GENERAL MEASURE

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M04-5

User's Manual

Standard: GB/T 7724-2008

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CONTENT

1. Outline

M04-5 bulk accumulation controller is a weighing control instrument specially developed for discontinuous automatic accumulation scale. The controller has the characteristics of moderate size, high precision, powerful function and simple and practical operation. It can be widely used in chemical industry, grain, port and other industries that need bulk metering equipment.

1.1 Functions and Features

➤ Full English display interface, make the operation more intuitive and simple
➤ **20 ON/OFF** data input and output (8 in and 12 out), which can be defined by user
➤ Function of ON/OFF data testing，convenient equipment debugging
➤ Full automatic 2 – speed feed control
➤ 20 recipes can be stored for different weighing capacity.
➤ USB interface facilitates import and export of various parameters
➤ The feeding control function facilitates the control connection between the bulk balance and the front-end feeding equipment
➤ Digital filtering function
➤ Automatic zero tracking function
➤ Time/date function
➤ Secondary user identity Settings
➤ Dual serial port, external serial printer, computer or second monitor (SIO expansion board is optional)

1.2 Front Panel Description
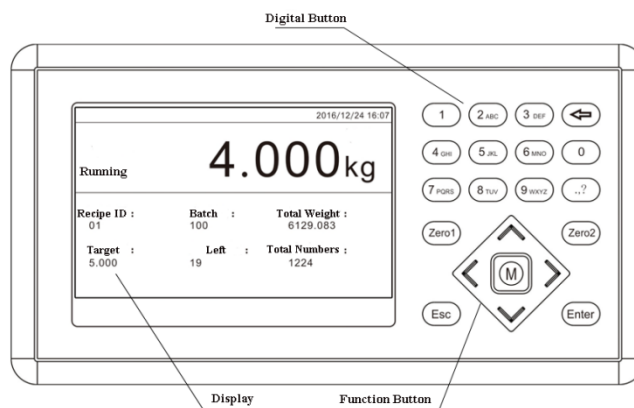
◆ Display interface: display instrument value, status, accumulation and partial formula information.
◆ Numeric keys: for data entry and quick parameter selection.

◆ Function key:

[Zero1] reset key, used for data reset.

[Zero2] clear all formula accumulation or clear all user accumulation in the accumulation interface.

[M] Menu key, used by Technician and Administrator to enter the menu list of setting parameters.

[Esc] exit key, used to exit the current interface and return to the parent interface.

[Enter] to confirm the current operation.

1.3 Rear Panel Description
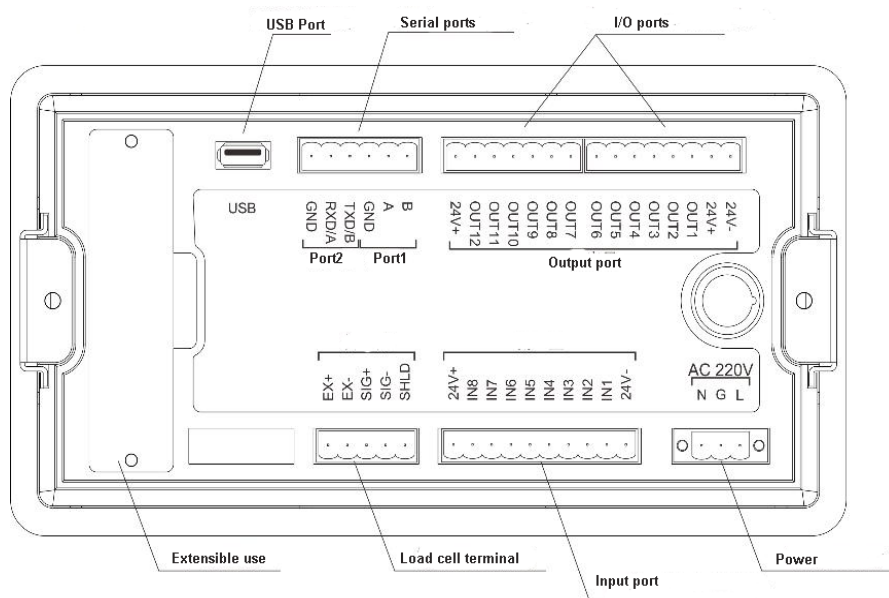
1.4 technical specifications

1.4.1 General specifications

Power source: AC90~260V50Hz(or 60Hz) ±2%

Power filter: included

Operating temperature: -10 ~ 40℃

Maximum humidity: 90% r.h. no dew

Power consumption: about 15W

Physical size: 218×118×76.5mm

1.4.2 Analog part

Sensor power supply: DC5V 125mA（MAX）

Lose the impedance: 10 m Ω

Adjustment range: 0.002 ~ 15.625mV（sensor sensitivity fixed at 3mV/V）

Input sensitivity: 0.02uV/d

Input range: 0.002 ~ 15.625mV

Transformation formula: sigma-delta

A/D conversion speed: 120, 240, 480, 960 times/s

Nonlinearity: 0.01% F.S

Increasing drift: 10PPM/℃

Maximum display accuracy: 1/100000

1.4.3 Digital part

Display: 5-inch TFTLCD 800x480 LCD

Negative number display: ″-″

Overload display: Chinese: ″weight overrange/sensor signal too small″

Decimal position: 5 options

2. Installation

2.1 General Principle

M04-5 bulk accumulator controller USES 220V 50Hz ac power supply with protective floor.If there is no protective ground; additional grounding is needed to ensure safe and reliable use.

Since the input signal of the sensor is a small analog signal, which is sensitive to electronic noise, the shielded cable should be used for the transmission of the signal, and it should be laid separately from other cables, not to say tied together.Signal cables should be kept away from ac power.

Note: do not connect the instrument ground wire directly to other equipment.

When install the M04 bulk accumulator controller, firstly make the hole in the proper position of the control box according to the opening dimension diagram in the last chapter of this manual, then remove the cuttings on both sides of the controller, load the controller from the front of the control box, load the cuttings on both sides from the back and lock the fixing screw.See the figure below.

Aperture Of Control Box　　　　Insert Controller　　　　Tighten Strips Of Both Sides
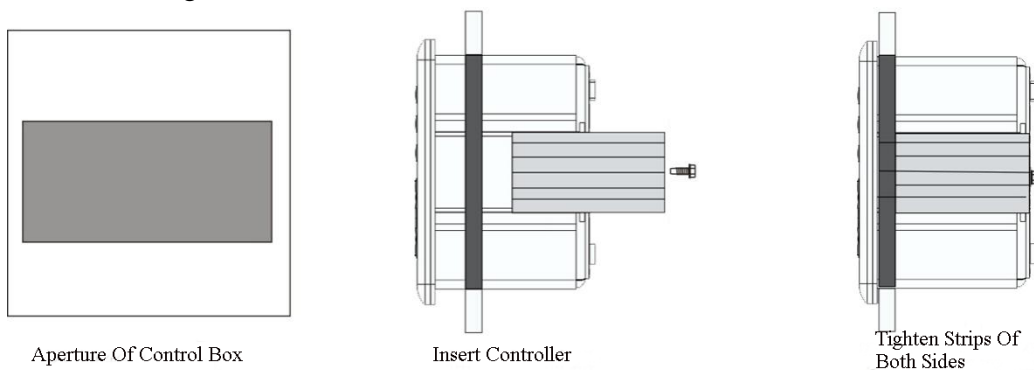
2.2 Load Cell Connection

The M04-5 bulk accumulation controller can be connected to a resistance strain bridge sensor.When the six-wire sensor is selected, SN+ and EX+ of the sensor must be shorted, and SN- and EX- must be shorted.

EX+: Excitation+　**EX-**: Excitation-　**SN+**: Sense+　**SN-**: Sense-　**SIG+**: Signal+　**SIG-**: Signal-
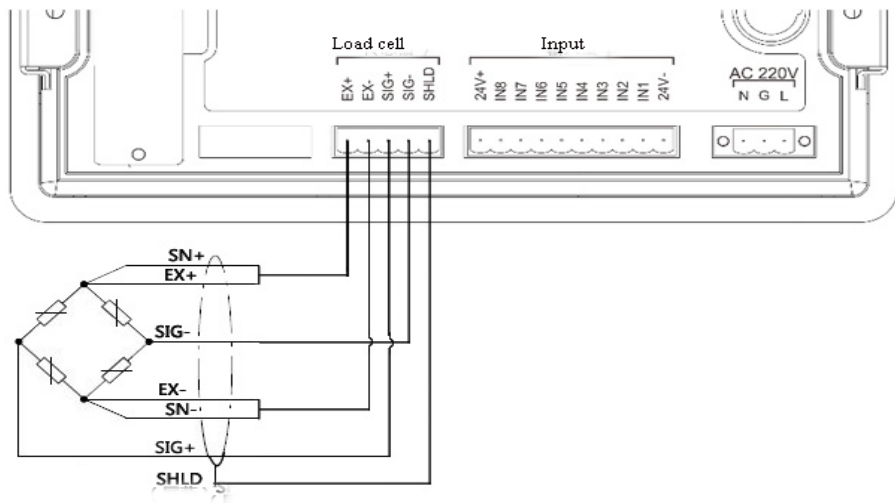
2.3 I/O Module Port Connection

