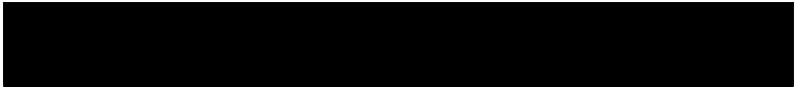




AMC501-A

Instruction Manual of Flow Controller

AMC501-A-920B01

- Multiple feeding mechanisms are available for selection
 - Dual PID regulation
 - Support traffic establishment monitoring
 - Multiple traffic setting modes
- 

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Website:<http://www.szamp.cn/>

The execution standard of this product:

National Standard GB/T 7724-2008 "Electronic Weighing Instruments

JJF1624-2017 "Outline for Type Evaluation of Digital Weighing Display (Weighing Indicator)

JJG649-2016 Verification Regulation for Digital Weighing Display (Weighing Indicator)



Directory

i.	Basic information.....	1
1.1.	Features and Specifications	1
1.2.	Connection Port	3
1.3.	Sensor wiring method	4
1.4.	IO wiring and definition	4
1.4.1.	Schematic diagram of IO	4
1.4.2.	Interface definition	5
ii.	Main interface	6
iii.	System maintenance	9
3.1.	Weight Cal	9
3.1.1.	Weights Clb	10
3.1.2.	No weight calibration	12
3.1.3.	Input calb	12
3.2.	Basic weighing parameters	13
3.2.1.	Basic weighing	13
3.2.2.	Sum	15
3.3.	Recipe set	15
3.3.1.	Mode select	16
3.3.2.	Process parameters	20
3.3.3.	PID Set	22
3.3.4.	Feed function	25
3.3.5.	Analog quantity function	28
3.3.6.	Flux Guard	30
3.3.7.	Flux calb	33
3.3.8.	Others	34
3.4.	IO	35
3.4.1.	In port	35

3.4.2.	Out port	39
3.4.3.	HO port	42
3.4.4.	IO test	45
3.5.	Module Set	46
3.5.1.	Analog quantity	46
3.5.2.	Sio	48
3.6.	Functional parameters	50
3.6.1.	Stir and feed struct	50
3.6.2.	Others	56
3.7.	Logic programming	58
3.7.1.	Logical output sequence diagram	60
3.8.	System	62
3.8.1.	Parameter reset	63
3.8.2.	Time and Date	63
3.8.3.	Product registration	63
3.8.4.	Parameter backup and recovery	64
3.8.5.	Data import and export	65
3.8.6.	Home page Definition	65
3.9.	Administrator password modification	66
iv.	Principle and function description	67
4.1.	Structure diagram and principle	67
4.2.	Wiring of frequency converter	68
v.	Trouble shoot Common Faults	69

i. Basic information

1.1. Features and Specifications

The AMC501-A loss-in-weight control all-in-one machine is a loss-in-weight controller that controls the material flow rate by using the loss-in-weight method to ensure that the material flows uniformly according to the set target. It is widely used in industries such as rubber and plastic, grain, chemical engineering, and dyeing and printing.

The basic characteristics of AMC501-A are as follows:

- Installation method: Cabinet installation (tray installation)
- Volume: $203 \times 149 \times 50$ (L * W * H, mm)
- Working voltage: DC24V
- Sensor: DC5V, supporting 4 and 6-wire sensors;
- Switch quantities: 7 input channels /12 output channels, supporting PWM/PFM output, customizable and testable functions;
- One RS232/RS485 communication channel each and an optional network port. Communication protocol: MODBUS-RTU;
- Two analog outputs(A02 is optional), and one analog input (optional);
- Supports four working modes: continuous standard, analog

quantity linkage, flow display, and volumetric mode;

- Intelligent dual PID regulation to achieve rapid response and precise control effects;
- The initial analog quantity and hold time can be preset, which can prevent the main unit from being blocked when starting up.
- Supports multiple feeding mechanisms, featuring feeding timeout detection, feeding debundling, and manual feeding support functions.
- It has a flow monitoring function, namely, alarm for flow over-limit and under-limit as well as alarm for flow establishment timeout.
- It features manual material cleaning, anti-bridge stirring control square wave output function and frequency converter fault detection, etc.

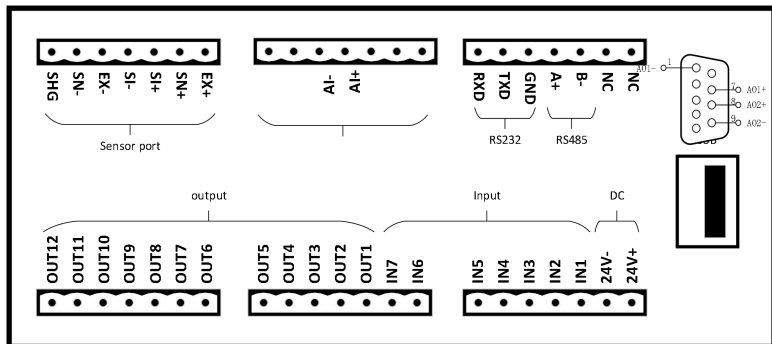
The detailed technical specifications are as follows:

Transducer Excitation	DC5V±10%/120mA Drive current/can receive eight Ω 350 specifications of the sensor
Adaptive Sensor Sensitivity	2mV/V or 3mV/V
Input Signal Range	0~15mV
Minimum Input Sensitivity	0.5uV/d
Nonlinearity	0.02%FS (3mV/V hour)
Zero Drift	<0.5 μ V/°C
Gain Drifting	<10PPM/°C

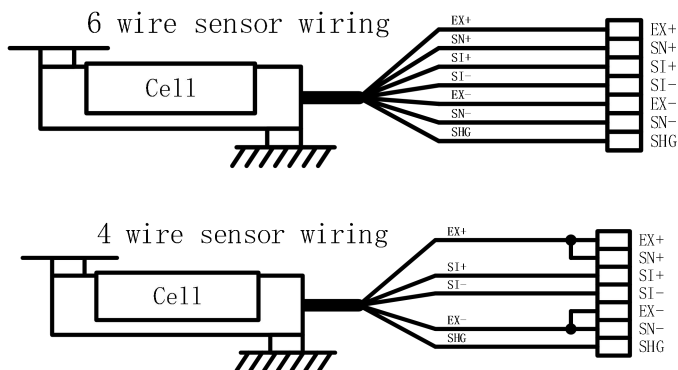
AD Rate	960Times/Seconds
Maximum Accuracy of Display	1/100000
Product Accuracy Grade	III
Working Voltage	DC24V (18V~30V compatibility)
Product Power Consumption	<5W
<u>Operating Temperature Range</u>	-10℃~45℃
Storage Temperature	-20℃~60℃
Humidity	Within 90%RH (No Condensation)

1.2. Connection Port

The connection Port is shown:



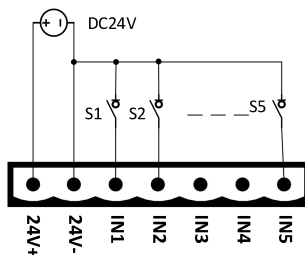
1.3. Sensor wiring method



1.4. IO wiring and definition

1.4.1. Schematic diagram of IO

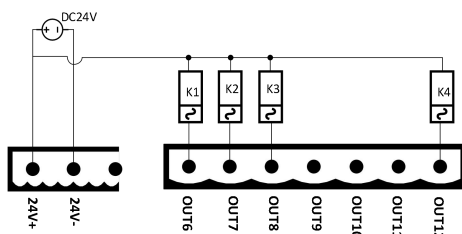
For example, IN1, IN2, and IN5 are shown as follows:



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

1. The external circuit must be co-located with the controller;
2. When the input power of the external circuit is low, the input is valid; otherwise, the input is invalid.

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



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

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

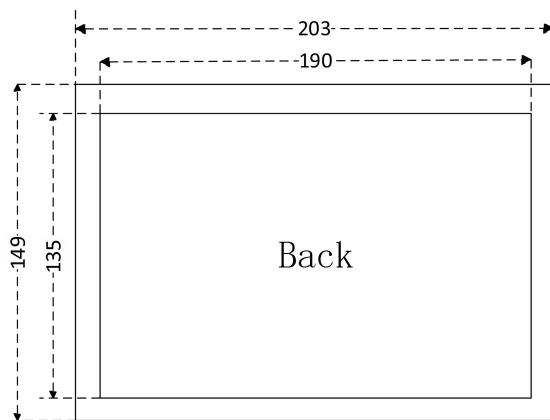
Note: the maximum driving capacity of each switch output is 500mA. Please pay attention to the power of the load when connecting the load. If the power exceeds the driving capacity of the output, the switch output may be damaged.

1.4.2. Interface definition

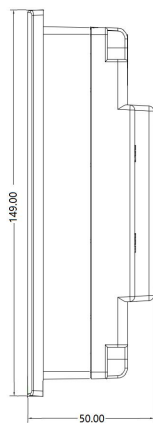
interface	instructions	interfa	instructions
24V+	DC24V +	24V-	DC24-
IO Input			
IN1	I1.Run/Stop(pul)	IN2	I2.Zeroing
IN3	I4.Feed valve On/off	IN4	I5.Manual Empty
IN5	I8.Clr Alarm	IN6	I10. Freq Cvt Fault
IN7	I23. Cut Closed-Inp		
IO Output			
OUT1	Q1.Run/Stop	OUT2	Q2.Freq Cvt ON/OFF
OUT3	Q3.Feed	OUT4	Q9.Feed Lack
OUT5	Q9.Alarm	OUT6	Q6.Feed Low Alarm

OUT7	Q5.Feed Enough	OUT8	Q10.Ration OK
OUT9	Q11. Stir	OUT10	Q12.Disturb
OUT11	Q13.Freq Cvt Fault	OUT12	Q23.Cut OFF
Sensor interface			
EX+	Load Cell Excitation+	EX-	Load Cell Excitation-
SN+	Load Cell Sense+	SN-	Load Cell Sense-
SI+	Load Cell Signal+	SI-	Load Cell Signal-
SHG	Load Cell Shielded Wire		

1.5. Installation Dimensions



Bottom view



Side view

Recommended cutout dimensions: 192mm × 138mm

ii. Main interface

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



The top column displays the current flow value, weight value, status markers such as operation, feeding, and interference, as well as the detailed operation steps of the controller.

