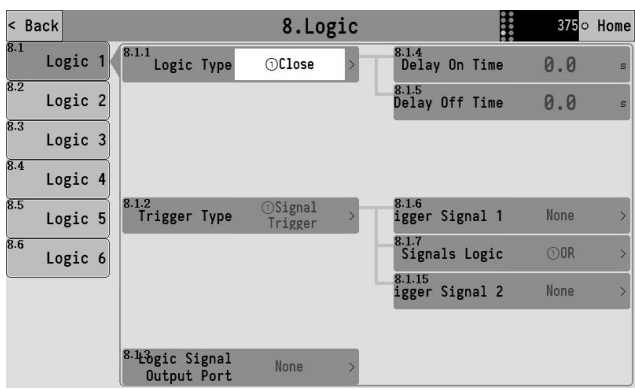
7.1.1	Slave ID	Set the device's communication address (slave number).
7.1.2	Protocol	① [Modbus-RTU-H]: Modbus-RTU communication protocol (high word first for double-word data). ② [Modbus-RTU-L]: Modbus-RTU communication protocol (low word first for double-word data).
7.1.3	Baud rate	Set the baud rate for serial communication.
7.1.4	Data Format	① [7-E-1]: 7 data bits, even parity, 1 stop bit ② [7-O-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-O-1]: 8 data bits, odd parity, 1 stop bit

3.7.1 RS485 Settings

Refer to section 3.7.1 RS232 Settings for setup method.

3.8 Logic Programming

The controller supports 6 channels of logic programming. When the existing functions of the controller cannot meet the control requirements of the equipment, you can try using the logic programming function to define auxiliary logic output signals outside the controller's operation process to control the equipment, The logic programming setup interface is as follows:



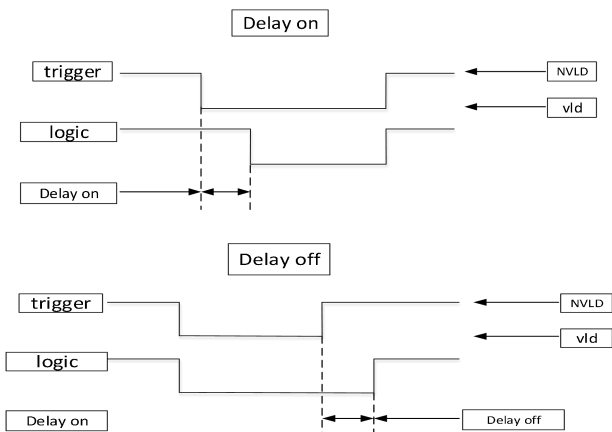
Below is an explanation of the parameters for Logic Programming 1 as an example.

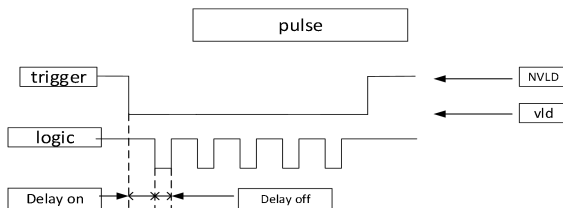
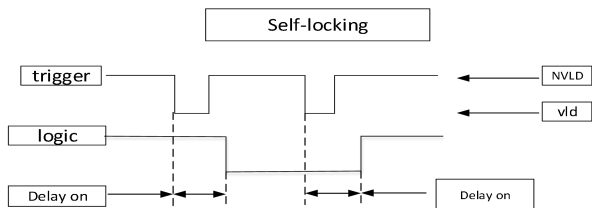
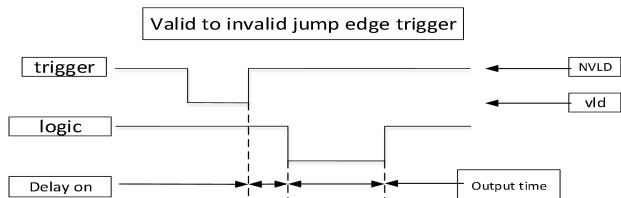
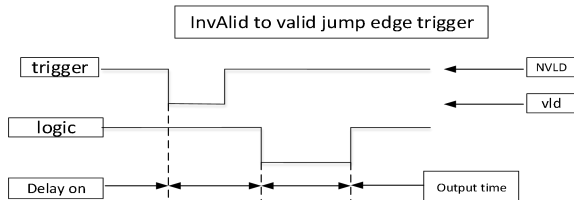
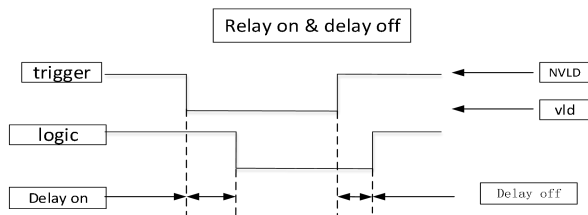
8.1.1	Logic Type	Select the type of logic programming. ① [Off]: Disable this logic output function. ② [Delay On] ③ [Delay Off] ④ [Delay On and Delay Off] ⑤ [Valid-Invalid Edge Trigger] ⑥ [Invalid-Valid Edge Trigger] ⑦ [Latch] ⑧ [Pulse] Refer to the corresponding function description for details3.8.1
8.1.2	Trigger Type	① [Signal Trigger]: Trigger the logic output through a signal. ② [Condition Trigger]: Trigger the logic output when a condition is met.
8.1.3	Logic signal Output Port	Select the OUT output port to define this logic output signal.
8.1.4	Delay On Time	The delay time for the logic output signal to turn on.
8.1.5	Delay Off Time	The delay time for the logic output signal to turn off.
8.1.6	Trigger Signal 1	Select the signal 1 to trigger the logic output.