M04-5 Controller uses optoelectronic isolation technology to transfer the ON/OFF data. This needs 24V DC power supply that is provided from outside, through the 24V+ and the 24V-. The I/O signal input is low level effective. The output is open-collector output. The driving current can reach 500mA.
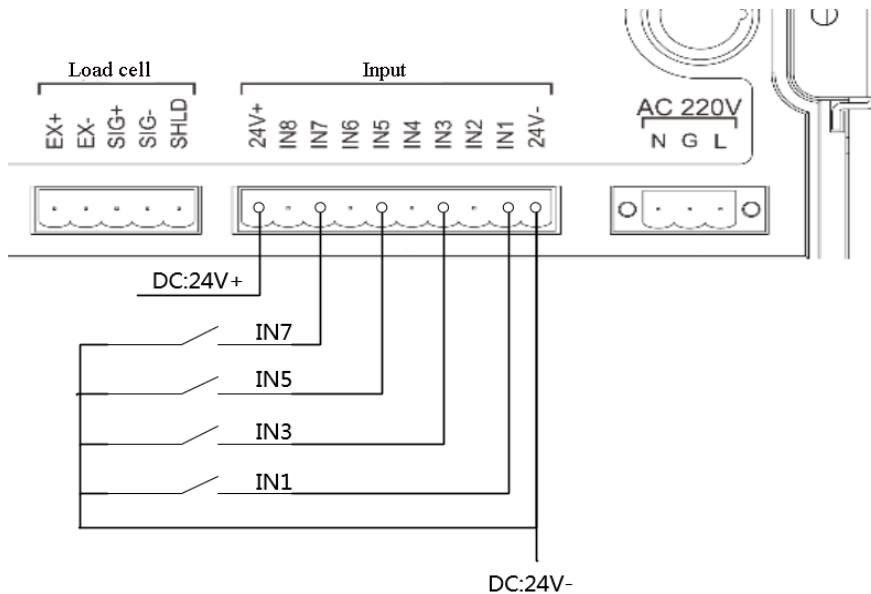
Figure: Input Schematics (Take IN1, IN3, IN5, IN7 as example)
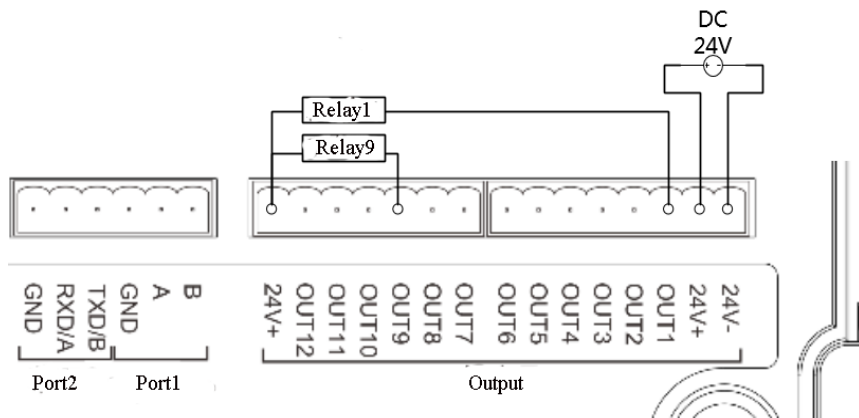
Figure: Input Schematics (Take OUT1, OUT9 as example)

I/O of M04 bulk accumulator controller is a user-defined way to facilitate wiring and some special applications. Please refer to section 4.9 for the content of I/O Module.

2.4 Power Supply Connection

M04-5 bulk accumulation controller uses **90~260V, 50Hz** ac power supply with protective floor**.** The connection is shown as follows:

L-Live Wire   **G**-Ground Wire   **N**-Null Wire
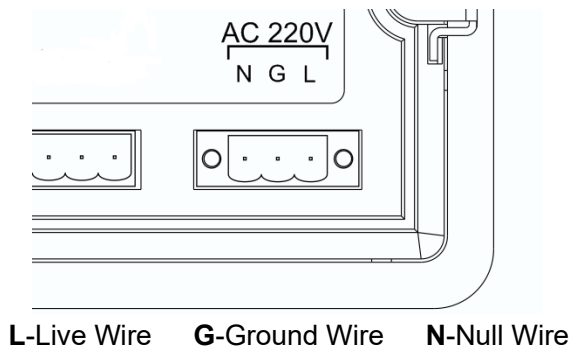
2.5 Serial Port Connection

M04-5 can provide two serial communication interfaces, as shown in the figure below.One serial port is RS485 (terminal ports A, B and GND);Serial port two is RS232, RS 485 optional, factory default is RS232, optional RS485 need to order declaration (terminal RXD/A, TXD/B, GND).Serial port support: MODBUS protocol, command mode, continuous mode and print format
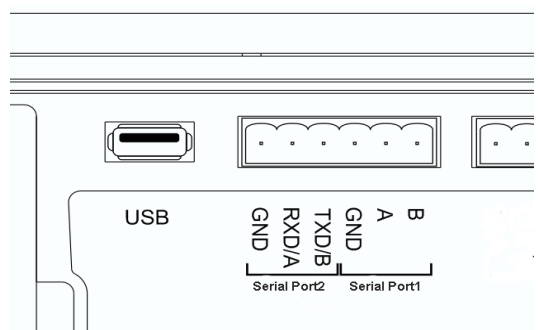
Connection diagram of instrument and computer:
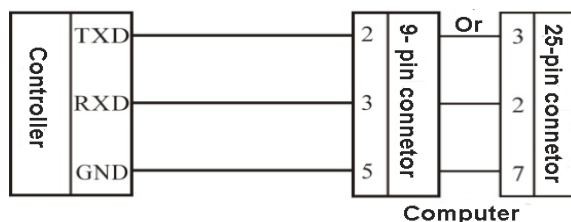
Connection between instrument and a Host computer（RS 232 mode）
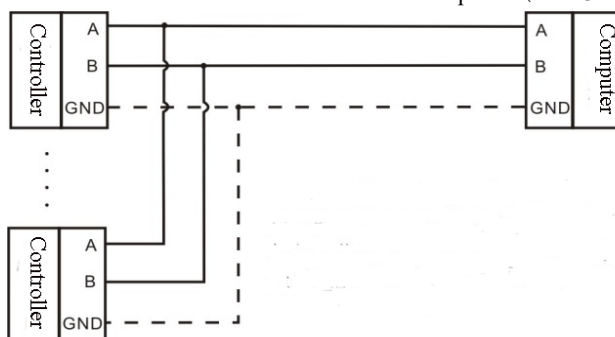
Connection between instrument and a Host computer（RS 485 mode）

2.6 Ethernet connection

The network interface board configured with M04 has only one network communication interface, which is connected with **RJ-45** crystal head to communicate with the host computer or PLC.But it supports two upper computer or PLC to access the controller at the same time.The optional network port shall be declared when ordering.

After selecting Ethernet port, you can see the Ethernet port menu for setting IP address and port number in the communication parameters menu.Modbus-tcp communication can be carried out by setting the IP address and port number.

Using Modbus/TCP communication protocol, Modbus/TCP communication can be used in the upper computer to modify the network port parameters of the controller (including IP address, Mac address, port number, etc.). This modification is not immediately effective, and the controller needs to be restarted.It is also possible to modify the contents of the Ethernet port (such as IP address, Mac address, port number, etc.) through serial communication, and this modification is effective immediately.

After the network cable is inserted, the green indicator light in the port slot is log on, indicating that the network cable is well connected, and the orange indicator light is flashing, indicating that the network card has received network data.When Modbus communication is conducted, the orange light flashes more frequently, indicating that Modbus/TCP communication is normal.But when Modbus communication is interrupted, the orange light flashes very slowly.

3. User Permission Description

In order to prevent improper operation of the instrument by personnel, M04 bulk accumulation controller provides 3 levels of authority (operator, Technician and Administrator) to choose: Administrator can carry out all operations on the instrument.

Operator and Technician limits are as follows:

permissions	Operating content
Operator	Access to the main menu is not allowed. Only functions defined by shortcuts are allowed.
	It is only allowed to set the mode of receiving and dispatching and the total quantity of dispatching in the interface of accumulation and receiving and dispatching.
	Through the shortcut key to enter the parameters interface, only allowed to modify the formula parameters, communication parameters, IO test, other parameters can only be viewed.
	You can modify parameters defined directly by the shortcut key.
	System information interface only allowed to enter the "view version", modify the time.
Technician	"Reset and backup" and "USB data import" under the operating system information interface are not allowed.
Administrator	**Allow all operations.**

- ◆ After the meter is powered on, log in with the permission of "operator" by default;
- ◆ Press the number 0 key to switch to login.Operator and Technician login initial password is 000000 (6 0);
- ◆ The level above Technician can set the automatic login user;
- ◆ User password can be managed under "user management" to achieve hierarchical management of permissions.

4. M menu

Technician and the Administrator press [M] to enter the parameter menu and inquire and modify the parameters.

Description

Administrator	
1.Recipe Para	Indicator has 20 recipe memories from 01 to 20.
2.Working Para	Each recipe includes many parameters.
3.Motor Para	User can accordingly set and edit this value
4.Calibration	
5.ACUM D/R Mode	Recipe ID
6.I/O Module	01
7.COM Para	Target
8.User Management	0.00kg
9.System Info	Button:1-Choose Recipe

Items   Informatiom

The menu interface of M is shown in the figure above. The left side is the list of parameter items, and the right side is the brief description of parameter items and part of parameter item information.

- ◆ 【▲】and【 ▼ 】can switch the selection of parameters.
- ◆ Press [Enter] to enter the current parameter to view and set the attribute parameter information.
- ◆ Press [Esc] to exit the current interface and return to the parent interface.