The contents displayed in the middle two columns are described as follows:

The Recipe display the currently selected recipe number and name.

【Working Mode】 Display the mode selected by parameter item 3.1.4

【Flow mode】 is determined by the Settings of the given flow and given weight in the mode selection interface.

【Warring】 Display the alarm information when there is an alarm

【TGT-flux】 refers to the target flow of the current Recipe.

【Ration-W】 It is used to automatically stop after setting the amount of material to be discharged. When set to 0, the quantitative weight function is turned off.

【KP】 The proportional coefficient of PID1

【TI】 The integration time of PID1

【TS】 The control period of PID1

【Analog】 Display real-time analog quantities

The bottom column contains function keys, which can be used to set some parameters and perform operations.

Sys-Maintain: Enter the main interface for controller system maintenance.

Fast set : You can quickly set common parameter items. As shown in the following figure:

← Quit		Fast Set				Home →	
1:	Given Flux	0.000	kg/h	9:	Flux Damping	97.0	dB
2:	Init Percent	20.0	%	10:	Clb Flux	0.000	kg/h
3:	Init Percent Time	0.0	s	11:	Clb Analog	0.000	%
4:	Line Percent Hold Time	20.0	s	12:	Kp1	20.0	%
5:	Flux Trans Time	20	s	13:	Ti1	6.00	s
6:	Flux Sample Freq	0.10	s	14:	Td1	0.00	s
7:	Flux Sample Time	20.0	s	15:	Ts1	2.00	s
8:	Flux Osc Range	20.0	%				

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

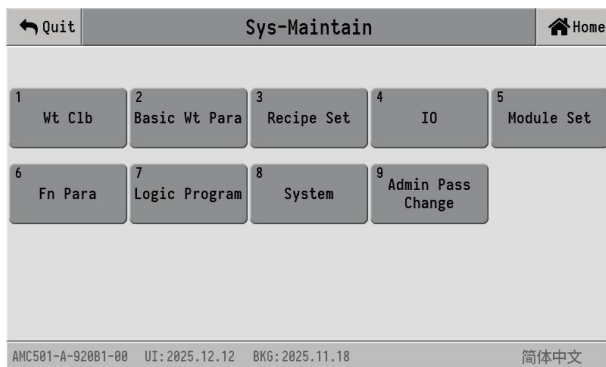
Clr total Sum: Perform a zeroing operation on the current total cumulative value.

Start: A gray color indicates a stop status. Click **Start**. If no error is reported, the system will initiate the weightlessness control process.

iii. System maintenance

On the main interface, click **Sys-Maintain** enter the main menu interface of 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.

3.1. Weight Cal

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 should be set properly.

There are three ways to calibrate weight. You can choose any one of them 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.

3.1.1. Weights Clb

Quit 1. Weight Clb Home

1.1 Weights Clb
1.2 No Wt Clb
1.3 Input Clb

Unit kg

Point 0.000

Min Div 1

Max Range 500.000

0.00000

1.516 kg

Ad Stab Wt Stab

Abs Vol: 0.000mV
Rel Vol: 0.000mV

Zero Clb Weights Clb

The sensor voltage displayed in the right column refers to the current voltage value of the 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.

Relative voltage, on the other hand, refers to the

difference between the current absolute voltage and the voltage value at zero point calibration, which is equivalent to the voltage value generated by the gain weight.

The calibration process can be completed in just two steps: empty scale calibration and weight calibration. The operation is as follows:

1. Empty the scale platform. After the signal stabilizes (the absolute voltage does not fluctuate), click the **zero clb** button. When the display "Empty scale sampling calibration inprogress" is successful, it will prompt that the empty scale calibration is successful.
2. Place the weights or objects of known weight on the scale platform. After the signal stabilizes (the absolute voltage does not fluctuate), click **weight clb** button. At this time, an input box will pop up. Enter the exact weight of the placed object and click Confirm. When successful, there will be a prompt indicating that the weight calibration is successful.

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.

"Abs vol" refers to the real-time voltage of the current load cell.

"Rel vol" is the change in voltage caused by placing weights after the empty scale is calibrated, and it is also the voltage corresponding to the weights.

3.1.2. No weight calibration

← Quit 1. Weight Clb Home

1.1 Weights Clb
1.2 No Wt Clb
1.3 Input Clb

Unit kg

Point 0.000

Min Div 1

Max Range 500.000

0.00000

1.516 kg

•Ad Stab •Wt Stab
Abs Vol: 0.000mV
Rel Vol: 0.000mV
Sensor mvv 2.0000 Sensor Rng 10.0000
Zero Clb

On this interface, you can input zero clb complet zero point calibration .click the sensor mv/V&sensor Rng complet weight calibration .

3.1.3. Input calb

← Quit 1. Weight Clb Home

1.1 Weights Clb
1.2 No Wt Clb
1.3 Input Clb

Unit kg

Point 0.000

Min Div 1

Max Range 500.000

0.00000

1.516 kg

•Ad Stab •Wt Stab
Abs Vol: 0.000mV
Rel Vol: 0.000mV
Zero Code 104
Wt Code 104858
Weight 2.000

For calibration input, three pieces of data need to be entered: the inner weight of the empty scale, the inner weight of the weight, and the weight of the weight.

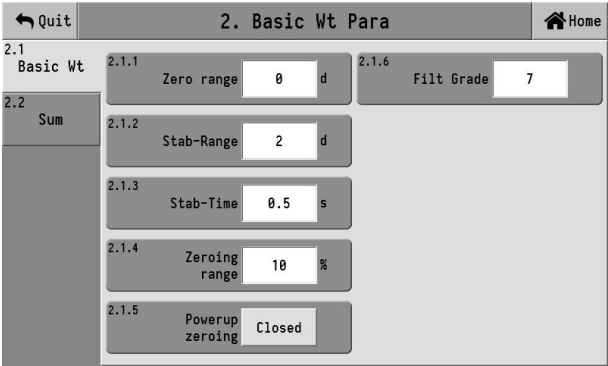
After weight calibration or calibration without

weights, these three data will have corresponding changes and can be recorded. When necessary, input these three recorded data to complete the input calibration.

3.2. Basic weighing parameters

In the sys-maintain interface,click the Basic Wt Para button to enter the setting interface for basic weighing parameters and cumulative parameters. The interface is as follows:

3.2.1. Basic weighing



2.1.1	Zero range	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	Stab-Range	1~9d	These two parameters work together to determine whether the weight is stable.
2.1.3	Stab-time	0.1 ~	

		9.9 s	Take all the weight values within the " Stab-time ". If the difference between the maximum and minimum values is $\leq$ the " Stab-Range ", it is considered that the weight value is stable at this time.
2.1.4	Zeroing range	0-99% When performing the zeroing operation, the weight must be less than or equal to "max range $\times$ zeroing range" to allow zeroing.	
2.1.5	Powerup zeroing	After being turned on, the controller will automatically perform a zeroing operation each time it is powered on and started.	
2.1.6	Filter Grade	0 to 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.	

3.2.2. Sum



【 Tot Sum Wt 】 The total cumulative weight of all discharged materials is linked to the weight unit and the weight decimal point. Clicking the "Clear" button can clear the total cumulative weight.

【 This Sum Wt 】 The weight of the discharge from a single operation is recalculated each time the operation is started. Linked to the quantitative weight unit and the quantitative decimal point, clicking "Clear" can clear the cumulative weight and the cumulative time of this time.

【 This Sum time 】 The length of a single run, which is recalculated each time it starts running. Linked to the quantitative time unit, clicking "Clear" can clear the cumulative weight and the cumulative time of this time.

3.3. Recipe set

In the sys-maintain interface, click on the **Recipe Set** to enter the Recipe parameter setting interface, as shown in the following figure. Different Recipe parameters and

names can be set according to different occasions.

AMC501-A supports up to 10 groups of Recipes and classifies parameters into several major categories based on functions and control processes.

3.3.1. Mode select

The relevant functional parameters of the working mode of the weightless scale can be set.

3.1.1	Given flux	Set flux
3.1.2	flux unit	g/m(grams per minute), g/h(grams per hour), kg/m(kilograms per minute), kg/h(kilograms

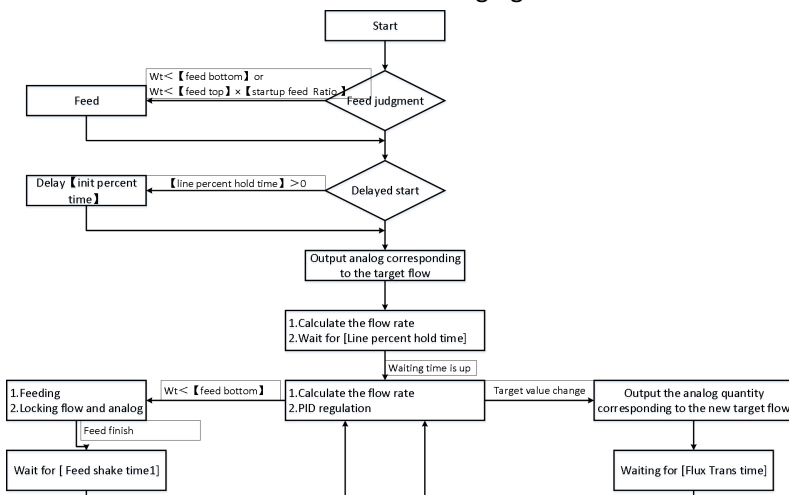
		per hour), t/m(tons per minute), t/h(tons per hour)
3.1.3	flux point	0 to 4 bits
3.1.4	Work mode	Continuous standard, analog linkage, analog display, volumetric mode.
3.1.5	Shunt percent	Target flow rate = given flow rate $\times$ split ratio
3.1.6	Cmb Syn On Off	This switch is used for synchronization across multiple channels. In situations where all channels need to be fed before discharging materials uniformly, this switch is adopted for synchronization
3.1.7	Ration Wt	It is used to automatically stop after setting the output quantity. When set to 0, the quantitative weight function is turned off.
3.1.8	Ration Wt Unit	g, kg, t
3.1.9	Ration Wt point	0 to 4 bits
3.1.10	Ration Rrep Wt	When: outflow material weight $\geq$ Ration Wt - Ration Rrep Wt, switch to the low-speed operation set by the [Ration prep AO].
3.1.11	Ration prep AO	For example: assume the [Ration Wt] is 5kg and the [Ration Rrep Wt] is 1kg. Then, when the outflow material weight reaches 4kg, switch to low-speed operation using the [Ration prep AO 1].
3.1.12	Ration fall Wt	If the weight of the discharged material $\geq$ Ration Wt - Ration fall Wt, then the quantitative process is completed,

		and the operation stops
3.1.13	Ration time	Used to set how long it will automatically stop after running; when set to 0, the quantitative time function is turned off
3.1.14	Ration time Unit	s, m, h

There are four working modes to choose from, namely continuous standard, analog linkage, flow display and volumetric mode.