8.1.7	Signal Logic	Select the logical relationship between trigger signal 1 and trigger signal 2. 1. [OR]: Trigger signal 1 or trigger signal 2 can trigger the logic output. 2. [AND]: Both trigger signal 1 and trigger signal 2 need to be valid to trigger the logic output. 3. [XOR]: Trigger signal 1 and trigger signal 2 must be different to trigger the logic output.
8.1.8	Output Time	When [10.1.1 Logic Type] is set to item 5/6, this parameter can be set. The valid time for the logic output signal after triggering. Time ends the logic output.
		If this time is set to 0, the logic output signal can only be ended by a reset signal.
8.1.9	Init Signal	When [10.1.1 Logic Type] is set to item 5/6, this parameter can be set. The reset signal can reset the logic output, making the logic output signal invalid and ending the logic output process.
8.1.10	Init Signal type	1. [Valid Reset]: Reset the logic output when the reset signal is valid. 2. [Invalid Reset]: Reset the logic output when the reset signal is invalid. 3. [Invalid-Valid Edge Reset]: Reset the logic output when the reset signal changes from invalid to valid. 4. [Valid-Invalid Edge Reset]: Reset the logic output when the reset signal changes from valid to invalid.

8.1.11	Trigger Condition	Select the condition to trigger the logic output. 1. [Weight Greater Than Set Value] 2. [Weight Less Than Set Value] 3. [Weight Within Range] 4. [Weight Outside Range]
8.1.12	Set Value 1	Set the weight value for the corresponding trigger condition.
8.1.13	Set Value 2	
8.1.14	Need Stable	1. [ON]: The weight must be stable after meeting the trigger condition to trigger the logic output. 2. [OFF]: The logic output can be triggered as soon as the weight meets the trigger condition, no need to be stable.
8.1.15	Trigger Signal 2	Select the signal 2 to trigger the logic output.

3.8.1 Logic Output Timing Diagram





Example

Implement a marking function through logic programming: After the bag clamping output signal is valid, delay for 1 second, then output OUT12 for 2 seconds to control the marking machine to print the code on the bag after the bag clamping is completed.

Setup as follows:

[8.1.1 Logic Type]: Invalid-Valid Edge Trigger

[8.1.2 Trigger Type]: Signal Trigger

[8.1.6 Trigger Signal 1 Setup]: Clamp Bag

By combining different trigger signals, trigger conditions, and logic programming signals, very flexible logic signals can be output.

For example, to implement the following logic: Real-time detection of weight above 100kg outputs OUT10 for alarm indication. After the alarm is valid, delay for 2 seconds, output OUT11 for 3 seconds to control the reduction mechanism to discharge the material.

Setup as follows:

Logic Programming 1: Implement detection of weight above 100kg and output OUT10.

[8.1.1 Logic Type]: Delay On

[8.1.2 Trigger Type]: Condition Trigger

[8.1.11 Trigger Condition Setup]: Weight Greater Than Set Value

Logic Programming 2: Implement OUT10 valid after 2 seconds delay, output OUT11 for 3 seconds.