Parameters	Parameters list	Description
1.Recipe Para	Target	Set the quantitative correlation weight value
	Feeding Timer	Set the quantitative correlation time item
	Over&Under	Set the Over&Under weight, mode and other relevant parameters
	Flowrate Function	Set the target flow, flow alarm, etc
	Motor Group ID	Set the Recipe ID for Motor Cfg ID
2.Working Para	Basic Parameter	Set the basic parameters of the controller
	Advanced Parameter	Set the advanced parameters of the controller
3.Motor Para	Feeder Parameter	Motor set up Feeder Paremeter
	DISC Parameter	Motor set up DISC Parameter
4. Calibration scale	Weighing Para	Set the unit, decimal point, Capacity and other parameters
	Calibration Zero	Calibrate the zero point of the scale

	Calibration Weight	Calibrate the controller weight value
	Theoretical calibration	Zero and gain calibration without weight
5.ACUM D/R Mode	Total ACUM	View, clear, print the total cumulative information, view the total cumulative system
	Recipe 1-10	View, clear ,print the cumulative information of 1-10 formula package
	Recipe 11-20	View, clear ,print the cumulative information of 11-20 formula package
	User ACUM	View, clear and print the accumulated information of each user
	Scale Mode	Set the In&Out mode, Out Acum, check In&Out ACUM
6.I/O Module	Output Define	Output port definition.
	Input Define	Input port definition.
	I/O tests	Test the connection of each port is normal
7.Com Para	COM-RS485	Set serial port 1（RS485）related parameters
	COM-RS232/RS485	Set serial port 2（RS232/RS485）related parameters Refer to 4.5 for serial port 2 communication mode
	Print Setting	Set print related parameters
8.User Management	User List	Switch User ID
	User Edit	Edit User Permission, Password etc
	Auto Login	Display power on auto login ID
9.System info	Review Version	View software version and set system time
	Password Management	Password management of all parameters（the password switch of the scale must be on）
	Reset&backup	All parameters are restored to factory Settings and data backup
	Data Import(USB)	Import all kinds of parameters from outside, formula, calibration, I/O module , communication and shortcut key
	data export(USB)	From the controller to export work, formula, calibration, I/O module, communication, shortcut key all kinds of parameters
	Shortcut Config	Define the number key function item
	Others	Switch language mode, optional port（currently not supported）, adjust screen brightness, and set screen saver time.

4.1 Recipe Para

Administrator	
1.Recipe Para	Indicator has 20 recipe memories from 01 to 20.
2.Working Para	Each recipe includes many parameters.
3.Motor Para	User can accordingly set and edit this value
4.Calibration	
5.ACUM D/R Mode	Recipe ID
6.I/O Module	01
7.COM Para	Target
8.User Management	0.00kg
9.System Info	Button:1-Choose Recipe

When move to recipe parameter interface:

◆ Press digit 1 and display recipe No., input 1~20 to revise recipe No.

◆ Press [Enter] to enter the formula parameters under the current formula number.

In the formula parameters interface (under the menu or the shortcut default number key 9) :

◆ Use [◀] key and [▶] key to switch formula parameter items (quantitative value, quantitative timer, over and under error, etc.).

◆ Use [▲] key and [▼] key to switch the corresponding subitem under the parameter item.

◆ Press [Enter] to pop up the dialog box of parameter information under the current subitem, and set and modify the parameters of the subitem.

◆ Press [Esc] to exit the formula parameters interface.

Recipe Item	parameter	Description
Target	Used to set package weight value related parameters	
	1.Target	Quantitative target value
	2. Co-Feed-ing Remains	In the quantitative process, weighing value ≥ target value – Coarse Flow Remains, coarse feeding closed.
	3. Free Fall	In the quantitative process, weighing value≥ target value – free fall value, fine feeding is closed.
	4. Near Zero	In quantitative process, if the weighing value ≤ zero zone, starts **t5** discharge delay timer.
Feeding Timer	Used to set the delay time related parameters of the feeding process	
	1. Filling Start Delay	Feeding delay time: at the beginning of the quantitative process, after the delay time, the meter will judge the stability and clear the zero (if it is not stable, wait for the stabilization and clear the zero again), and then start the feeding process;
	2.COMP In-hibit Timer(Co-F)	Time comparisons are prohibited. After the end of " Filling Start Delay ", in the " COMP Inhibit Timer(Co-F)", coarse feeding is valid;
	3. COMP.	Time comparisons are prohibited.

	Inhibit Timer(Fi-F)	After the end of the coarse feeding, in the "COMP. Inhibit Timer(Fi-F)", fine feeding is valid.
	4.Result Waiting Timer	After the fine feeding, controller enters into the "Result Waiting Timer", and after the "Result Waiting Timer ", the stability is judged and the current weight is recorded, and then it enters into the OVER/UNDER detection.If the detection is closed, it is not necessary to enter the Stable judgement process directly after the fixed value is finished.
	5. Discharge Delay Timer	When the weight in the weighing bucket is less than the value of zero zone, start "Discharge Delay Timer". When the time arrives, the controller will turn off the discharge signal.
Over/Under	It is used to set the alarm and remind related parameters	
	1. Over&Under Check ON/OFF	"On/off" is optional, and when this parameter is set to "on", the quantitative process will judge the error.
	2. Over&Under Pause ON/OFF	"On/off" is optional. If "on" is set to "on", the controller will be suspended waiting for the user to process when there is overshoot or undershoot in the quantitative process. Press [Esc] to clear the alarm and continue the quantitative process, or input emergency stop signal to clear the alarm and return to the stop state.
	3. Over&Under Alarm Timer	The over /under detection switch is turned on. After the end of "Result Waiting Timer", the controller bucket is stable, detection is carried out and the over/under alarm time is output.
	4.OverLimitation	In the quantitative process, weighing value $\geqslant$ target value +over value, it is OverLimit Value. Initial value: 0.
	5.Under-Limitation	In the quantitative process, weighing value $\leqslant$ target value – under value, it is UnderLimit Value. Initial value: 0.
Flowrate Function	Used to set flow function adjustment parameters	
	1. Target flowrate ON/OFF	Target flow function ON/OFF
	2. Target flowrate	After the target flow function ON/OFF is turned on, the "target flow value" is set. The controller will calculate and convert the target flow value and target value to calculate the time needed for a feeding process. Then the meter will start unloading after the calculated time arrives before starting unloading.
	3.Flowrate Low Alam ON/OFF	ON, if the actual discharge interval continuously exceeds the calculated discharge interval more than the "insufficient flow alarm statistical times", the alarm will be given.If closed, no alarm will be given.
	4. Flowrate Low Alam Trigger Count	After the alarm function ON/OFF is turned on, the feeding interval time is timeout for several consecutive times, and the frequency reaches the set value, and the controller outputs the alarm signal of "insufficient flow". Set to 0, no

		alarm.
	5. Flowrate Low Alam Adjust Count	Automatically adjust the function ON/OFF after insufficient flow (discharge interval timeout) The ON/OFF is turned on. If there is a timeout at the unloading interval, the controller will be adjusted automatically to shorten the unloading interval until the timeout is offset.
Motor Group ID	Used to set the relevant parameters of the feeding power unit number used in the current formula	
	1. Motor Group ID	The feeding motor parameter group number used in this formula.

4.2 Operating Parameter

In the operating parameters interface (under the menu or the default shortcut number key 1 to enter) :

◆ Use [◀] key and [▶] key to switch working parameters (basic parameters, advanced parameters).

◆ Use [▲] key and [tio] key to switch the corresponding subitem under the parameter item.

◆ Press [Enter] to pop up the dialog box of parameter information under the current subitem, and set and modify the parameters of the subitem.

◆ Press [Esc] to exit the working parameters interface.

Items	Parameters	Description
Basic parameter	1. Flowrate calculation window	Flow calculation window length.
	2. Feeding mode	Combination feeding/separate feeding is optional; Initial value: combined feed. Combined feeding: fast and slow feeding at the same time; Slow feed time slow feed mouth feed. Separate feeding: quick feeding at quick feeding port; Slow feed time slow feed mouth feed.
	3. Power-Up Zero	ON/OFF is optional, when "on": the power on the controller will automatically perform zero clearing operation (the weight in the scale bucket meets the zero clearing range).Initial value：off.
	4. Manual DISC Add to ACUM	ON/OFF is optional, set as on: manual discharge is counted into the accumulation under stop state.Initial value: off.
	5. Result Holding ON/OFF	On/OFF optional.Set as on: the weight display remains unchanged after the setting time, and the weight changes again after unloading. OFF: turn off the constant weight holding function.
	6. Manual clear ACUM when start	On/off optional, set to on: when starting, manually clear the last collection and shipment accumulation before starting again. Off: the meter will automatically clear the accumulation of

			last receipt and shipment when starting.
Ad-vanced parame-ter	1. Stop Start Filter		**1.** The weakest filtering effect;9. The filtering effect is the stronge**st.**Initial value：5. Range：1 to 9.
	2. Feeding Fil-ter		Filtering parameters during operation：9：the filtering effect is the strongest. Initial value：4. Range：1 to 9.
	3.ADC Sam-pling Rate		A/D sampling rate, 120 times/SEC, 240 times/SEC, 480 times/SEC, 960 times/SEC optional, initial value: 480 times/SEC.
	4. Processing Filer ON/OFF		On/off is optional, secondary filtering is performed on the basis of digital filtering. Initial value：off.
	5. DISC Filter		Filtering parameters during unloading：9：the filtering effect is the strongest. Initial value：3. Range：1 to 9.
	6. Result Wait-ing Filter		Filter parameters：9：the strongest filtering effect. Initial value：4. Range：1 to 9.
	7. Stable Judge Timer		Initial value: 0.3s;Range: 0.1 ~ 9.9
	8. Stable Judge range		During the stabilizing time, the range of weight variation is within this setting value and the meter is judged to be stable. Initial value：1；Range：0 ~ 99（d）.
	9. Zero Trace Timer		Initial value: 2.0s;Range：0.1 ~ 99.9
	10. Zero Trace range		If the weight value is in this range, the meter will reset automatically. Zero zero tracking is not performed. Initial value：1；Range：0 ~ 9（d）cleared range.
	11. Zerot Range		Cleared range. Initial value：50%；Range：1% to 99%（percentage of full range）.
	12. Auto Zero Interval		How many times after the completion of the packaging process for a zero. When the first packaging process enters the running state, the meter is not reset.
	13. Stable Judge timer In Run		During the operation, it is necessary to judge the stable step （such as zero clearance interval to, overfault function）, and allow the maximum time to wait for stability. If there is no stability beyond this time, the instrument will consider the current weight as the stable weight, continue the following steps, and alarm "judge the stable timeout".