1. Continuous standard mode

Its workflow is shown in the following figure:



2. Analog quantity linkage mode (Optional analog quantity input required)

This mode is a working mode in which the target traffic is set in real time by inputting analog quantities.

For example:

If the input analog range is 0-10V, and the flow rate corresponding to the minimum input analog value is set to 0kg/h, and the flow rate corresponding to the maximum input analog value is set to 100kg/h,

then when the input analog value is $5V$, $\frac{5V \times 100\%}{10V} = 50\%$ the target flow

rate = $\frac{50\% \times 100kg/h}{100\%} = 50kg/h$ During operation, PID regulation will be

automatically carried out to keep the real-time flow rate stable at around $50kg/h$.

When the input analog quantity is $2V$, $\frac{2V \times 100\%}{10V} = 20\%$ the target

flow rate = $\frac{20\% \times 100kg/h}{100\%} = 20kg/h$ During operation, PID regulation

will be automatically carried out to keep the real-time flow rate stable at around $20kg/h$.

3. Traffic display mode

This mode does not control or adjust; it only measures and displays the flow rate. The "Measurement Coefficient" and "control coefficient" processes the displayed flow value.

4. Volumetric mode

The volumetric mode, also known as the fixed-frequency mode, has a fixed output analog quantity and a fixed display flow rate, without adjusting the PID.

For example:

Suppose the calibrated flow rate is set to $50kg/h$ and the calibrated analog quantity is set to 50% . Then, when the "target flow rate" is set to $80kg/h$, 80% of the analog output is fixed, and the displayed flow rate is also fixed at $80kg/h$.

3.3.2. Process parameters

Quit		3.2 Process Para				Home	
3.2.1	Init Percent	20.0	%	3.2.8	Flux Damping	97.0	dB
3.2.2	Init Percent Time	0.0	s	3.2.9	Start Dly	0.0	s
3.2.3	Line Percent Hold Time	20.0	s	3.2.10	Start Trans Time	2.5	s
3.2.4	Flux Trans Time	20	s	3.2.11	Start Stab Time	2.5	s
3.2.5	Flux Sample Freq	0.10	s	3.2.12	Change Trans Time	1.0	s
3.2.6	Flux Sample Time	20.0	s	3.2.13	Change Stab Time	2.5	s
3.2.7	Flux Osc Range	20.0	%	3.2.14	Run Clb Time	10	s

3.2.1	Init percent	0.0-100.0%	The magnitude of the analog quantity output first when starting up and running
3.2.2	Init percent time	0.0 to 6000.0 seconds;	When starting up and running, output the duration of the "Input initial analog quantity". When set to 0, no "initial analog quantity" will be output at startup.
3.2.3	Line percent hold time	0.0 to 6000.0 seconds;	After the "initial analog quantity holding time", output the analog quantity corresponding to the target flow rate, then hold the "linear analog quantity holding time", and only then do PID regulation begin.
3.2.4	Flux Trans times	0-60000s;	During operation, if the target flow is modified, directly output the analog quantity corresponding to the new target flow and maintain the [flow switching delay] before resuming PID regulation.
3.2.5	Flux sample Freq	0.00 to 99.99 seconds;	The collected weight is used to calculate the interval time of flow

3.2.6	Flux Sample Time	0.00to 99.99 seconds; Collect the weight over a certain period of time for calculating the flow rate
3.2.7	Flux Osc range	0.0-100.0%The scope of application of flow filters
3.2.8	Flux Damping	The filtering effect of the 0.0 to 99.9dB flow filter
3.2.9	Start Dly	It is only after this period of time that the actual material comes out. When multiple loss-in-weight scales are fed side by side to the same conveyor, the materials at the beginning can also be evenly connected
3.2.10	Start Trans Time	0.0 ~ 6000.0 s
3.2.11	Start Stab time	0.0 ~ 6000.0 s
3.2.12	Change Trans time	0.0 ~ 6000.0 s
3.2.13	Change Stab Time	0.0 ~ 6000.0 s
3.2.14	Run Clb Time	0~60000;

3.3.3. PID Set

← Quit		3.3 PID Set		Home →	
3.3.1	PID Mode	Standard		3.3.7	Td1 0.00 s
3.3.2	PID Alt Range	30.0 %		3.3.8	Ts1 2.00 s
3.3.3	Fast To Slow Time	1.0 s		3.3.9	Kp2 30.0 %
3.3.4	Fast To Slow Time	3.0 s		3.3.10	Ti2 3.00 s
3.3.5	Kp1	20.0 %		3.3.11	Td2 0.00 s
3.3.6	Ti1	6.00 s		3.3.12	Ts2 1.00 s

3.3.1	PID mode	① Standard Adopting PID1(proportionality coefficient 1, integral time 1, differential time 1, control intermediate 1), the adjustment speed is relatively conservative but stable. ②Dual PID Adopt PID1 and PID2, and switch between PID1 and PID2 when the conditions are met ③ Auto PID The PID parameters are automatically calculated by the instrument ④ Custom PID Adopting PID1(proportionality coefficient 1, integral time 1, differential time 1, control interim 1), the adjustment speed is relatively fast, but it may be unstable.
3.3.2	PID Alt range	0.0-100.0% The percentage of the target traffic, within the percentage range, uses PID1, and

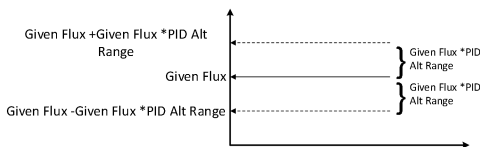
		beyond the percentage range, uses PID2
3.3.3	Fast to slow time	Assuming it is set to 10 seconds, then when the real-time traffic reaches the switching range and lasts for 10 consecutive seconds, PID1 will be used for fine-tuning
3.3.4	Slow to fast time	Assuming it is set to 20 seconds, then when the real-time traffic exceeds the switching range by as long as 20 seconds, PID2 will be used for rough adjustment
3.3.5	KP1	The proportional coefficient of PID1
3.3.6	Ti1	The integration time of PID1
3.3.7	Td1	Differential time of PID1
3.3.8	Ts1	The control period of PID1
3.3.9	Kp2	The proportional coefficient of PID2
3.3.10	Ti2	The integration time of PID2
3.3.11	Td2	Differential time of PID2
3.3.12	Ts2	The control period of PID2

To keep the flow rate stable around the set target flow rate, the AMC501-A will adjust the output of the analog quantity in real time, that is, perform PID regulation. PID has four modes. There are also two sets of PID parameters, namely PID1 and PID2. When the PID uses the standard mode, only the PID1 parameter is used. When the PID uses the dual PID mode, two sets of parameters, PID1 and PID2, are used. PID1 corresponds to the fine tuning, and PID2 corresponds to the coarse tuning.

The PID parameters are in the menu item "3.3 PID Settings", and the parameters are as follows:

1. [PID Coarse Adjustment to Fine Adjustment Switching Time] As

shown in the following figure, when the real-time traffic enters the range between the two dotted lines of the figure and continues for [PID coarse adjustment to fine adjustment switching time], the PID switches to the fine adjustment mode;



2. [PID Fine-tuning to Coarse Adjustment Switching Time] As shown in the figure, when the real-time flow is lower than the lower dotted line or higher than the upper dotted line and the [PID Fine-tuning to coarse adjustment switching Time] is continuously maintained, the PID switches to coarse adjustment mode.

3.[PID1 Proportional Coefficient]/ [PID2 Proportional Coefficient] The proportional link of PID reflects the deviation signal of the control system in proportion. Once a deviation occurs, the controller immediately takes control action to reduce the deviation (the larger the proportion, the faster the control).

4. [PID1 Integration Time] / [PID2 Integration Time] The integration stage of PID is mainly used to eliminate static errors and improve the accuracy of the system. The strength of the integration effect depends on the integration time constant. The longer the integration time, the weaker the integration effect; conversely, the shorter the integration time, the stronger the integration effect (the shorter the integration time, the faster the control).

5. [PID1 Differential Time]/ [PID2 Differential Time] The differential link of PID reflects the changing trend (rate)

of the deviation signal and can introduce an effective early correction into the system before the deviation signal becomes too large, thereby accelerating the system's action speed and reducing the regulation time (the larger the differential time, the faster the control).

6. [PID1 Control Cycle] / [PID2 control Cycle] The time interval for PID to update the analog output;

When the controller is in operation, if the dual **PID** function is enabled, the controller will start with coarse adjustment PID2 to **quickly** approach the target value in terms of flow rate. If the actual flow rate has reached the set range and maintained for the set time, the controller will switch to fine adjustment **PID1** control. When the user modifies the flow target value, or when the flow error exceeds the set range and remains within the set time, the controller will resume the **coarse** adjustment PID2 control to quickly keep the actual flow around the target value.