[8.1.1 Logic Type]: Invalid-Valid Edge Trigger

[8.1.2 Trigger Type]: Signal Trigger

[8.1.6 Trigger Signal 1 Setup]: Logic Output 1

3.9 Quick Interface Configuration

The quick interface configuration function allows you to configure the parameters displayed in the quick setup interface (accessed by clicking Quick Setup on the main interface).

The quick interface can display up to 4 pages, Quick 1~4, where Quick 2~4 can be selected via checkboxes in the interface. The selected interface will be displayed in the quick setup interface. Each page of the quick setup can display up to 16 parameters. Click the corresponding option box to select the parameters to be displayed in the quick interface.

The quick interface configuration is shown below:

< Back		9.Shortcut Setting		375 Home	
9.1 Shortcut1	9.1.1 Para 1	4.2.1 Target	>	9.1.9 Para 9	6.1.1 Batch Set >
9.2 Shortcut2	9.1.2 Para 2	4.2.2 Fast Feed	>	9.1.10 Para 10	None >
9.3 Shortcut3	9.1.3 Para 3	4.2.3 Med Feed	>	9.1.11 Para 11	None >
9.4 Shortcut4	9.1.4 Para 4	4.2.4 Slow Feed	>	9.1.12 Para 12	None >
	9.1.5 Para 5	4.2.5 Upper Limit Value	>	9.1.13 Para 13	None >
	9.1.6 Para 6	4.2.6 Lower Limit Value	>	9.1.14 Para 14	None >
	9.1.7 Para 7	None	>	9.1.15 Para 15	None >
	9.1.8 Para 8	None	>	9.1.16 Para 16	None >

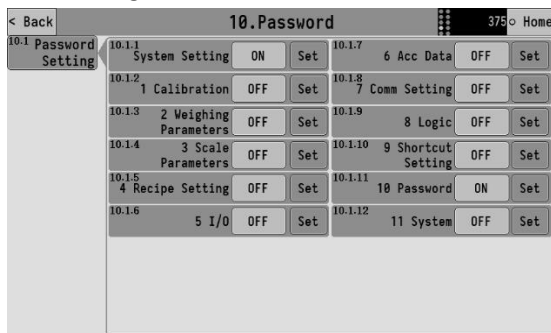
3.10 Password Management

The system maintenance button on the main interface and items 1~12 in the system maintenance menu interface can each have a separate password and password switch.

The default password for all items is: 000000.

When modifying the password, enter it twice and click confirm to complete the modification.

The password management interface is as follows:



3.11 System

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

3.11.1 Parameter Reset

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

< Back		11.System		375 Home	
11.1	Para. Reset	11.1.1	All Parameters	Reset	
11.2	Date/Time	11.1.2	1 Calibration	Reset	
11.3	Register	11.1.3	2 Weighing Parameters	Reset	
11.4	Backup Recover	11.1.4	3 Scale Parameters	Reset	
11.5	Import Export	11.1.5	4 Recipe Setting	Reset	
		11.1.6	5 I/O	Reset	
		11.1.7	6 Acc Data	Reset	
		11.1.8	7 Comm Setting	Reset	
		11.1.9	8 Logic	Reset	
		11.1.10	9 Shortcut Setting	Reset	
		11.1.11	10 Password	Reset	

3.11.2 Time and Date

Modify the controller's time and date.

< Back		11.System		375 Home	
11.1	Para. Reset	2025-02-21(Fri)13:37:59 Year 2025 Hour 13 Mon 2 Min 37 Day 21 Sec 58 Write In			
11.2	Date/Time				
11.3	Register				
11.4	Backup Recover				
11.5	Import Export				

3.11.3 Product Registration

Product usage registration settings.

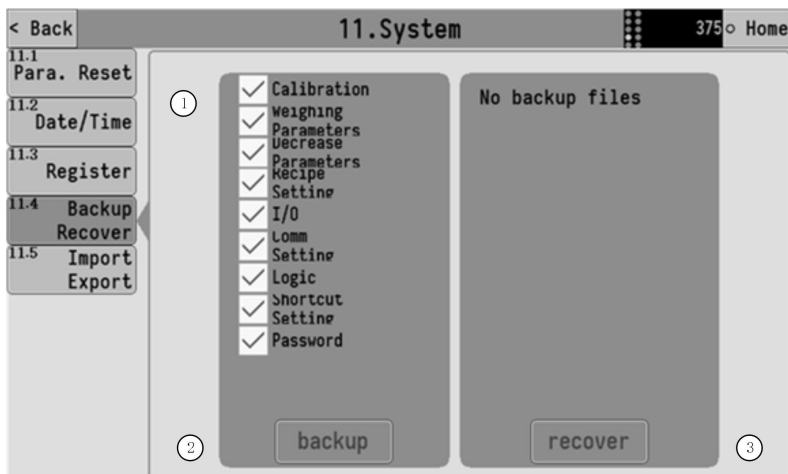


3.11.4 Parameter Backup and Restore

Backup the current parameter settings of the controller to the local memory, and restore them when needed.