4.3 motor para

In the working parameters interface (menu or shortcut default number key [.,?])Enter the) :

◆ Use [◀] key and [▶] key to switch working parameters (feeding parameters, un-loading parameters).

◆ Use [▲] key and [▼] key to switch the corresponding subitem under the parameter item.

◆ Press [Enter] to pop up the dialog box of parameter information under the current subitem, and set and modify the parameters of the subitem.

◆ Press [Esc] to exit the working parameters interface.

Items	parameter	Description
Feeding parameters	1. Feeding control mode	Initial value: pneumatic: pneumatic control of feeding door opening and closing; Electric, single limit: control the opening and closing of feeding door by ordinary motor (1 limit: closing limit)
	The following parameters are the feeding parameters of the "electric, single limit" mode	
	2. Feeding motor parameter group no	Feeding motor parameter group no. 0-4
	3. Running time of material door opening to quick add position	The time it takes for the feed door to open to the add position
	4. Running time of material door to slow add position	The time required for the feed door to open to the slow feed position
	5. Feed door closing timeout	When the feeding door is closed, the feeding motor will be stopped and the alarm will be raised Note: no timeout judgment is performed when set to 0.
	6. Feeding door closing in position signal type	When the signal is effective, the feeding door is in place: when the input signal is effective, the feeding door is considered to be in place; When the signal is invalid, the feeding door is in place: when the input signal is invalid, the feeding door is considered to be in place.
Discharge parameters	1. Unloading control mode	Initial value: pneumatic: pneumatic control of unloading; Motor positive and negative rotation, single limit: normal motor positive and negative rotation single limit control unloading (1 limit: close limit); Motor positive and negative, double limit: normal motor positive and negative double limit control unloading (2 limits: door closing limit, door opening limit); Motor rotation once and single limit: normal motor one-way rotation once and single limit control unloading (1 limit: close limit)
	The unloading control mode is set as "pneumatic", and the parameters in item 5/6 can be set; Discharge control mode is set to "motor positive and negative rotation, single limit", the parameter of item 2/3/5/6 can be set; Discharge control mode is set to "motor positive and negative rotation, double limit", the parameters of item 3/4/5/6 can be set; Discharge control mode is set to "motor rotation once, single limit", the parameter of item 2/3/5/6 can be set;	
	2. Output time of discharge motor	Discharge motor door signal output time

	door signal	
	3. Unloading and closing timeout	Unloading shutdown timeout When discharging and closing the door, if the signal of unloading and closing the door in place is not detected after this time, the output signal of unloading and closing the door will be closed and the alarm will be given Note: no timeout judgment is performed when set to 0.
	4. Unloading door timeout	Discharge gate timeout When the unloading door opening action is performed, if the unloading door arrival signal is not detected after this time, the unloading door output signal is closed and the alarm is given Note: no timeout judgment is performed when set to 0.
	5. Unloading door closing in place signal type	When the signal is valid, the unloading door is in place: when the input signal is valid, the unloading door is considered to be in place; When the signal is invalid, the unloading door is in place: when the input signal is invalid, the unloading door is considered to be in place.
	6. Unloading limit real-time detection switch	Opening: the unloading door shall be detected in real time, and the door shall be closed if not at the closing limit; Off: unloading door testing is only conducted during startup and unloading.

4.3.1 Description of motor feeding process

1. The feeding control mode is set as "motor, single limit" mode to control the feeding Idoor ON/OFF: the I/O Module involved are Filler Open (O21), Filler Close (O22), Filler Gate Closed (I25).

Take the coarse and fine feeding process as an example:

● Coarse feeding process: first, the output of (O21) Filler Open is valid. The valid time is the "Material door open to coarse feeding position running time", and the coarse feeding process begins.

● Fine feeding process: material weight in the hopper≥target value – coarse flow remains , the output of O22 door closing signal is valid, and the valid time is " Material door open to coarse feeding position running time-- Material door open to fine feeding position running time ".

● Feeding close: material weight in the hopper≥ target valid-free fall, the output of O22 closing signal is valid until Filler Gate Closed (I25).

● Note: if the closing process time exceeds the set closing timeout of the feeding door and the controller has not detected the Filler Gate Closed (I25), the controller will stop the output of the Filler Close (O22) and alarm.After clear the alarm, continue to output the door-closing signal.

4.3.2 Description of motor discharge process

1. "Discharge control mode" is set as "motor positive and negative rotation single

limit" mode to control discharge: the I/O Module involved are DISC Gate Open (O23), DISC Gate Close (O24) and DISC Gate Closed (I27).

Take discharge process as an example:

● Discharge gate open process: at the beginning of the discharge process, the DISC Gate Open signal (O23) of the controller controls the discharge motor to rotate in the direction of discharge and door opening, and continuously sets the output time of the discharge motor's door signal, then close the DISC Gate Open (O23) output.

● Discharge gate close process: after discharge is completed, DISC Gate Close signal (O24) is output, and control the discharge motor to rotate in the direction of discharge and closing until the DISC Gate Closed signal (I27) is detected to be in place after DISC Gate Close (O24). At this point, the discharge door is in the closed state.

● Note: if the closing time of the discharge door exceeds the set timeout time of the discharge door, and the controller has not detected the signal of the DISC Gate Closed (I27), then the controller will stop the output (O24) and alarm.After the alarm, continue to output the door closing signal.

2. "Discharge control mode" is set as "motor positive and negative rotation double limit" mode to control discharging: the I/O Module involved are DISC Gate Open (O23), DISC Gate Close (O24), DISC Gate Opened (I26), DISC Gate Closed (I27).

Take discharge process as an example:

● Discharge door open process: at the beginning of the discharge process, the output discharge signal (O23) of the controller will control the discharge motor to rotate in the direction of discharge and door open, and stop the DISC Gate Open signal (O23) after the valid input signal (I26) of the discharge door is detected. At this point, the discharge door is open.

Note: If the discharge door open process time exceeds the set discharge door timeout, the controller has not detected the DISC Gate Opened signal (I26), then the controller will stop the output (O23) and alarm.

● Discharge and close process: after the discharge is completed, the DISC Gate Close signal (O24) is output, and the discharge motor is controlled to rotate in the direction of discharge and closing until the DISC Gate Closed signal (I27) is detected to be in place and the DISC Gate Close signal (O24) is stopped after the valid input. At this point, the discharge door is in the closed state.

Note: if the closing time of the discharge door exceeds the set timeout time of the discharge door, and the controller has not detected the signal of the DISC Gate Closed (I27), then the controller will stop the output (O24) and alarm.

3. "Discharge control mode" is set to control discharge by one-way rotation of ordinary motor with single limit: the I/O Module involved are DISC Gate Open (O23), DISC Gate Closed (I27).

Take discharge process as an example:

● Discharge and door open process: at the beginning of the discharge process, the DISC Gate Open signal (O23) of the controller controls the discharge motor to rotate in the direction of discharge and door opening, and continuously sets the output time of the discharge motor's door signal, and then closes the DISC Gate Open signal (O23) output.

● Discharge and close process: after the discharge is completed, the DISC Gate Open signal (O23) is output, and the discharge motor controlled to continue to rotate in the direction of discharge and close until the discharge door is detected DISC Gate Closed (I27) and the DISC Gate Open signal (O23) is stopped after the input is valid. At this point, the discharge door is closed.

Note: if the closing time of the discharge door exceeds the set timeout time of the discharge door, and the controller has not detected the signal of the discharge door DISC Gate Closed (I27), then the controller will stop the output (O23) and alarm.

4.4 calibration

Calibration scale is controller calibration. The controller should be calibrated when the M04-5 bulk accumulation controller or any part of the weighing system is changed for the first time and the current equipment calibration parameters cannot meet the user's requirements.The scale parameters directly affect the weighing result of the controller. In order to prevent the wrong operation of personnel, Technician and Administrator are required to log in before the controller can be calibrated (choose the identity of the user to log in).

The national standard requires the input password to protect the scale parameters of the weighing instrument, so the correct password should be entered when entering the scale parameters (initial password: 000000).The scale password is set and changed in the "password management" item of [system information].

Under the calibrate interface (under the menu or the default shortcut number key 2) :

◆ Use [◄] key and [►] key to switch the scale parameters (weighing parameters, empty scale calibration, weight calibration scale).

◆ Use [▲] key and [▼] key to switch the corresponding subitem under the parameter item.

◆ Press [Enter] to pop up the dialog box of parameter information under the current subitem, and set and modify the parameters of the subitem.

◆ Press [Esc] to exit the scale interface.