3.3.4. Feed function

Quit		3.4 Feed Fn	Home	
3.4.1	Startup Feed Ratio	75	%	
3.4.2	Feed Bottom	0.000	kg	
3.4.3	Feed Top	0.000	kg	
3.4.4	Feed Over Time	0.0	s	
3.4.5	Feed Alarm Ctrl	Closed		
3.4.6	Feed Shake Time1	5.0	s	
3.4.7	Feed Shake Time2	0.0	s	
3.4.8	Resume Adj Time	20.0	s	
3.4.9	Feed Low Warning Wt	0.000	%	
3.4.10	Direct Supp Check Wt	0.000	%	
3.4.11	Direct Supp Tol Time	0.0	s	

3.4.1	Startup feed ratio	When starting and running from 0 to 100%, if the current weight is less than the upper limit of feeding $\times$ the initial feeding ratio, feed first and then run for discharging; otherwise, run for discharging directly
3.4.2	Feed bottom	Start feeding when the weight is lower than this value
3.4.3	Feed top	Stop feeding when the weight exceeds this value
3.4.4	Feed over time	If the supply limit is not reached within this time, it is considered faulty.
3.4.5	Feed alarm ctrl	①. close. ②. Alarm& continue feed; ③. Alarm &stop; ④. No alarm &resume, the feeding will be stopped and the PID regulation will be restored.
3.4.6	Feed shake time1	After the feeding is completed, wait for this period of time before resuming the flow calculation and flow regulation.
3.4.7	Feed shake time2	After the feeding is completed and the flow calculation and flow regulation have been resumed, wait for this time before the flow is displayed. Before this time, the flow remains locked.
3.4.8	Resume adj time	Under the condition of "no alarm and resumption of regulation", there will be no response to feed supply during this time period. Only after this time will it be detected whether to restart the feed supply.
3.4.9	Feed low warning Wt	If the weight is lower than this value, a switch signal will be output as a prompt

3.4.10	Direct supp check Wt	If the weight continues to increase within the set time, it is considered that manual feeding is in progress, and the feeding state is entered
3.4.11	Direct supp Tol time	If the weight continues to decrease within the set time, it is considered that the manual feeding is completed and the feeding state is exited

The controller supports three types of feeding functions: automatic feeding, on-off feeding, and manual feeding.

1. Automatic feeding

Automatic feeding refers to the mode in which the program automatically controls when to start and when to stop feeding during operation. Its relevant parameters include the initial feeding ratio, the initial feeding weight, the stopping feeding weight, etc.

【3.4.1 Startup feed ratio】 If the initial feeding ratio is set to 70% and **【3.4.3 Feed top】** is set to 100kg, then when starting the operation, if the current weight value is less than 70kg(100kg x 70%), start the feeding first, and then operate after the feeding is completed. If the current weight value is higher than 70kg, no material will be supplied but the operation will be carried out directly.

2. Switching quantity feeding

Users can connect the switch and define the switch quantity input as "I9 in/out feeding". When feeding is required, make the switch quantity effective. The controller will lock the flow rate and analog quantity and enter the feeding state. When the switch quantity is invalid, the controller will exit the feeding state and return to the normal working process.

3. Manual feeding

During operation, if it is necessary to add materials directly

into the metering hopper manually, the manual feeding function should be turned on, that is, set both parameters [3.4.10 Direct supp check Wt] and [3.4.11 Direct supp Tol time] to non-zero values. As long as one parameter is 0, the manual feeding function should be turned off

2) Feeding in the stopped state (start-up operation is prohibited)

In the stopped state, the switch quantity can be used to start the feeding. Define the input switch quantity I4 for manual feeding. When the feeding output is invalid, give a pulse signal to start manual feeding. When the feeding output is effective, a pulse signal can be given to stop the feeding. If no pulse signal is given during feeding, the feeding will automatically stop when the material is filled to the [3.4.3 Feed top]

3.3.5. Analog quantity function

← Quit		3.5 Analog Fn		Home →	
3.5.1	Analog 1 Fn	Flux Ctrl	3.5.7	Ctrl Analog Bottom	0.00 %
3.5.2	Analog 2 Fn	Flux Disp	3.5.8	Ctrl Analog Top	100.00 %
3.5.3	Disp Flux Bottom	0.000 kg/h	3.5.9	Analog Max Adj Percent	100.0 %
3.5.4	Disp Flux Top	0.000 kg/h	3.5.10	In Flux Bottom	0.000 kg/h
3.5.5	Disp Wt Bottom	0.000 kg	3.5.11	In Flux Top	0.000 kg/h
3.5.6	Disp Wt Top	0.000 kg			

3.5.1	Analog 1 func	It is used to set the function of the output analog quantity 1 ①Flux ctrl ②Flux disp ③Wt disp
3.5.2	Analog 2 func	It is used to set the functional role of the output

		analog quantity 2 ①Flux ctrl ②Flux disp ③Wt disp
3.5.3	Disp Flux bottom	When the analog quantity is used for "flow display", the parameters are valid.
3.5.4	Disp flux top	Suppose the analog output is 0-10V, the lower limit of the displayed flow is 0, and the upper limit of the displayed flow is 100. Then, when the real-time flow is 50, the analog output is 5V.
3.5.5	Disp Wt Bottom	When the analog quantity is used for "weight display", the parameters are valid.
3.5.6	Disp Wt top	Suppose the analog output is 0-10V, the lower limit of the displayed weight is 0, and the upper limit of the displayed weight is 200. Then, when the real-time weight is 100, the analog output is 5V.
3.5.7	Ctrl Analog bottom	When PID regulation is carried out, the output analog quantity will not be lower than this lower limit value
3.5.8	Ctrl analog Top	When PID regulation is carried out, the output analog quantity will not exceed this upper limit value
3.5.9	Analog max Adj percent	When PID regulation is performed, the amount adjusted each time will not exceed the set value.
3.5.10	In flux bottom	It is valid when an optional analog input is provided and the input analog is used to set the target flow rate.
3.5.11	In flux top	Suppose the input analog quantity is 0-10V, the lower limit of the input analog quantity is 0, and the

		upper limit of the input analog quantity is 500. Then, when the input analog quantity is 2V, the target flow is 100.
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3.3.6. Flux Guard

← Quit		3.6 Flux Guard		Home →	
3.6.1	Flux Over	0.000	kg/h	3.6.9	Distb Stab Range 0.000 kg
3.6.2	Flux Under	0.000	kg/h	3.6.10	Distb Stab Time 0.5 s
3.6.3	Flux Over Tol Time	0.0	s	3.6.11	Distb No Pid Closed
3.6.4	Flux Under Tol Time	0.0	s	3.6.12	Distb Resume Time 3.0 s
3.6.5	Over/Und Alarm Mode	Stop		3.6.13	Distb Filt Grade 3
3.6.6	Flux Setup Low Limit	0.000	kg/h	3.6.14	Under Wt 0.000 kg
3.6.7	Flux Setup High Limit	0.000	kg/h	3.6.15	Max Out Tol Time 0.0 s
3.6.8	Flux Setup Time Limit	0.0	s		

3.6.1	Flux Over	The target traffic plus the traffic deviation is the upper limit of the traffic deviation. When set to 0, the out-of-tolerance judgment function is turned off
3.6.2	Flux Under	Target traffic - traffic deficit, which is the lower limit of the traffic deficit. When set to 0, the deficiency judgment function is turned off
3.6.3	Flux Over Tol Time	If the target flow is exceeded for this consecutive period of time and the flow is out of tolerance, it will be determined as out of tolerance
3.6.4	Flux Under Tol Time	If the flow rate is lower than the target for this consecutive period of time - the flow rate is poor, it is determined as poor

3.6.5	Over/Und Alarm mode	①stop ; ②cont
3.6.6	Flux setup low limit	From the start of operation, after the time set by the "Flow Establishment Time Limit", the flow must exceed this lower limit; otherwise, an alarm will be triggered. If it is set to 0, the lower limit area will not be used
3.6.7	Flux setup high limit	From the start of operation, after the time set by the "Flow Establishment Time Limit", the flow must be lower than this upper limit; otherwise, an alarm will be triggered. If it is set to 0, the lower limit area will not be used.
3.6.8	Flux setup time limit	From the start of operation, after this period of time, the flow must be within the range of the "lower limit of flow establishment" and the "upper limit of flow establishment"; otherwise, an alarm will be triggered. If it is set to 0, the traffic establishment monitoring function will be turned off.
3.6.9	Distb Stab range	When the continuous interference stabilization time and weight both exceed the interference stabilization range, it is determined that interference has occurred
3.6.10	Distb Stab range	
3.6.11	Distb NO pid	When interference is determined to occur, the PID can be set not to be adjusted
3.6.12	Distb resume time	Only when the interference determination condition disappears and persists for this period of time can it be determined that the interference has indeed disappeared

3.6.13	Distb filt grade	The filter used to determine interference must be set lower than the "Filter Level" in the basic weighing parameters
3.6.14	Under Wt	When the real-time weight is lower than this weight and remains so for 1 second, it is considered underload and an alarm will be triggered to stop the machine. Setting it to 0 will disable the underload function
3.6.15	Max Out Tol Time	When the output analog quantity reaches 100% and the real-time flow is lower than the target flow for this period of time, an alarm will be triggered.

3.3.6.1 Traffic establishment

Traffic establishment refers to the process from ➔ "starting to run the target traffic". If it is necessary to monitor whether this process is normal, the traffic establishment monitoring function can be used. When the flow rate fails to reach the set range within the set time, an alarm will be initiated.

Note that if both "3.6.6 Flux setup low limit " and "3.6.7 Flux setup high limit " are set to 0, the traffic establishment monitoring function will also be disabled.

3.3.6.2 Interference in identification and handling

The touch function is used to detect the interference of external forces and try to counteract the impact of such interference. This function has five related parameters: [3.6.9 Distb Stab range] to [3.6.13

Distb filt grade].

Its working principle is as follows: During normal operation, if the change in weight value exceeds the "3.6.9 Distb Stab range " and persists for the "3.6.10 Distb Stab range ", it is considered that interference has occurred. If the "3.6.11 Distb NO pid " switch is turned on, the flow and analog quantities will be locked and remain unchanged. After the interference disappears, the flow calculation and analog quantity adjustment will be restored after the [3.6.12 Distb resume time]. 【3.6.13 Distb filt grade】 is a filter level specifically designed for interference functions. Its setting should be smaller than that of 【2.1.6 Filter Level】 in the basic weighing parameter interface, preferably less than 5.

After interference occurs, the output of the switch quantity will be OUT12. If the signal is accidentally touched by humans and the interference disappears, OUT12 will occur. The signal of accidental human touch will also disappear.