On the left side, select the parameter items to be backed up. On the right side, it shows whether there is a backup file in the local memory and the date of the current backup file. You can delete the current backup file.

To prevent mis-operation, the backup and delete backup buttons are disabled by default when entering the parameter backup and restore interface. To enable the backup and delete backup functions, perform a special operation: click the position① shown below three times, then click the position② three times, and click the position ③three times again to enable the backup and delete backup functions.



3.11.5 Data Import and Export

The controller can export the current parameter settings to a USB drive in CSV format.

Data Export Operation:

On the left side of the interface, select the parameter items to be exported. Insert the USB drive and click USB Export to export the selected items to the USB drive.

Data Import Operation:

Insert the USB drive with the data file. The list on the right side of the interface will show the data files currently on the USB drive.

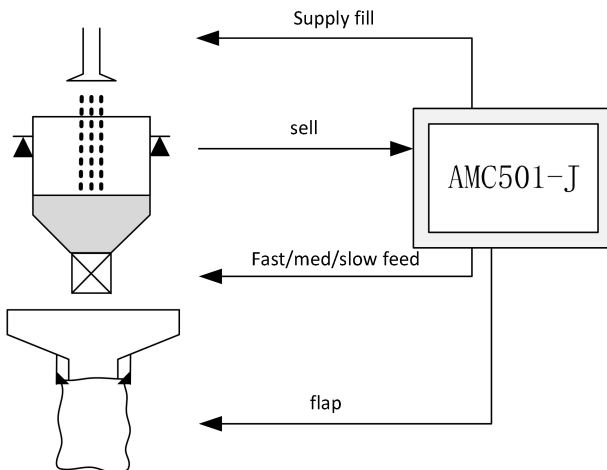
Select the data file to be imported and click USB Import.



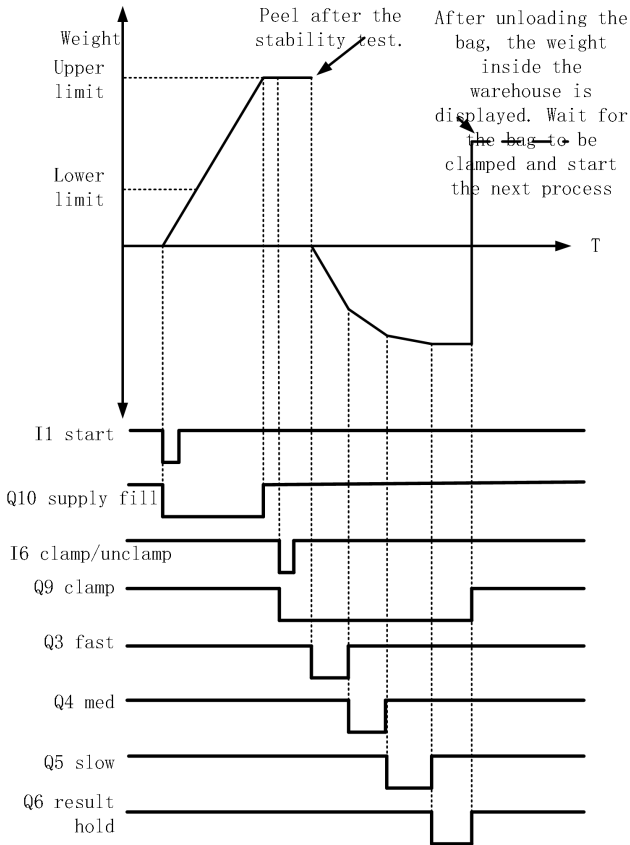
iv. Workflow and Function Description

4.1 Basic Structure of Loss-in-Weight Scale

The basic structure of the loss-in-weight scale is shown below:



4.2 Packaging Mode Workflow



Combined with the above figure, the basic workflow of the loss-in-weight scale in packaging mode is described as follows:

In the stopped state, if [3.1.4 Feeding Control] is set to ② Feed during both running and stopping, the controller will detect whether the material weight is below [4.2.6 Lower Limit]. If it is