Calibration parameter	Items	instructions
Weight para	**1.** Unit	Initial value: kg;G /kg/t/lb four options.
	2. Decimal point	Initial value: 0.00;There are 5 options from 0~0.0000.
	3. Loadcell sensitivity	Fixed 3 mv/V

	4. Resolution	Initial value: 1;1/2/5/10/20/50 six options	
	5. Capacity	Initial value: 100.00;≤ minimum indexing ×100000 can be set	
Calibrate Zero	Weight	Displays the current weight value of the scale	In this interface, clear the weighing platform（weighing bucket）and press［Enter］to calibrate the current state to zero.
	Loadcell Input	Displays the current sensor output voltage	
calibrate Weight	Weight	Displays the current weight value	In this interface, load the weight to the weighing platform（weighing hopper）, press［Enter］to pop up the dialog box, Enter the weight value, and complete the calibration of the weight value of the controller.
	Relative Gain voltage	Displays the output voltage of the loading weight	
Theoretical calibration	Weight	Displays the current weight value	In this interface, ″1. Zero calibration without weights″ is displayed. Press［Enter］to pop up the dialog box, input zero voltage value, and press［Enter］to perform zero calibration without weights.
	Loadcell Input	Displays the output voltage of the loading weight	Press [⌣] shows "2. No relative gain voltage calibration weights" press [M] the pop-up dialog box, Enter relative voltage value, press "Enter" key to relative voltage meter staging first;
			Press [⌣] show "3. No weight gain weight calibration" press [M] the pop-up dialog box, Enter gain weight, press "Enter" key to complete weight value calibration weight value.The gain millivolts must be written before this value is written,

4.5 ACUM D/R Mode

In the cumulative view interface (under the menu or the default shortcut number key 6 to enter) :

Users can check the total accumulation, total accumulation of the system, formula accumulation, user accumulation, total accumulation of the receipt and delivery, receipt and delivery mode under the parameter of "ACUM and Batch", and carry out zero clearing, printing and other operations for the accumulation.Delete the cumulative need to enter a password.

◆ Use [◀] key and [▶] key to switch to view the total accumulation, 1-10, 11-20 formula information, user accumulation, receipt and delivery mode.

◆ Select the formula number or user number to be printed with [▲] and [▼] keys.

◆ In the total accumulation interface, use [Zero1] key to delete the total accumulation (including all formula accumulation, all user accumulation, receipt and delivery accumulation).

◆ Press [0] key eight times in the total accumulation interface to enter the password 880406 to delete the total accumulation of the system.

◆ In the formula accumulation interface, use [Zero1] to delete the formula accumulation selected by the cursor.

◆ In the formula accumulation interface, use the [Zero 2] key to delete all formula accumulation.

◆ In the user accumulation interface, use [Zero 1] to delete the user accumulation selected by the cursor.

◆ In the user accumulation interface, use [Zero 2] key to delete the accumulated content under all users.

◆ If the serial communication mode is set as "print", press [M] on the total accumulation interface to print the total accumulation;Press [M] on the formula accumulation interface to print the formula accumulation selected by the cursor, press [Enter] to print the formula accumulation;Press [M] in the user accumulation interface to print the user accumulation selected by the cursor, press [Enter] to print the user accumulation of all users;

◆ If no serial port is set to print, press the above button in this interface to prompt "no serial port is set to print, unable to print".

◆ Press [Enter] in the interface of "mode of ACUM and batch" to set the mode of "receiving or dispatching". If set to the mode of ACUM and batch, the total quantity of delivery cannot be set, that is, the quantity of goods can be received as much as there is, and the machine will not stop until the external stop signal is given.If mode is set to the delivery, need to set up the total shipments, the total set of total shipments, instrument in the main interface prompt ″delivery″ alarm and stop, wait for the user to deal with, can press ″Esc″ key at this time or make ″alarm″ input signals effectively, the controller will clear the alarm and return to stop state, or input stop back and stop state.

Note: set the total amount of goods delivered and the completed goods received and delivered.

4.6 I/O Module

M04-5 provides 8 input and 12 output interfaces to connect the controller with external equipment.

The factory definition of input and output is as follows (output 1-12 corresponds to the interface of instrument out1-out12, and input 1-8 corresponds to the interface of controller in1-8). The default definition is as follows:

output		input	
Output- 1	Run	Input- 1	Start
Output -2	Stopped	Input - 2	Emergency stop
Output - 3	Clogged(Out)	Input - 3	Zero
Output - 4	Coarse Feeding	Input - 4	Clear Alarm
Output - 5	Fine Feeding	Input - 5	Stop
Output - 6	Result Holding	Input - 6	Fill-Go
Output - 7	Over/Under Alarm	Input - 7	Clogged(In)
Output - 8	Alarm	Input - 8	Manual Fi-Feed
Output - 9	Delivery Done	The contents of the outlet and input port can be defined according to the actual application	
Output - 10	Last Feed		
Output - 11	Discharge		
Output - 12	Near Zero		

4.6.1 Definition of output and input port

Under the I/O Module interface (under the menu or the shortcut default number key 8 to enter) :

◆ Switch the output, input and IO test interface with [◀] and [▶] keys.

◆ 【▲】 key and 【▼】 key switch the corresponding input and output under the selection parameters.

◆ Press [Enter] to bring up the dialog box of definable content under the current sub-item.

◆ Use [◀] and [▶] keys to turn the page to find the page where the definition is located (3 pages in total).

◆ Use the [▲] key and the [tio] key to choose what you want to define.

◆ Press [Enter] to exit the definition dialog.

◆ Press [Esc] to exit the switch value interface.

I/O Module description

Output		
code	content	instructions
O0	NONE	Undefined if output port is O0.
O1	Run	This signal is valid when the controller is in operation.

O2	Stopper	This signal is valid when the controller is in the stop state.
O3	Coarse feeding	Large outlet for controlling feeding mechanism. This signal is valid when the current weight is less than the target value - the advance quantity is fast during the feeding process.
M1:	Fine feeding	Small outlet for controlling feeding mechanism. This signal is valid when the current weight is less than the target-drop value during the feeding process.
O5	Result Holding	Used to indicate the end of the feeding process. This signal is valid until the end of slow loading.
O6	Over/Under Alarm	The signal is valid when the quantitative result is out of tolerance or under tolerance.
O7	Alarm	When the instrument gives an alarm, the output is valid (such as alarm of over and under error, unsuccessful zeroing, completion of delivery, alarm of timeout of opening and closing, alarm of invalid signal of opening and closing in place...)..
O8	Delivery Done	The output is valid when the controller alarm delivered.
O9	Last Feed	When the signal is valid, the current is the last feed.
O10	Discharge	Discharge door for controlling controller hopper.
O11	Near Zero	This signal is valid when the current weight is less than or equal to the set value of zero.
O12	FILL Supplement	It is used to control the feeding mechanism of the front end of the packaging scale. When the hopper is controlled by 3 material level, the input of the middle material level is invalid, the output is valid. When the feeding level of the hopper is valid, the controller makes the output invalid.When the hopper is controlled by 2 material level, the output is valid when the input of the cutting level is invalid. When the feeding level of the hopper is valid, the controller makes the output invalid.
O13	Supplement EMPT	The output is valid when the middle or cutting level input selected and the input is invalid.
O14	Clogged(Out)	The Clogged (IN) is valid when the Clogged (IN) is defined and the Clogged (Out) (I7) is valid.
O15	Remote Ctr Output1	The output state of the I/O Module can be controlled by serial port communication protocol Modbus.
O16	Remote Ctr Output2	The output state of the I/O Module can be controlled by serial port communication protocol Modbus.
O17	Remote Ctr Output3	The output state of the I/O Module can be controlled by serial port communication protocol Modbus.
O18	Remote Ctr Output4	The output state of the I/O Module can be controlled by serial port communication protocol Modbus.
O19	Remote Ctr Output5	The output state of the I/O Module can be controlled by serial port communication protocol Modbus.
O20	Cut Material	The output is valid during feeding and invalid during non–feeding.
O21	FeedGate Open(Motor)	Control the motor to open the feeding door.

O22	FeedGate Close(Motor)	Control motor to close feeding door.
O23	DISC Gate Open (Motor)	Control motor to open discharge door.
O24	DISC Gate Close (Motor)	Control the motor to close the discharge door.
Input		
I0	NONE	Indicates that this input port is undefined.
I1	Start	The controller with valid signal will enter into operation state. This input is the pulse input signal.
I2	Emergency Stop	The signal effective controller will return to the stop state. This input is the pulse input signal.
I3	Stop	During operation, after the signal is effective, the controller will stop feeding and directly enter the state of fixed value. After discharge, it will alarm "receiving/delivering completed".
I4	Zero	The effective signal controller will reset the current weight.This input is the pulse input signal.
I5	Clear Alarm	Used to clear the alarm output of the controller. This input is the pulse input signal.
I6	Fill-Go	Level signal. If the signal input is defined, the controller will enter the feeding state only when the signal is judged to be valid before the output feeding. Otherwise, the controller will wait for the signal to be valid before the feeding state.The signal is not judged during feeding.If the signal is not defined, the gauge is not judged before feeding.
I7	Clogged(In)	The signal effectively represents the blockage of the unloading mechanism of the rear equipment, and the controller will not output the discharge signal after setting the value. The controller will not output the discharge signal until the signal becomes invalid, and the signal will not be judged during the discharge process.
I8	Change Recipe	This input is valid once and the formula number is changed to the next formula whose target value is not zero, skipping the formula number whose target value is zero.When the formula number is greater than 20, it returns 1.After selecting the formula, restart the formula number to save.
I9	Print Total ACUM	In the stopped state, the input effective controller can carry out the total accumulation of printing (the communication mode should be set as "printing").
I10	Supplement Full	The feeder used to connect the hopper shall be a level input.
I11	Supplement OK	The input shall be a level input, which is used to connect the leveler of the hopper.
I12	Supplement Empty	This input shall be level input. When it is valid, it is considered to have material; when it is invalid, it is considered to have no material.