3.3.7. Flux calb

The screenshot displays the '3.7 Flux Clb' interface. At the top, there are 'Quit' and 'Home' buttons. The main display area shows '0.000 kg/h' in large digits. Below this, there are several control buttons: 'Test Analog' (set to 20.000 %), 'Manual Test', 'Start Test', 'Clb', 'Auto Clb', 'Sample Dly' (20.0 s), 'Sample Time' (40.0 s), 'Start Auto Clb', and 'Mul Clb'. A secondary display shows '1.516 kg'. On the left, there are two readouts: 'Clb Flux' (0.000 kg/h) and 'Clb Analog' (0.000 %). On the right, there are two more readouts: 'Flux Sample Freq' (0.10 s) and 'Flux Sample Time' (20.0 s). At the bottom right, there is a 'Flux Clb Mode Rt Trace' button.

The upper left corner is for frequency converter testing, which is used to test whether the wiring and

Settings of the frequency converter are correct. When the percentage of the test analog quantity is input and the test is started, the motor begins to rotate. When the percentage of the analog quantity is changed, the motor speed will also change accordingly.

Flow calibration is to establish the corresponding relationship between analog quantities and flow.

Flow calibration is carried out in the following steps:

Input the test analog quantity, such as 20%;

2. Press "Start Test";

3. Wait for 20 to 40 seconds;

4. Click "Calibration";

5. Press "Stop Test" to complete the flow calibration.

3.3.8. Others

3.8 Others	
3.8.1	Sum Pul Wt 0.000 kg
3.8.2	Sum Cont Time 0.0 s

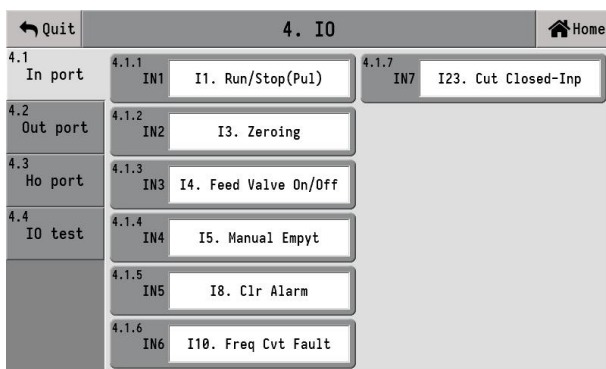
3.8.1	Sum Pul Wt	During operation, for each outflow of this weight of material, a pulse is output
3.8.2	Sum Cont Time	When the stop button is pressed, continue to maintain this time and accumulate the weight before stopping

3.4. IO

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

3.4.1. In port

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



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

Num	name	Description
I0	NC	That is, no functions are assigned.
I1	Run/Stop (Pul)	If it is currently in a stopped state, it will start running after a pulse is given. 2. If it is currently in operation, it will stop running after a pulse is given.

I2	Run/Stop (level)	It starts running when the input is valid and stops running when the input is invalid.
I3	Zeroing	Each pulse is given to reset the weight to zero once.
I4	Feed Value On/Off	It only works in the stopped state 1. If the feeding valve is closed, open the feeding valve after giving the pulse. 2. If the feeding valve is open, close the feeding valve after giving the pulse.
I5	Manual empty	It works in the stopped state, effectively starting the material cleaning once and effectively stopping the material cleaning again.
I6	Feed opened- inp	It is only valid when the motor is used for feeding
I7	Feed closed- Inp	It is only valid when the motor is used for feeding
I8	Clr alarm	When there is an alarm at present, it can be cleared once.
I9	Enter/exit feed	The input level signal will only take effect during operation When the input is valid, notify the instrument to enter the feeding state. 2. When the input is invalid, notify the instrument to exit the feeding state.
I10	Freq Cvt Fault	When the input is valid, it indicates that the frequency converter has malfunctioned.

		At this time: If it is in a stopped state, it cannot be started and run. 2. If it is in operation, an alarm will sound and the machine will stop.
I11	Analog target	When the input is invalid, turn off the function of setting the target flow rate by inputting analog quantities
I12	Logic Tri1	Logic programming function 1
I13	Logic Tri 2	Logic programming function 2
I14	Logic Tri 3	Logic programming function 3
I15	Logic Tri 4	Logic programming function 4
I16	Logic tri 5	Logic programming function 5
I17	Logic Tri 6	Logic programming function 6
I18	Permit run OR	Input level signal When the input is valid, it can start running; when the input is invalid, it is prohibited to start running. 2. If it becomes invalid during operation, stop running immediately. 3. If multiple such signals are defined, the operation can be carried out as long as one of the inputs is valid.
I19	Permit run and	Input level signal When the input is valid, it can start running; when the input is invalid, it is prohibited to start running. 2. If it becomes invalid during operation,

		stop running immediately. 3. If multiple such signals are defined, the operation can only be started if all signal inputs are valid.
I20	Run(Pul)	In the stopped state, giving a pulse will start the operation. 2. When in operation, providing pulses is invalid and will be ignored.
I21	Stop (pul)	When in operation, giving pulses will stop the operation. 2. In the stopped state, giving pulses is invalid and will be ignored.
I22	OutP close-Inp	Use only in pulse control motor mode
I23	Cut close-Inp	The origin of the cut-off valve closing
I24	To fixed	It is only used in the "Continuous Standard" working mode 2. Pulse input: One pulse is applied to enter the volumetric discharge state (i.e., the fixed-frequency state). Give another pulse to exit the volumetric discharge state and return to the weightless state
I25	Remote Loc	Remote/Local Switching 1. Only use in AMC501-A 2. The level input being active indicates local mode; inactive indicates remote mode 3. When local mode is selected, remote

		target flow rate setting and start/stop operations are disabled; when remote mode is selected, local target flow rate setting and start/stop operations are disabled
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3.4.2. Out port

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

4. IO		Home
4.1 In port	4.2.1 OUT1 Q1. Run/Stop	4.2.7 OUT7 Q5. Feed Enough
4.2 Out port	4.2.2 OUT2 Q2. Freq Cvt ON/OFF	4.2.8 OUT8 Q10. Ration Ok
4.3 Ho port	4.2.3 OUT3 Q3. Feed	4.2.9 OUT9 Q11. Stir
4.4 IO test	4.2.4 OUT4 Q4. Feed Lack	4.2.10 OUT10 Q12. Disturb
	4.2.5 OUT5 Q9. Alarm	4.2.11 OUT11 Q13. Freq Cvt Fault
	4.2.6 OUT6 Q6. Feed Low Alarm	4.2.12 OUT12 Q23. Cut Off

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

Num	name	Description
Q0	NC	No function definition
Q1	Run/Stop	1. When the output is valid, it indicates that it is currently running. 2. When the output is invalid, it indicates that the current state is stopped.
Q2	Freq Cvt ON/OFF	The selected communication number of the frequency converter is used to control the

		start and stop of the frequency converter.
Q3	Feed	The opening and closing signals of the feeding valve.
Q4	Feed lack	When the current weight is lower than the lower limit weight for feeding, output this signal. 2. When the current weight is equal to or higher than the lower limit weight for feeding, turn off this signal.
Q5	Feed enough	When the current weight is equal to or higher than the upper limit of the feeding weight, output this signal. When the current weight is lower than the upper limit of the feeding weight, turn off this signal.
Q6	Feed low alarm	When the current weight is lower than the low supply warning weight, output this signal. When the current weight is equal to or higher than the low feeding warning weight, turn off this signal.
Q7	Feed over time	When a feeding timeout alarm occurs, this signal output is valid.
Q8	Feed Dir	It is only valid when the motor is used for feeding
Q9	Alarm	When an alarm occurs, output this signal. 2. When clearing the alarm, turn off this signal.

Q10	Ration OK	After the quantification is completed, output this signal. 2. This signal will be turned off when the operation stops, the alarm is cleared, or the quantitative parameters change.
Q11	Stir	It is used to control the anti-bridging stirring mechanism inside the metering hopper.
Q12	Disturb	When accidental contact interference occurs, output this signal. When the accidental touch interference disappears, turn off this signal.
Q13	Freq Cvt fault	When the input frequency converter is faulty and effective, output this signal. 2. When the input inverter fault is ineffective, turn off this signal.
Q14	Sum Pul	If the cumulative weight is not completed once, output this signal and keep it for 0.5 seconds.
Q15	Logic out 1	Logic program 1 Function output signal.
Q16	Logic out 2	Logic program 2 Function output signal.
Q17	Logic out 3	Logic program 3 Function output signal.
Q18	Logic out 4	Logic program 4 Function output signal.
Q19	Logic out 5	Logic program 5 Function output signal.
Q20	Logic out 6	Logic program 6 Function output signal.
Q21	Custom ctrl	The output and off state of this signal are controlled by external devices through communication to achieve custom control

		functions.
Q22	Outp Dir	It is used in the pulse control motor mode
Q23	Cut off	Control the material cutting structure

3.4.3. HO port

The AMC501-A supports high-speed pulse output control of common motors, stepper motors, servo motors, etc. The control methods include opening size, PWM(Pulse Width Modulation), and PFM(Pulse Frequency Modulation). The high-speed pulse wiring is as follows:

The high-speed pulse setting interface is as follows:

4.3.1	HO speed	0 closed; 1. PWM speed 2. PFM speed; 3. Pul open
4.3.2	Run Frq	1.2KHz to 60.0KHz
4.3.3	Max Open pul	Only for "Pul Open", used to set the number of pulses required when opening to the maximum
4.3.4	Close Over	When it comes to the position switch, if the

	Time	position switch is not detected to be effective within this time, it is considered that the position switch is faulty and the motor operation should be stopped
4.3.5	Open Dir Def	Only for "pul open", used to set the polarity of the direction signal
4.3.6	OUT1 Ho out	①[closed]/②[Open], used to set whether high-speed pulses are output through OUT1
4.3.7	OUT11 Ho out	①[closed]/②[Open], used to set whether high-speed pulses are output through OUT11

The output mode of the high-speed port is as follows

①PWM speed

PWM speed regulation is a mode in which the frequency remains constant and the speed is adjusted by changing the duty cycle. To work in this mode, the following parameters need to be set

1. [High-speed Mode] Set to "PWM Speed Regulation Mode";

2. [Operating Frequency] Set the frequency of the output pulse. For instance, if it is set to 20.0KHz, the output frequency will be 20.0KHz. During operation, the motor speed can be adjusted by changing the duty cycle of 20.0KHz.