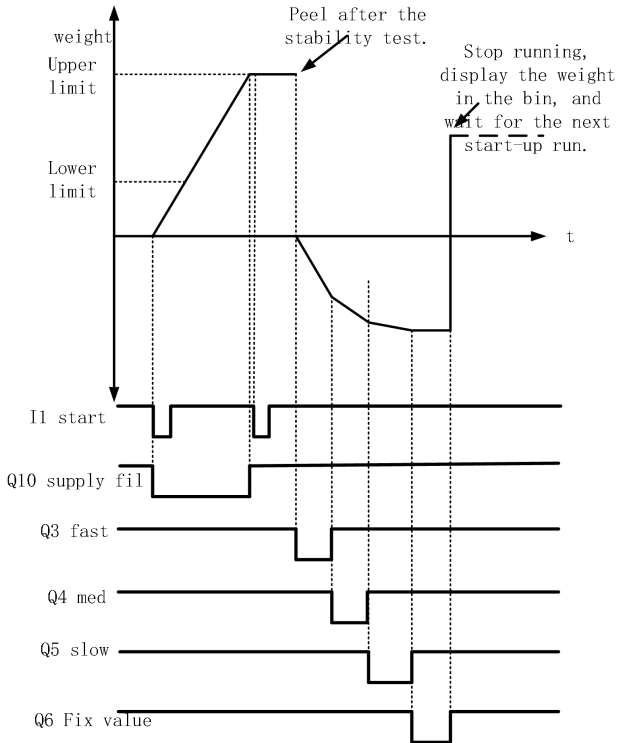
below the lower limit, the "Q10. Feeding" output signal will be activated to add material to the hopper until the weight reaches [4.2.5 Upper Limit], then stop feeding.

1. After starting, first check if the material weight is below [4.2.6 Lower Limit] and needs feeding. If feeding is needed, wait for feeding to complete.
2. If [3.1.2 Bag Clamping Device] is turned on, check if bag clamping is completed.
3. Start the [4.3.1 Pre-Feeding Delay] time. After the time is up, perform stability check and tare, then start the feeding process.
4. After starting fast feed, wait for a [4.3.2 Fast Feed Judgment Prohibition Time] before starting weight comparison.
5. Continuously collect weight and compare. When the weight value $\geq$ [4.2.1 Target Value] - [4.2.2 Fast Feed Advance], turn off "Q3. Fast Feed" and turn on "Q4. Med Feed".
6. After starting Med feed, wait for a [4.3.3 Med Feed Judgment Prohibition Time] before starting weight comparison.
7. Continuously collect weight and compare. When the weight value $\geq$ [4.2.1 Target Value] - [4.2.3 Med Feed Advance], turn off "Q4. Med Feed" and turn on "Q5. Slow Feed".
8. After starting slow feed, wait for a [4.3.4 Slow Feed Judgment Prohibition Time] before starting weight comparison.

9. Continuously collect weight and compare. When the weight value $\geq$ [4.2.1 Target Value] - [4.2.4 Slow Feed Drop], turn off "Q5. Slow Feed" and end feeding.
10. After feeding ends, if [4.6.1 Over/Under Difference Detection] is turned on, wait for a [4.6.2 Over/Under Difference Detection Delay] time. After the time is up, check system stability, then perform over/under difference detection. If over or under difference is detected, output an over/under difference alarm according to the settings, or directly pause.
11. After over/under difference detection ends, if [4.5.1 Drop Correction] is turned on, perform drop correction, then fixed value, wait for [4.3.5 Fixed Value Hold Time].
12. After the time is up, fixed value ends. At this time, record the total accumulated weight and start [4.3.7 Pre-Bag Release Delay Time]. After the delay ends, release the bag.
13. After bag release is completed, end this packaging process and wait for bag clamping to start the next process.

Note: The workflow does not include special functions such as over/under difference detection and flap. Please refer to the corresponding function chapters for details.

4.3 Batching Mode Workflow



Combined with the above figure, the basic workflow of the loss-in-weight scale in batching mode is described as follows:

In the stopped state, if [3.1.4 Feeding Control] is set to ② Feed during both running and stopping, the controller will detect whether the material weight is below [4.2.6 Lower Limit]. If it is below the lower limit, the "Q10. Feeding" output signal will be

activated to add material to the hopper until the weight reaches [4.2.5 Upper Limit], then stop feeding.