I13	Clear Total ACUM	After the input is valid, the controller clears all accumulated data values, including formula accumulated value, user accumulated value, and receipt and delivery accumulated value. Respond to the signal only in the stop state.
I14	Clear In&Out ACUM	When the signal changes from invalid to valid in the stop state, the controller will clear the accumulated weight data of receiving and delivering goods.
I15	Clear Precent Recipe ACUM	After the input is valid, the accumulative data value under the current formula of the controller. Respond to the signal only in the stop state.
I16	Clear Precent User ACUM	After the input is valid, the accumulated data value of the current user of the controller is obtained. Respond to the signal only in the stop state.
I17	Start/Es-top(ON/OFF)	Instrument execution starts when the signal is valid, and stops when the signal is invalid.
I18	Start/Stop(ON/OFF)	When the signal is valid, the controller starts; when the signal is invalid, the controller stops slowly, stops feeding, and directly enters the state of fixed value. After discharge, the alarm is raised to "complete receiving/delivering".
I19	Manual DISC	Used for manual cleaning of material in measuring bucket. The input is valid for one discharge and the output is valid for another discharge. Note: this input only responds when stopped.
I20	Manual DISC(Level Signal)	The signal is effective, discharge output is effective; The signal is invalid and the discharge output is invalid. Note: this input only responds when stopped.
I21	Manual Fine Feed	The input and output of the primary controller are effective;If it is valid again, the output of controller is invalid.
I22	Manual Fi-Feed (Level Signal)	When the signal is valid, the output of the controller is valid, and when the signal is invalid, the output of the controller is invalid. Respond to the signal only in the stop state.
I23	Manual Co-Feed	When set to combined feeding mode: the input is valid for one time fast and one time slow, and the output is valid for another time fast and one time slow. When set to separate feeding mode: this input is valid for one coarse add output, and valid for another coarse add output is invalid. Note: this input only responds when stopped.
I24	Manual Co-Feed (Level Signal)	When the signal is valid, the output of coarse and fine addition of the controller is valid; when the signal is invalid, the output of coarse and fine addition of the controller is invalid.Respond to the signal only in the stop state.
I25	FeedingGate Closed	Electric feeding mode is effective, connect the feeding door to close the signal input in place

I26	Discharge Gate Opened	Connect discharge door to open position signal input
I27	Discharge Gate Closed	If the signal of discharge door closing in place is invalid during feeding, then the output of feeding signal will be closed (manual discharge in stop state does not judge that discharge door closing in place).

4.6.2 I/O Test

The user can check whether the controller output, input interface and external device are connected normally through IO test.**I/O test interface is shown as follows:**

The upper part of the figure is the output test interface, and the lower part is the input test interface.

Outlet test: in the IO test interface, press the number key to start the output test. That is, after pressing the number key, the color of the interface port will light up. The corresponding external connection output state should be valid.

Input port test: in the IO test interface, when the external input signal is valid, the color of the corresponding input definition port under the interface lights up to green.If the external input is valid and the interface does not respond, it indicates that the connection is abnormal.

4.7 COM Para

M04-5 can provide two serial communication interfaces. See section 2.5 for the definition of serial port outlet. Set the connection parameters correctly before communication.

In the serial port parameter interface (under the menu or the default shortcut number key 7) :

◆ Switch serial port (serial port 1, serial port 2, print parameters, etc.) with [◀] key

and [▶] key.

◆ Use [▲] key and [▼] key to switch the corresponding subitem under the parameter item.

◆ Press [Enter] to pop up the dialog box of parameter information under the current subitem, and set and modify the parameters of the subitem.

◆ Press [Esc] to exit the serial port parameter interface.

Serial port parameters	Serial parameter subitem	instructions
COM-RS485 &COM-RS232/RS485	1. COM ID	Initial value：1；**Optional 1 ~ 99.**
	2. Protocol	Initial value: Modbus-RTU。Modbus-RTU/Print/Self-Send Mode/Response 1/ Response 2/ Response 3 optional.
	3.Baudrate	Initial value: 38400; 9600/19200/38400/57600/115200 is optional.
	4. Data Format	Initial value: 8-E-1 (8-bit data bit-parity -1-bit stop bit);8-N-1/8-E-1/7-N-1/7-E-1 optional (modbus-rtu only supports 8-bit data bits).
	5.MODBUS Dword Format	MODBUS communication display: initial value: ab-cd;High words before (ab-cd)/low words before (cd-ab) are optional.
Print Setting	1. Auto Print	On/Off optional; When "On" is selected, the packaging result will be automatically printed out each time the packaging is completed (the serial port should be selected as "print". Initial value: off.
	2. Printer Format	Initial value: print 32 columns； 24 column print /32 column print optional.
	3.Printing Language	Initial value: Chinese; Chinese /English is optional.
	4.Printing Line Nos.	Number of paper lines after printing, initial value: 3;Optional 0 ~ 9.
Ethernet Interface	1.Communiation Mode	**Modbus-TCP/IP**
	2. Server Port	Intital:502; Range:1-65535
	3.IP-address	Intital：192.168.101.246
	4. Mac-address	BC 66 41 9* ** **,只允许修改后三位
	5. Modbus Dword Format	AB-CD/ CD-AB

4.7.1 Self-Sending Mode

A serial port 1:

The first serial port fixed as RS485 can be used to connect serial printer or host computer,

A serial port 2:

The second serial port of the controller is optional rs-232 or rs-485, which can be determined by the position of two switches on the serial port board.

When the communication parameter serial port 1 or serial port 2 is selected as continuous mode, the upper computer automatically receives the current status information of the controller.

STX	ID	C	s.	State 1	State 2	State 3	+/-	Weight	CRC	CR	LF
02 h	Note 1	43 h	53 h	Note 2	Note 2	Note 2	Note 2	Note 2	Note 1	0 dh	0 ah

Note 1:

ID –2 bytes. COM ID；If the scale number is 01, that is: 30H 31H

CRC -- a checksum, in which all the previous values are added and converted to decimal, then the last two bytes are taken and converted to ASCII. (in which the tens place is first and the ones place is last), and   2

Note 2:

Status 1 -- 30H: stop or not working, 31H: before loading, 32H: fast loading, 33H: slow loading, 34H: fixed value (end of loading), 35H: unloading, 36H: receipt and delivery completed.

State 2 -- M: unstable 4DH, S: stable 53H, O: overflow 4FH

State 3 -- G gross weight 47H, N: net weight 4EH

+/- -- symbol, + : 2BH, - : 2DH

Weight — 7 bytes with decimal point   Display value

4.7.2 Response Mode 1

Negative response：refers to the command that failed to execute，and the negative response will be returned as follows：

◆ error command（CE），STX address CE CRC CR LF，if the issued command is not in the list or checksum error.

◆ error data（DE），STX address DE CRC CR LF，if the command is sent with more data than allowed.

◆ if the condition is not met（IE），STX address IE CRC CR LF，the issued execution command cannot be executed under the current condition，such as the operation command under the running state. Send reset command in unstable situation, etc.

Data format:

Command:

STX	ID	Function code	Action object	data	**CRC**	**CR**	**LF**

Among them:

STX - 1.   Start, 02H

ID-- 2 bytes.   If the COM ID is 01, that is: 30H 31H

Function code -- 1 bit. R/W/C/D (52H/57H/43H/ 44H), respectively represents reading, writing and marking

Decide and execute.

Manipulate objects - 3 bits. Depending on the command, see the command list.

Data - varies by command, as shown in the command list.

CRC - 2. Checksum, that is, all the hexadecimal values before the checksum bit are added and converted to decimal, then the last two bits are taken and converted to ASCII.(in which the tens place is first and the ones place is last).

CR -- 1 bit, enter 0DH.

LF -- 1 bit, line break 0AH.

The controller is set to command mode 1.

Function code	Action object	data	meaning	note
R	**T SP SP**	/	Read cumulative	The return protocol format of this command is | STX	ID.	R	T	ACUM Pcs	,	ACUM	CRC	CR	LF | as follows: Among them: **,--2C H.** ACUM Pcs -- 4 bytes, 0000~9999 ACUM -- 10 bytes including the decimal point Note: read the low position when the actual accumulation in the controller system is greater than the readable range.Cumulative times read low 4, cumulative value read low 9.
R	**T**	/	Read the cumulative (compatible with old version)	The return protocol format of this command is | STX	ID.	R	T	ACUM Pcs	,	ACUM	CRC	CR	LF | as follows: Among them: **,- 2C H.** ACUM Pcs -- 4 bytes, 0000~9999 ACUM -- 9 bytes, including 8 bytes of data and 1 decimal point (the high point is space when there is no decimal point) **Note: r**ead the low position when the actual accumulation in the controller system is greater than the readable range.The cumulative times read lower by 4 bits, and the cumulative value read lower by 8 bits.

R	T S U	/	Readable the collection and delivery accumulation	The return protocol format of this command is

STX	ID.	R	U	In&Out ACUM Pcs	,	In&Out ACUM	CRC	CR	LF

as follows:

Among them:

,- 2C H

ACUM Pcs -- 4 bytes, 0000~9999

Cumulative value of receipt and delivery -- 10 bytes, including 9 bytes of data and 1 decimal point (the high point is blank when there is no decimal point)

Note: read the low position when the actual accumulation in the controller system is greater than the readable range. Cumulative times read low 4, cumulative value read low 9.

R	s.	/	Controller state (compatible with old version)	The return protocol format of this command is as follows:

STX	ID.	R	S	State 1	State 2	State 3	+/-	Weight	CRC	CR	LF

Among them:

State 1 -- 30H: stop or not working, 31H: before loading, 32H: fast loading, 33H: slow loading, 34H: fixed value (end of loading), 35H: discharge, 36H: receipt and delivery completed.

State 2 -- M: unstable 4DH, S: stable 53H, O: overflow 4FH

State 3: -- G gross weight 47H, N: net weight 4EH

+/- -- symbol, + : 2BH, - : 2DH

Weight -- 7 bytes, with decimal point, high 0 for space.