②PFM speed

PFM is a method where the duty cycle is fixed at 50% and the speed is adjusted by changing the frequency. Just set the "High-Speed Mode" to "PFM Speed Control Mode".

The output frequency range of the PFM speed regulation mode is: 1.2KHz to 60.0KHz. The AMC501-A will automatically increase or decrease the output frequency to adjust the motor speed based on the difference between the real-time flow and the target flow, thereby achieving the purpose of regulating the flow.

③Pul open mode

The pulse opening mode controls the forward and reverse rotation of the motor by outputting the number and direction signals of pulses, thereby increasing or decreasing the opening of the discharge door and achieving the purpose of controlling the flow rate. To work in this mode, the following parameters need to be set

1. [High-speed Mode] Set to "Pulse Open Mode";
2. [Operating Frequency] Set the frequency of the output pulse;
3. [Maximum Opening Pulse Number] Set the number of pulses corresponding to the maximum opening;
4. [Definition of Opening Direction] Polarity of the direction signal. "Off-open" indicates the corresponding opening direction when the output is invalid, and "on-open" indicates the corresponding opening direction when the output is valid.
5. [Door Closing Timeout] Set the time limit for the door to reach the origin switch position to prevent the motor from continuously rotating and overcurrent when the origin switch is damaged.
6. Define a signal for the input switch quantity (the

discharge door is fully closed), and connect it to the origin sensor switch of the door closing.

3.4.4. IO test

IO test 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

Quit	4. IO				Home
4.1 In port	IN1 I1. Run/Stop(Pul)	IN2 I3. Zeroing	IN3 I4. Feed Valve On/Off	IN4 I5. Manual Emptyt	
4.2 Out port	IN5 I8. Clr Alarm	IN6 I10. Freq Cvt Fault	IN7 I23. Cut Closed-Inp		
4.3 Ho port					
4.4 IO test	OUT1 Q1. Run/Stop	OUT2 Q2. Freq Cvt ON/OFF	OUT3 Q3. Feed	OUT4 Q4. Feed Lack	
	OUT5 Q9. Alarm	OUT6 Q6. Feed Low Alarm	OUT7 Q5. Feed Enough	OUT8 Q10. Ration Ok	
	OUT9 Q11. Stir	OUT10 Q12. Disturb	OUT11 Q13. Freq Cvt Fault	OUT12 Q23. Cut Off	

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

For example:

The output port of OUT3 is connected to a relay. To test whether the output of OUT3 is normal, you can click the OUT3 button to switch the output state to effective. If the circuit is normal, you 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, you 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 function of switch quantities.

For example:

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

3.5. Module Set

3.5.1. Analog quantity

Quit		5. Module Set		Home		
5.1 Analog Hw	5.1.1	Out Analog1 Range	4-20mA	5.1.7	In Analog Range	4-20mA
	5.1.2	Out Analog1 Def Low	0.000	5.1.8	In Analog Fn	Closed
5.2 Sio	5.1.3	Out Analog1 Def Top	0.000	5.1.9	In Analog Filt	5
	5.1.4	Out Analog2 Range	4-20mA	5.1.10	In Analog Div	3
	5.1.5	Out Analog2 Def Low	0.000	5.1.11	In Analog Def Low	0.00
	5.1.6	Out Analog2 Def Top	0.000	5.1.12	In Analog Def Top	0.00

5.1.1	Out analog 1 range	0-5V 0-10V
-------	-----------------------	---------------

		4-20mA 0-20mA 0-24mA Custom voltage Custom current
5.1.2	Out analog1 def Low	When the "Output Analog Quantity 1 range" is set to "Voltage Custom", this parameter sets the lower limit of the custom voltage. When the "Output Analog Quantity 1 Range" is set to "Current Custom", this parameter sets the lower limit of the custom current
5.1.3	Out analog 1Def Top	When the "Output Analog Quantity 1 Range" is set to "Voltage Custom", this parameter sets the upper limit of the custom voltage. When the "Output Analog Quantity 1 Range" is set to "Current Custom", this parameter sets the upper limit of the custom current
5.1.4	Out analog2 range	Same as the analog output 5.1.1
5.1.5	Out analog2 Def low	Same as the analog output 5.1.2
5.1.6	Out analog2 Def Top	Same as the analog output 5.1.3
5.1.7	In Analog range	When there is an optional analog input, the setting is valid. Optional 0-5V, 0-10V, 4-20mA, 0-20mA, 0-24mA, custom voltage, custom current
5.1.8	In Analog Fn	When there is an optional analog input, the setting is valid.

		①Turn off.②Set the target traffic
5.1.9	In Analog filt	When there is an optional analog input, the setting is valid. 0to9, with 9 being the optimal filter
5.1.10	In Analog Div	When there is an optional analog input, the setting is valid It is used to set the resolution of the input analog quantity. The larger the graduation value, the more stable the input analog quantity, but the lower the resolution
5.1.11	In Analog Def low	When there is an optional analog input, the setting is valid. When the "Input Analog Range" is set to "Voltage Custom", this parameter sets the lower limit of the custom voltage. When the "Input Analog Range" is set to "Current Custom", this parameter sets the lower limit of the custom current
5.1.12	In Analog Def Top	When there is an optional analog input, the setting is valid. When the "Input Analog Range" is set to "Voltage Custom", this parameter sets the upper limit of the custom voltage. When the "Input Analog Range" is set to "Current Custom", this parameter sets the upper limit of the custom current

3.5.2. Sio

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. As shown in the following figure:

5. Module Set	
5.1 Analog Hw	5.2.1 RS232 Addr 1
5.2 Sio	5.2.2 RS232 Baudrate 38400
	5.2.3 RS232 Format 8-N-1
	5.2.4 RS232 Modbus-RTU Protocol -H
	5.2.5 RS485 Addr 1
	5.2.6 RS485 Baudrate 38400
	5.2.7 RS485 Format 8-N-1

5.2.1	RS232 addr	Set the communication address (slave number) of the device.
5.2.2	RS232 baud rate	Set the baud rate of serial communication
5.2.3	RS232 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
5.2.4	RS232 protocol	①[Modbus-RTU-H]: two-word data with the high word first. ②[Modbus-RTU-L]: the lower word of the two-word data comes first.
5.2.5	RS485 addr	Same as 5.2.1

5.2.6	RS485 baud rate	Same as 5.2.2
5.2.7	RS485 format	Same as 5.2.3
5.2.8	RS485 protocol	Same as 5.2.4

3.6. Functional parameters

3.6.1. Stir and feed struct

← Quit		6. Fn Para		Home →	
6.1 Stir And Feed Struct	6.1.1 Stir Set	Invalid-Valid	6.1.7 Feed Open Time	0.5	s
6.2 Others	6.1.2 Stir Front Time	0.0	s	6.1.8 Feed Open Alarm Time	2.0 s
	6.1.3 Stir Rear Time	0.0	s	6.1.9 Feed Close Alarm Time	2.0 s
	6.1.4 Stir Front Time Unit	s	6.1.10 Feed Open Dir Def	ON-Open	
	6.1.5 Stir Rear Time Unit	s			
	6.1.6 Feed Mode	Elec-Valve			

6.1.1	Stir set	①Valid-Invalid: When outputting the stirring waveform, output valid first and invalid later. ②Invalid-Valid: When outputting the stirring waveform, output invalid first and then effective.
6.1.2	Stir Front Time	Output the duration of the front part of the stirring waveform
6.1.3	Stir Rear time	The duration of the latter part of the output stirring waveform
6.1.4	Stir Front time Unit	Second (s), minute (m), hour (h)
6.1.5	Stir Rear time Unit	Second (s), minute (m), hour (h)
6.1.6	Feed mode	Three control methods: ① Solenoid valve,

		② motor turnover, ③ motor forward and reverse rotation. Please refer to the detailed instructions below the table.
6.1.7	Feed open time	After the feeding door leaves the closing point and this period of time passes, it is considered that the feeding door has been fully opened.
6.1.8	Feed open alarm time	When opening the door, if the closing point remains valid after this time, it is considered a failed door opening and an alarm is triggered.
6.1.9	Feed close Alarm time	When closing the door, if it still fails to reach the closing point after this time and is considered to be closing, an alarm will be raised.
6.1.10	Feed open Dir Def	①ON-open ②OFF-open

3.6.1.1 Feeding function

There are three control methods for the feeding mechanism: ① solenoid valve, ② motor turnover, ③ motor forward and reverse rotation. The following is a detailed explanation:

1. Solenoid valve

In this mode, only a switch signal is output. When feeding, a signal is output, and when feeding is turned off, the output signal stops

2. Motor turnover

Control the feeding mode of the ordinary motor to turn around:

2.1. It is necessary to define the IN7 feeding door fully closed as the motor closing origin switch.

2.2. After the system is powered on, if the feeding door is not at the closing origin position, the motor will be controlled to rotate to the closing origin position.

2.3. When closing the door, the motor will stop rotating once the material door reaches the closing origin. If the starting point for closing the door has not been reached after the [6.1.8 Feed open alarm time], the motor will stop rotating and an alarm will sound. The alarm content will be "Feeding Door closing origin fault". If the "6.1.8 Feed open alarm time" is set to 0, the alarm will not work and the motor will keep rotating until the door closing origin is detected.

2.4. When opening the door, the timing starts only after the material door leaves the closing point. When the timing reaches the [6.1.7 Feed open time], it is considered that the feeding door is fully open, and the motor rotation stops.

2.5. When opening the door, if the material door still does not leave the closing point after the [6.1.8 Feed open alarm time], it is considered that the door opening has failed. The motor rotation will stop and an alarm will sound. The alarm content will be "Material supply door opening failure". If the "6.1.8 Feed open alarm time" is set to 0, the alarm will not work and the motor will keep rotating until it leaves the closing point.

2.6. If an IN6 feeding door opening position switch is defined, the opening position detection will be adopted. The motor rotation will only stop after the opening position is detected. The [6.1.7 Feed open time] will not be effective.

2.7. If the IN6 feeding door is defined as fully open, after the output motor rotation signal, if the door opening position is still not reached after the [6.1.8 Feed open alarm time], the motor

rotation will stop and an alarm will be triggered. The alarm content will be "Feeding door opening origin fault". If the "6.1.8 Feed open alarm time" is 0, the alarm will not work and the motor will keep rotating until it reaches the door opening position.