1. Click to start, first check if the material weight is below [4.2.6 Lower Limit] and needs feeding. If feeding is needed, wait for feeding to complete, then click start again to begin operation.
2. Start the [4.3.1 Pre-Feeding Delay] time. After the time is up, perform stability check and tare, then start the feeding process.
3. After starting fast feed, wait for a [4.3.2 Fast Feed Judgment Prohibition Time] before starting weight comparison.
4. Continuously collect weight and compare. When the weight value $\geq$ [4.2.1 Target Value] - [4.2.2 Fast Feed Advance], turn off "Q3. Fast Feed" and turn on "Q4. Med Feed".
5. After starting Med feed, wait for a [4.3.3 Med Feed Judgment Prohibition Time] before starting weight comparison.
6. Continuously collect weight and compare. When the weight value $\geq$ [4.2.1 Target Value] - [4.2.3 Med Feed Advance], turn off "Q4. Med Feed" and turn on "Q5. Slow Feed".
7. After starting slow feed, wait for a [4.3.4 Slow Feed Judgment Prohibition Time] before starting weight comparison.

8. Continuously collect weight and compare. When the weight value $\geq$ [4.2.1 Target Value] - [4.2.4 Slow Feed Drop], turn off "Q5. Slow Feed" and end feeding.
9. After feeding ends, if [4.6.1 Over/Under Difference Detection] is turned on, wait for a [4.6.2 Over/Under Difference Detection Delay] time. After the time is up, check system stability, then perform over/under difference detection. If over or under difference is detected, output an over/under difference alarm according to the settings, or directly pause.
10. After over/under difference detection ends, if [4.5.1 Drop Correction] is turned on, perform drop correction, then fixed value, wait for [4.3.5 Fixed Value Hold Time].
11. After the time is up, fixed value ends. At this time, record the total accumulated weight, then end this batching process, stop operation, and wait for the next start.

Note: The workflow does not include special functions such as over/under difference detection. Please refer to the corresponding function chapters for details.

v. Common Troubleshooting

When the controller is running, the main interface will display detailed running steps, indicating the current function and process being executed by the controller. This prompt can help determine the current running process of the controller and assist in troubleshooting.

Some possible faults and troubleshooting methods during the use of the controller are listed below:

No.	Content	Description
1	ADOFL / - ADOFL	Sensor signal abnormal. 1. Sensor wiring is wrong or poor contact. (Note the wiring for 4-wire and 6-wire systems) 2. Sensor is damaged. 3. Sensor load exceeds the range.
2	OFL / -OFL	Weight overflow. When the weight exceeds [1.1.4 Maximum Range], OFL is displayed. If OFL is displayed when empty, check: 1. [1.1.4 Maximum Range] setting is correct. 2. Calibration is abnormal, recalibrate. 3. Sensor is damaged.
3	Equipment Static Weight Abnormal Fluctuation	1. Check if the sensor wiring is correct and reliable, and if the wiring is rusty or oxidized. 2. Check if the weighing mechanism is affected by external force or vibration. 3. Check if the sensor is damaged. 4. Check if the sensor or controller is interfered by surrounding electrical equipment, such as motors, inverters, etc. 5. Check if [2.1.5 Filter Level] setting is appropriate.
4	Cannot Start	1. Check if the external start button and other input lines are properly connected to the controller (can be checked via digital I/O test). 2. Check if the start signal input port is correctly defined as start.

5	Inaccurate Reduction Result	1. Inaccurate result displayed by the controller after reduction: 1. Adjust the recipe parameters for fast, Med, and slow feed advance to ensure sufficient time for slow feed process to ensure accuracy. 2. Check if the reduction mechanism is normal, such as if the discharge port is blocked or if the material flow is smooth. 2. The controller displays accurate results, but the actual reweighing result is inaccurate. 1. If there is a deviation between the displayed and actual weight, recalibrate. 2. It is best to use a weight or material of the same weight as the target value for calibration, and ensure the scale platform is evenly loaded during calibration.
6	Inaccurate Accumulated Weight	The controller records the accumulated value at the end of the fixed value process, so check if [4.3.5 Fixed Value Hold Time] is sufficient. Ensure that the weight displayed by the controller is stable and not fluctuating significantly at the end of the fixed value hold time to record accurate feeding accumulated results.

Appendix

Update Record

Date	Content
2022-8-16	First edition.
2022-8-29	Added "I21 Manual Feeding" input signal and its description.
2022-10-14	Added [3.1.6 Work Mode] parameter and its description.
2022-10-18	Added section 4.3 Batching Mode Workflow and its description.
2025-2-11	Added section 1.4 Serial Port Wiring Method. Updated [8.1.10 Reset Signal Logic] description.