R	S SP SP	/	Controller state	

Examples of commands, such as read accumulation:

STX	ID	R	T	SP	SP	CRC	CR	LF

Among them:

STX -- start, (02H)

ID – COM ID 2 bytes. If the scale number is 01, that is: 30H 31H

R - (52 H)

T - (54 H)

SP -- (20H), space

For example: data format of the command to read the result of dosing to meter scale 1:

02 30 31 52 54 20 20 32 39 0D 0A

Means to read the cumulative results.

The controller response

Received correctly:

STX	ID	R	T	DDDD	.	DDDDDDDDD	CRC	CR	LF

Among them:

DDDD -- 4 bits, cumulative times

,- 2 ch

DDDDDDDD -- 10 bytes, cumulative value (9 data bytes +1 decimal point, leave the high value blank when there is no decimal point)

For example, the data format of the result of dosing returned by the controller:

02 30 31 52 54 20 20 20 20 20 20 20 20 20 20 20 30 35 37 0D 0A

Represents the current cumulative times: 0;Cumulative weight：0

N o t e： read the low position when the actual accumulation in the controller system is greater than the readable range. Cumulative times read low 4, cumulative value read low 9.

If the controller receives an error, the corresponding negative response of 4.7.2 is returned.

4.7.3 command mode 2

Send format refer to command mode 1

The controller is set to command mode 2 acceptable command table:

Func-tion code	Action object	data	meaning	note
R	**T SP SP**	NA	Reading accumula-tion (old edition)	The return protocol format of this command is STX | ID. | R | T | ACUM Pcs | . | ACUM | Unit | CRC | CR | LF as follows: Among them: **,- 2 CH.** ACUM Pcs-- 4 bytes, 0000~9999 ACUM-- 10 bytes including the decimal point Unit -- g,kg,t,lb take two bytes **Note:** read the low position when the actual accumulation in the controller system is greater than the readable range.Cumulative times read low 4, cumulative value read low 9.
R	**T**	NA	Read the cumula-tive (old)	The return protocol format of this command is STX | ID. | R | T | Total Acum | CRC | CR | LF as follows: Among them: **,- 2CH**. Total Acum -- 10 bytes, including 9 bytes of data and 1 decimal point (the highest point is a space when there is no decimal point) **Note:** read the low position when the actual accumulation in the controller system is greater than the readable range.Cumulative times read low 4, cumulative

Function code	Action object	data	meaning	note
				value read low 9.
R	C	NA	Read, receive and deliver accumulations (old edition)	The return protocol format of this command is | STX	ID.	R	C	In&Out ACUM Pcs	.	In&Out ACUM	CRC	CR	LF | as follows: Among them: **,- 2 ch.** In&Out ACUM Pcs-- 4 bytes, 0000~9999 In&Out ACUM-- 10 bytes, including 9 bytes of data and 1 decimal point (the high point is blank when there is no decimal point) **Note:** read the low position when the actual accumulation in the controller system is greater than the readable range.Cumulative times read low 4, cumulative value read low 9.
R	T S U	NA	Read, receive and deliver accumulations (old edition)	The return protocol format of this command is | STX	ID.	R	U	In&Out ACUM Pcs	.	In&Out ACUM	CRC	CR	LF | as follows: Among them: **,- 2 ch.** In&Out ACUM Pcs -- 4 bytes, 0000~9999 In&Out ACUM -- 9 bytes, including 8 bytes of data and 1 decimal point (the high point is blank when there is no decimal point) **Note:** read the low position when the actual accumulation in the controller system is greater than the readable range.The cumulative times read lower by 4 bits, and the cumulative value read lower by 8 bits.

4.7.4 command mode 3

Send format refer to command mode 1

The controller is set to command mode 3 acceptable command table:

Function code	Action object	data	meaning	note
R	T SP SP	NA	Read the cumulative	The return protocol format of this command is | STX	ID.	R	T	ACUM Pcs	.	ACUM	CRC	CR	LF | as follows: Among them: **,- 2 ch.** ACUM Pcs-- 4 bytes, 0000~9999 ACUM-- 9 bytes including the decimal point **Note:** read the low position when the actual accumulation in the controller system is greater than the

				readable range.The cumulative times read lower by 4 bits, and the cumulative value read lower by 8 bits.

4.7.5 Printing function

The two serial communication interfaces of the controller can connect to the serial printer (RS232/RS485). If the communication mode of the serial port of the communication parameters is set to print, the corresponding serial port will have the printing function.

By setting the printing format to be wide (32 columns) and narrow (24 columns), by setting the printing language to be Chinese or English.

Description: press the M key to print the total accumulation, the total receipt and delivery, and the flow at the total accumulation interface of the batch and the total accumulation.

In the formula accumulation interface, press M to print the formula accumulation selected by the current cursor, and press Enter to print the formula accumulation of all.

In the user accumulation interface, press M to print the user accumulation selected by the current cursor, and press Enter to print the user accumulation of all users.

If the communication mode is not set to "print", it will prompt "no serial port is set to print" when external input is printed.

4.7.5.1 Automatic printing of content

Set the serial port communication mode of the communication parameters as print, and the automatic print switch of the printing parameters as "on".The following contents will be printed out automatically after each weighing.

The printing format of column 24 is as follows：	The printing format of Chinese 32 columns is as follows：
Packing list	Packing list
Unit：kg	Unit：kg
Formula ＃ 3	Formula no. ：3
Cumulative times：results	Cumulative times target value results
＿＿＿＿＿＿＿＿＿＿＿＿＿＿	＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
1，30.1	1，30.0，30.5
2，30.1	2，30.0，30.4
3 30.2	3 30.0 29.7
4 30.0	＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
＿＿＿＿＿＿＿＿＿＿＿＿＿＿	Receipt/delivery completed
Receipt/delivery completed	This time the cumulative value：90.6kg
The cumulative value：120.4kg	＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿
＿＿＿＿＿＿＿＿＿＿＿＿＿＿	

4.7.5.2 Total cumulative printing

Press 6 under the main interface, press M to print the total accumulation in the total

accumulation interface of accumulation and delivery.

The printing format of column 24 is as follows:	The printing format of Chinese 32 columns is as follows:
Total cumulative statement	Total cumulative statement
Mode: delivery	Mode: delivery
Total shipment: 9999.9kg	Total shipment: 9999.9kg
Time: 2018/09/07 10:19	Time: 2018/09/07 10:05
_____	_____
Flow rate: 1.44t/h	Flow rate: 5.03t/h
Total receipt/delivery: 113.7kg	Total receipt/delivery: 94.6kg
Total accumulation: 599.7kg	Total accumulation: 293.1kg
_____	_____

4.7.5.3 Recipe ACUM Printing

Press 6 under the main interface, press [▶] to switch to the formula accumulation interface, press [▼] and [▲] to switch and select the formula number, press M to print the formula accumulation selected by the current cursor, and press Enter to print the formula accumulation.When printing the cumulative number of all formulas, do not print the formula whose cumulative number is 0.

The printing format of column 24 is as follows:	The printing format of Chinese 32 columns is as follows:
Formula accumulation report	Formula accumulation report
Time: 2018/09/07 10:19	Time: 2018/09/07 10:05
Unit: kg	Unit: kg
_____	_____
Formula no. : 3	Formula no. : 3
18 times:	Number: 8
Weight: 503.7	Weight: 197.1
_____	_____

4.7.5.4 User ACUM Printing

Press 6 under the main interface, press [▶] to switch to the user accumulation interface, press [▼] and [▲] to switch and select the user number, press M to print the user accumulation selected by the current cursor, and press Enter to print the user accumulation of all users.Do not print cumulative times of 0 users.

The printing format of column 24 is as follows:	The printing format of Chinese 32 columns is as follows:
User accumulation report	User accumulation report
Time: 2018/09/07 10:19	Time: 2018/09/07 10:36

Unit：kg	Unit：kg
————————————	————————————————
User：1.	User no. ：1
Result：10	Result：16
Weight：306. 6	Weight：451. 2
————————————	————————————————

4.7.6 Modbus RTU protocol

Modbus-rtu is the communication mode selected at serial port 1 or serial port 2.

4.7.6.1 Function code and exception code

◆ Function code supported by controller:

Function code	Item	Instructions
03	Read address	Read up to 125 addresses a time
06	Write address	
16	Write multiple addresses	This command only supports write double addressesress must be aligned when write, not only write part of the double address only part
01	Read the coil	Note that this length is in bits
05	Write the coil	

Note：this controller only supports the above MODBUS function codes. The controller will not respond to any other function codes.

◆ MODBUS exception code response

code	Item	Instructions
02	Illegal data address	For this meter, the error code represents the data address received is not allow to address.
03	Illegal data value	The part of the data that is written and the scope that is allowed.
04	From the machine fault	An unrecoverable error occurs when the meter is attempting to perform the requested operation.
07	Unsuccessful programming request	For the meter, the received command cannot be executed under the current conditions.

4.7.6.2 MODBUS transmission mode

The MODBUS transmission mode is RTU mode.

When communicating in RTU mode, each 8-bit byte in the information is divided into two 4-bit hexadecimal character transmissions.