2.8. If it is detected that the current position is at the closing origin, no closing command or action will be responded to.

2.9. If "IN6 feeding door in place" is defined and it is detected that it is currently in the door opening position, no door opening command or action will be responded to.

2.10. Since it is a control method for one rotation of the motor, the output direction signal is the same whether the door is closed or opened. However, the direction signal is definable. "Invalid - Open Door" indicates the direction corresponding to the door opening when the output is invalid, and "Valid - Open Door" indicates the direction corresponding to the door opening when the output is valid.

3. The forward and reverse rotation of the motor

The feeding method for controlling the forward/reverse rotation of a common motor

3.1. The IN7 feeding door must be defined as fully closed as the motor closing origin switch.

3.2. After the system is powered on, if the feeding door is not at the closing origin position, the motor will be controlled to rotate to the closing origin position.

3.3. When closing the door, the motor will stop rotating once the material door reaches the closing origin. If the starting point for closing the door has not been reached after the [6.1.8 Feed open alarm time], the motor will stop rotating and an alarm will sound. The alarm content will be "Feeding Door closing origin

fault". If the "6.1.8 Feed open alarm time" is set to 0, the alarm will not work and the motor will keep rotating until the closing origin is detected.

3.4. When opening the door, the timing starts only after the material door leaves the starting point for closing. When the timing reaches the [6.1.7 Feed open time], it is considered that the feeding door is fully open, and the motor rotation stops.

3.5. When opening the door, if the material door still does not leave the closing point after the [6.1.8 Feed open alarm time], it is considered that the door opening has failed. The motor rotation will stop and an alarm will sound. The alarm content will be "Material supply door opening failure". If the "6.1.8 Feed open alarm time" is set to 0, the alarm will not work and the motor will keep rotating until it leaves the closing point.

3.6. If an IN6 feeding door opening position switch is defined, the opening position detection will be adopted. The motor rotation will only stop after the opening position is detected. The [6.1.7 Feed open time] will not be effective.

3.7. If the IN6 feeding door is defined as fully open, after the output motor rotation signal, if the door opening position is still not reached after the [6.1.8 Feed open alarm time], the motor rotation will stop and an alarm will be triggered. The alarm content will be "Feeding door opening origin fault". If the "6.1.8 Feed open alarm time" is 0, the alarm will not work and the motor will keep rotating until it reaches the door opening position.

3.8. If it is detected that the current position is at the closing origin, no closing command or action will be responded to.

3.9. If it is defined that the IN6 feeding door is fully open and it is detected that it is currently in the open position, no opening

command or action will be responded to.

3.10. The door opening direction can be defined. "Invalid - Open" indicates the corresponding door opening direction when the output is invalid, and "Valid - Open" indicates the corresponding door opening direction when the output is valid.

3.6.1.2 Bridge erection stirring

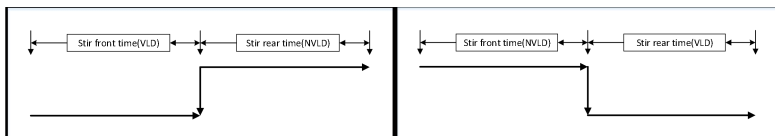
If it is necessary to output a signal to control the stirring at regular intervals and a waveform output is required, the bridge stirring function can be used. Continuous stirring does not require the use of this function. Just keep the signal on the wiring all the time to achieve continuous stirring. The stirring function is only effective when it is running; there is no output when it stops. The parameter description is as follows:

There are two ways of stirring mode:

- ① First invalid - then effective. When outputting the waveform, output it first as invalid and then as valid.
- ② First valid - then invalid. When outputting the waveform, the first output is valid and the second is invalid.

2. [6.1.2 The period before stirring] When the stirring mode is "first invalid - then effective", this time is the output invalid time. When the stirring mode is "effective first - ineffective later", this time is the output effective time.

3. [6.1.3 Stir Rear time] When the stirring mode is "first ineffective - then effective", this time is the output effective time. When the stirring mode is "effective first - ineffective later", this time is the output ineffective time.



3.6.2. Others

6. Fn Para	
6.1 Stir And Feed Struct	6.2.1 Manual Empty Percent 50 %
6.2 Others	6.2.2 ME 250
	6.2.3 PE 750
	6.2.4 Manual Empty Sum Closed
	6.2.5 Cut Off On Off Closed
	6.2.6 Cut Off Dly Close 0.0 s

6.2.1	Manual Empty percent	The speed at which materials are emptied
6.2.2	ME	Flow filtering specifically designed for the "metering mode", the larger the value, the better the filtering effect.
6.2.3	PE	Flow filtering specifically designed for the "metering mode", the smaller the value, the better the filtering effect.
6.2.4	Manual Empty Sum	Is the weight of the manually cleared material included in the total accumulation?
6.2.5	Cut off on off	On/off the material cutting function
6.2.6	Cut off Dly	After the operation stops, the signal

	close	of the material cut-off valve is closed only after this period of time.
6.2.7	Cut off close shift	After the signal to close the material cut-off valve is turned off, after this period of time, it is considered that the material cut-off valve has closed completely.

If material cutting is required at the discharge port, the material cutting function switch in parameter item 6.2.5 should be set to on. When starting the frequency converter, a cut-off signal will be output to open the cut-off valve. When the frequency converter is stopped, the material cutting signal will be closed, thus causing the material cutting valve to close. The cut-off valve can also be set with an origin switch: the cut-off valve is fully closed. The control process of the cut-off valve is shown in the following table:

The cut-off valve is fully closed	The closing stroke time of the cut-off valve	Control process
have	Greater than 0	After the cut-off signal is turned off and the origin switch is detected, it is considered that the cut-off valve is fully closed. 2. After the cut-off signal is turned off, if the closing duration reaches the [cut-off valve closing stroke time], it is considered that the cut-off valve is fully closed.
have	Equal to 0	Close the cut-off valve signal and then wait for the origin signal to be valid. If the origin signal remains invalid, it is always considered that the valve has not been closed properly.

no	Greater than 0	After the cut-off signal is turned off, if the closing duration reaches the [cut-off valve closing stroke time], it is considered that the cut-off valve is fully closed.
no	Equal to 0	Turn off the material cutting signal and assume that the material cutting valve is immediately closed in place.

3.7. Logic programming

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

The logic programming Settings interface is as follows:

← Quit		7. Logic Program		Home →	
7.1 Logic Program1	7.1.1 Logic Type	Closed	7.1.8 Out On Time	0.0	s
7.2 Logic Program2	7.1.2 trigger type	signal trigger	7.1.9 trigg cond	more than set value	
7.3 Logic Program3	7.1.3 Trigger Sign	Cuntem Tri Input	7.1.10 set value 1	0.000	kg
7.4 Logic Program4	7.1.4 Trigger In Port	NONE	7.1.11 set value 2	0.000	kg
7.5 Logic Program5	7.1.5 Logic Out Port	NONE	7.1.12 need stable	Closed	
7.6 Logic Program6	7.1.6 delay on	0.0 s			
	7.1.7 delay off	0.0 s			

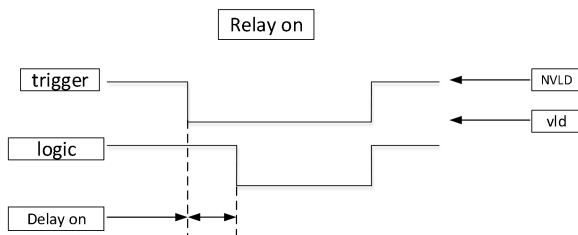
The following takes Logic Programming 1 as an example to explain the functions of each parameter.

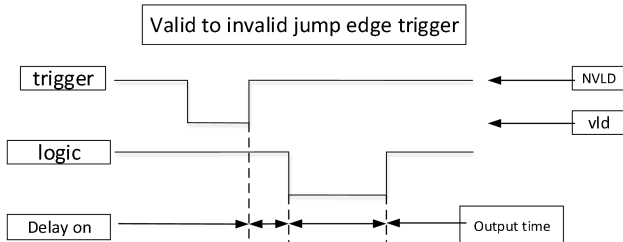
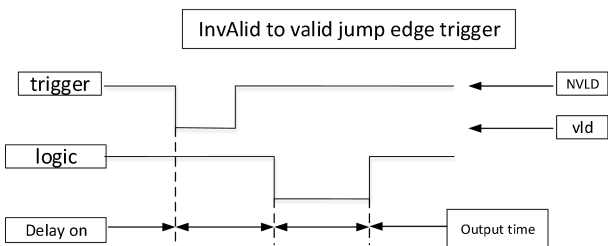
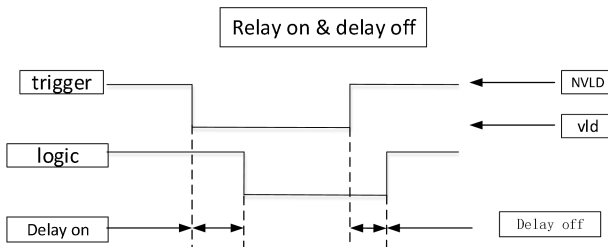
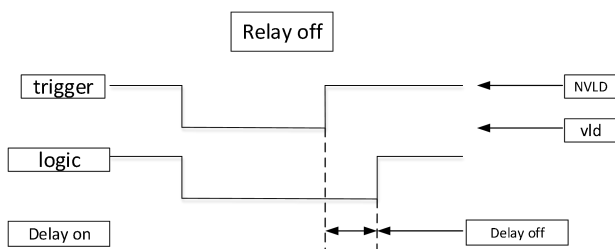
7.1.1	Logic type	Select the type of logic programming. ①[closed] : Disable this logical output
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		function. ②[Delay on] ③[Delay off] ④[Dly on dly off] ⑤[posedge Trig] ⑥[Negedge Trig] For detailed descriptions of the corresponding functions, please refer to
7.1.2	Trigger type	①[Signal Trigger] : Trigger the logic output through a certain signal. ②[Conditional Trigger] : Trigger the logical output by meeting a certain condition.
7.1.3	Trigger sign	Select the signal l used to trigger the logical output.
7.1.4	Trigger in port	It is valid when the trigger signal is set to a custom logical trigger input. Clicking can directly select to define the "logical trigger" signal to a certain input port (IN1 to IN7).
7.1.5	Trigger out port	Select this logical output signal to be defined to a certain OUT output port.
7.1.6	Delay On	The time when the logic output signal is delayed and connected.
7.1.7	Delay Off	The time when the logic output signal is delayed and disconnected.
7.1.8	Out on time	This parameter can be set when the logical type 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.
7.1.9	Trigg cond	Select the conditions that trigger the logical output. 1. [Weight greater than the set value] 2. [Weight less than the set value] 3. [Weight within the range] 4. [Weight outside the range]
7.1.10	Set value1	It is used to set the weight value corresponding to the trigger condition.
7.1.11	Set value 2	
7.1.12	Need stable	1. [closed] : The logical output can only be triggered when the weight meets the trigger conditions and needs to be stable. 2. [opened] : Logical output can be triggered once the weight meets the trigger condition, without the need for stabilization.

3.7.1. Logical output sequence diagram





For example:

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 mechanism to unload the material.

Settings are as follows:

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

【7.1.1 Logic Type 】 : Delayed connection

【7.1.4 Delayed connection Time 】 : 0s

【7.1.2 Trigger Type 】 : Conditional trigger

【7.1.11 Trigger Condition Setting 】 : Weight greater than the set value

【7.1.12 Set Value 1】 : 100kg

【7.1.3 Logical Signal Output Port 】 : OUT10

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

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

【7.2.4 Delayed connection Time 】 : 2 seconds

【7.2.8 Output valid Time 】 : 3 seconds

【7.2.2 Trigger Type 】 : Signal trigger

【7.2.6 Trigger Signal 1 Setting 】 : Logic output 1

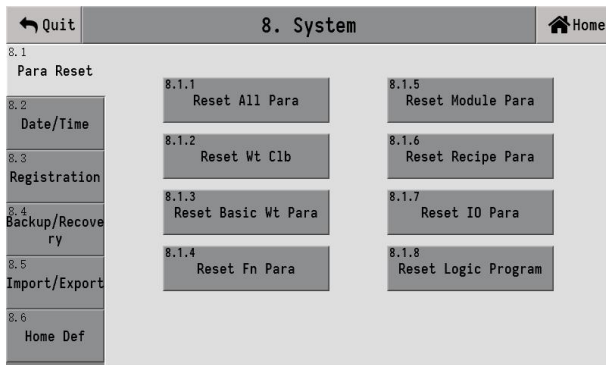
【7.2.3 Logical Signal Output Port 】 : OUT11

3.8. System

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

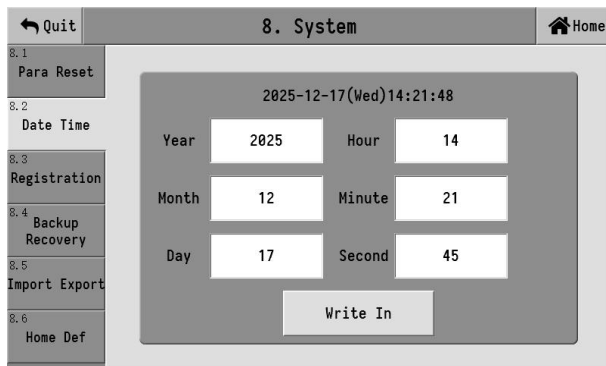
3.8.1. Parameter reset

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



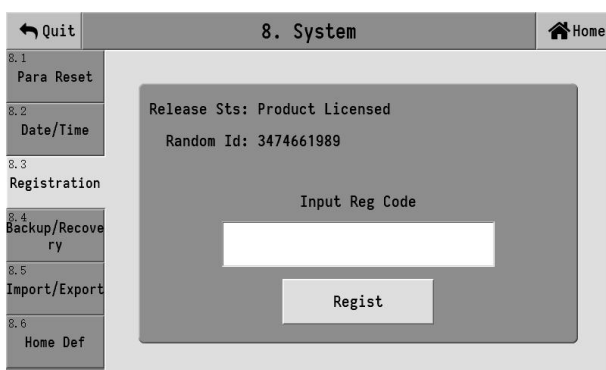
3.8.2. Time and Date

The time and date of the controller can be modified.



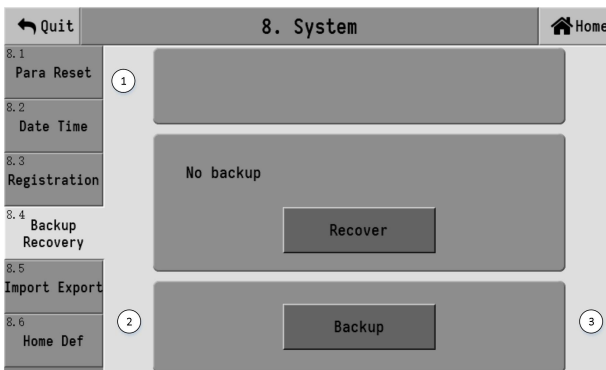
3.8.3. Product registration

Product usage registration Settings.



3.8.4. 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. To prevent accidental operation, when entering the parameter backup and restore interface, the **backup** and **recover** button are disabled by default. Special operations are required to enable the backup and restore 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 ③ click the position three times. The backup and restore backup functions can be enabled.



3.8.5. Data import and 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 you need to export. After inserting the USB flash drive, click **UDisk Export** to export the selected items to the USB flash drive.

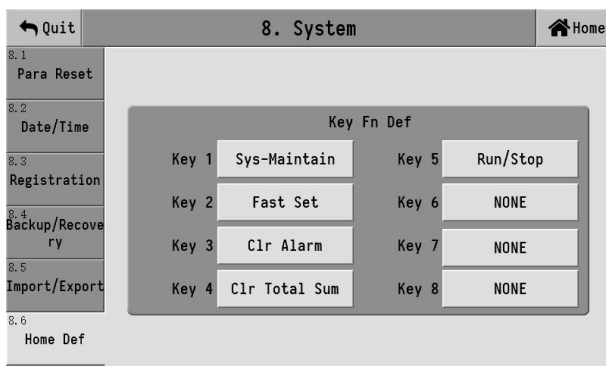
Data import operation

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 you need to import and click **UDisk Import**.



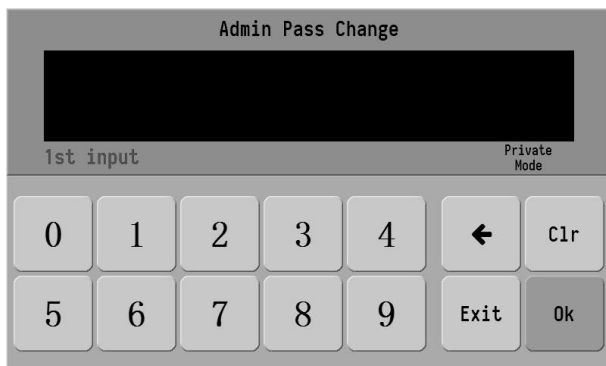
3.8.6. Home page Definition

On this interface, you can define the function keys of the main interface. Up to 7 keys can be defined.



The key function options include: Undefined, system maintenance, common Parameters, alarm Clearing, Zero Clearing, cumulative clearing, Run/Stop, and manual material clearing.

3.9. Administrator password modification

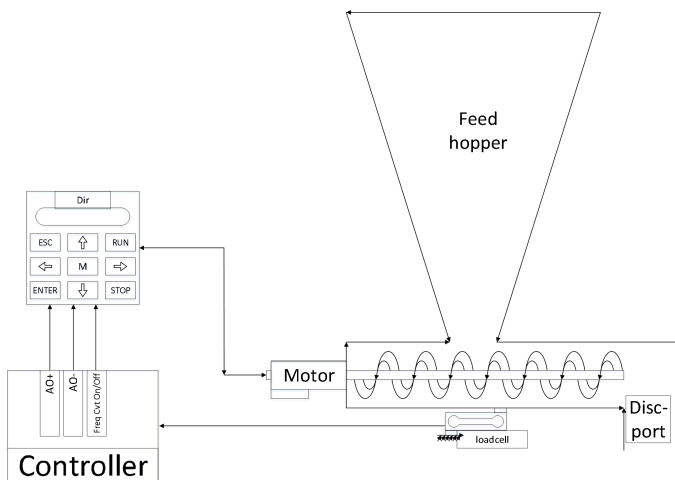


Just enter the password twice to complete the password modification.

iv. Principle and function description

4.1. Structure diagram and principle

The basic system structure of the weightless scale is shown in the following figure:



The working principle is as follows:

After starting up and running, the AMC501-A outputs analog quantities to the frequency converter, which controls the frequency converter to drive the motor to rotate. The rotation of the motor drives the screw conveyor, causing the material to flow out of the storage hopper and continuously reducing its weight.

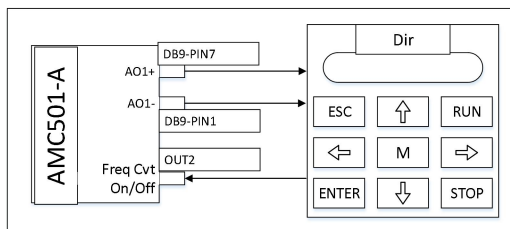
2. AMC501-A calculates the real-time flow based on

the reduced weight;

3. Compare the real-time flow rate with the target flow rate. If the real-time flow rate is greater than the target flow rate, reduce the analog quantity and lower the motor speed to decrease the discharge speed. If the real-time flow rate is less than the target flow rate, increase the analog quantity and raise the motor speed to increase the discharge speed. By repeatedly adjusting in this way, the purpose of making the real-time flow equal to the target flow is achieved.

4.2. Wiring of frequency converter

The wiring diagram of the weightlessness instrument and the frequency converter is as follows:



If a fault is detected during startup, a prompt will be given and the operation cannot be started.

When a fault is detected during operation, the machine will automatically shut down and an alarm will sound.

v. Trouble shoot 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	There is no	If there is no response when starting and

	response when you press the start button to run	running, the possible reasons are as follows: 1. No target traffic was set; 2. (Inverter fault) Input is valid; 3. (Run _ level) input invalid; 4. (Allow to Run) Input invalid;
--	--	---