Data format：8-bit data bit，1-bit stop bit，even check（8-e-1）

8-bit data bit, 1-bit stop bit, no check (8-n-1)

Wave rate：9600/19200/115200/38400/57600（choose one）

Code：the RTU

4.7.6.3 MODBUS address assignment

Protocol address	The PLC address	meaning	instructions	
The following is read-only				
0	40001	Weight status	.bit	instructions
			.0	0: unstable;1: stable.
			.1	0: : non-zero 1: zero
			.2	The symbol that currently displays the weight. Zero: plus sign; 1: the minus sign.
			.3	Positive weight overflow
			.4	Negative weight overflow
			.5	Millivolt positive overflow
			.6	Millivolt negative overflow
			.7	0: millivolt is unstable;1. Stable millivolts
			.8~.15	Reserved
1	40002	Running state	.bit	instructions
			.0	Zero: stop;1: run.
			.1	Before loading
			.2	Coarse Feeding
			.3	Fine Feeding
			.4	Result Holding
			.5	OVER/UNDER detection
			.6	Discharge
			.7	Near Zero
			.8	FILL Supplement
			.9	Supplement EMPT
			.10	Receipt/ Delivery Done
			.11	Last Feed
			.12	OVER
			.13	UNDER
			.14	Stop
			.15	Reserved
2	40003	condition	.bit	instructions
			.0	Supplement Full
			.1	Supplement OK
			.2	Supplement Empty
			.3	Discharge Gate Closed
			.4	Fill-Go

			.5	Cutting material: feeding signal
			.6	Clogged(Out)
			.7~.15	Reserved
3	40004	Alarm message 1	.bit	instructions
			.0	Dispatch alarm
			.1	Zeroing over range
			.2	Zeroing is unstable
			.3	Manual zeroing is not allowed in running
			.4	Target value set to 0, unable to start
			.5	Alarm for over under performance
			.6	Weight overflowed, unable to start
			.7	The continuous times of insufficient flow have reached the set value
			.8	Judge the timeout to be stable but the scale body is not yet stable
			.9	Unreasonable setting of target traffic（target traffic function is turned on, and target traffic is started with 0 input）
			.10	There is no manual clearance of collection and shipment accumulation at startup
			.11	The discharge door is not closed in place
			.12	The feeding door is not closed in place
			.13	The feed gate closes over time
			.14	The discharge door is out of time
			.15	The discharge door closes over time
4	40005	Alarm message 2	.bit	instructions
			.0	The parameter setting of feeding motor is not reasonable
			.1	The calibration of empty scale fails, and the weighing bucket is unstable
			.2	The calibration of the blank scale fails, and the weighing bucket is overweight（zero voltage input of no weight is greater than 15625）.
			.3	The calibration of the blank scale fails, and the weighing bucket is too light（zero point voltage input without weight is less than 2）.
			.4	The weight calibration scale failed and the weighing bucket was unstable

			.5	The weight calibration scale fails, the weighing bucket is overweight (no weight gain voltage input greater than 15625)
			.6	Weight calibration scale fails, weighing bucket is too light (input weight when relative voltage is negative)
			.7	Weight calibration failed, weight input error (no weight gain written to 0 or written to a value greater than the maximum range)
			.8	The weight calibration scale fails, the input weight value is too large (the calibration resolution is too high)
			.9	The weight calibration scale failed, and the relative gain voltage value was not calibrated (the relative gain voltage value was not calibrated when the weight was calibrated without weights).
			.10	The alarm is suspended for over fault
			.11~.15	Reserved
5	40006	Reserved		
6-7	40007-40008	Current weight (controller display weight)	4 bytes, signed number (display weight).Note: when the weight overflows, that is, the meter shows OFL, the weight value is fixed back to 0xFFFFFFFF.	
8-9	40009--0010	Current flow	Read only: units and decimal points are read at 40010 and 40011 addresses.	
10	40011	Current flow unit	Read only: 0: g/h;1 kg/h.2: t/h;3: lb/h.	
11	40012	Current flow point	Read only: 0:0 bits;1:1 bits;2:2 bits;3:3 bits;Four to four.	
12-13	40013-40014	The version number	Read only, e. g. 010000	
14-15	40015-40016	Compile date	Read only, such as 180709, means July 9, 18	
16-17	40017-40018	Compile time	Read only, such as: 102010, means 10:20 minutes and 10 seconds	
...	...	**Reserved**		
100	40101	Receiving and Delivery mode 0: receiving 1: Delivery		
101-102	40102-40103	Total quantity delivered (0~999999999)		

103-104	40104-40105	Cumulative times of receipt and delivery（read only）		
105-106	40106-40107	Cumulative weight of receipt and delivery（read only）		
107-108	40108-40109	Total cumulative times, 9*9（read only）		
109-110	40110-40111	Total cumulative weight Hi 6（read only）		
111-112	40112-40113	Total cumulative weight low 9（read only）		
113-114	40114-40115	Total cumulative times of the system（read only）		
115-116	40116-40117	Total cumulative weight of the system is Hi 6 bits（read only）		
117-118	40118-40119	The total cumulative weight of the system is low 9 bits（read only）		
. . .	. . .	Reserved		
150	40151	Unit 0: g; 1 kg;2: t;3: lb.		
151	40152	The decimal point is 0:0; 1:1 bits;2:2 bits;3:3 bits; 4:4 bits		
152	40153	Minimum index value 1; 2;5;10;20;50.		
153	40154	Sensor sensitivity 3:3 mV/V（unchangeable）		
154-155	40155-40156	Maximum range $\leqslant$ minimum indexing value $\times 100000$		
156-157	40157-40158	cali-brated with weights	weight zero calibra-tion	When writing 1, take the current weight as zero, and only when the weight of the scale is stable can it be written；Returns absolute millivolts when read.
158-159	40159-40160		weight gain calibra-tion	Write the current actual weight, the controller according to the current millivolt and write weight calibration gain；Read returns the millivolts of the current weight. If the millivolts of the current gain weight are negative, the gain cannot be calibrated.
160-161	40161-40162	Cali-bration with-out weight	Zero cali-bration voltage without weight	Writes the millivolt value to be cali-brated as zero；Read returns the current zero milli-volts.

162-163	40163-40164		No weight gain calibration voltage		Write the millivolts corresponding to the gain weight. Returns relative millivolts when read
164-165	40165-40166		No weight gain calibration weight		Write the weight value corresponding to the gain millivolt. Before writing this value, write the gain millivolt without weight. When writing this register, use the two to calibrate the gain. Returns the written value when read.
. . .	. . .	Reserved			
200	40201	Recipe ID; Range:**1 ~ 20**			
201-202	40202-40203	Target Value			Write value <=maximum range
203-204	40204-40205	Coarse Flow Remains			
205-206	40206-40207	Free Fall			
207-208	40208-40209	Near Zero Band			
209	40210	Pre−start delay			0 ~ 999 (0.0 ~ 99.9 s)
210	40211	COMP Inhibit Timer(Co-F)			0 ~ 999 (0.0 ~ 99.9 s)
211	40212	COMP Inhibit Timer(Fi-F)			0 ~ 999 (0.0 ~ 99.9 s)
212	40213	Value stable Timer			0 ~ 999 (0.0 ~ 99.9 s)
213	40214	Discharge Timer			0 ~ 999 (0.0 ~ 99.9 s)
214	40215	Over/Under Alarm ON/OFF			Zero: OFF; 1: ON.
215	40216	Over/Under Pause ON/OFF			Zero: OFF; 1: ON.
216	40217	Over/Under Alarm Timer			0 ~ 999 (0.0 ~ 99.9 s)
217-218	40218-40219	Over value			The write value <= maximum range
219-220	40220-40221	Under value			
221	40222	Target flow function ON/OFF			0: OFF; 1: ON.
222	40223	Insufficient flow alarm function ON/OFF			0: OFF; 1: ON.
223	40224	Insufficient flow alarm statistics times			0 ~ 99

224		Automatically adjust the function ON/OFF after insufficient flow（discharge interval timeout）	0: OFF;　　1: ON.
	40225		
225-226	40226-40227	Target flow value	0 ~ 999999
227	40228	Power plant,	**0 ~ 4**
. . .	. . .	**Reserved**	
Basic parameters			
300	40301	Flow calculation window length	**1 ~ 6**
301	40302	Feeding method selection	0: comb　1: solo
302	40303	Power-Up Zero ON/OFF	0: OFF;　　1: ON.
303	40304	Manual Discharge ACUM ON/OFF	0: OFF;　　1: ON
304	40305	Result Holding ON/OFF	0: OFF;　　1: ON
305	40306	The ACUM ON/OFF of last receipt and delivery shall be cleared manually when starting	0: OFF;　　1: ON
. . .	. . .	**Reserved**	
Advanced parameters			
350	40351	Stop state, AD Digital Filter	**1 ~ 9**
351	40352	Running state, AD Digital Filter	1 ~ 9
352	40353	**AD sampling rate**	0 ~ 3
353	40354	Advance Filter ON/OFF	0: OFF;　　1: ON.
354	40355	Discharge Filter series	1 ~ 9
355	40356	Waiting Process Filter	1 ~ 9
356	40357	Stable Timer	1-99 (0.1 ~ 9.9 s)
357	40358	Stable Range	0 ~ 99 (d)
358	40359	Zero Track Timer	1-999 (0.1 ~ 99.9 s)
359	40360	Zero Track Range	0 ~ 9 (d)
360	40361	Zero Range	1% ~ 99%
361	40362	Auto Zero Interval	0 ~ 99
362	40363	Running state stable overtime	0 ~ 999 (0.0 ~ 99.9 s)
363	40364	User ID（for foreground use only）	0-9
. . .	. . .	**Reserved**	

		I/O Module	
400	**40401**	Start/end I/O Module test	Write 1 to enter the I/O Module test, write 0 to close the I/O Module test
401	**40402**	Input I/O Module test	
402	**40403**	Output I/O Module test	
403	**40404**	I/O Module custom	**IN1**	Write: write the function value corresponding to the I/O Module. To define IN2 as I3, write 3 in the register corresponding to IN2. Read: returns the current I/O Module custom state.
404	**40405**		**IN2**	
405	**40406**		**IN3**	
406	**40407**		**IN4**	
407	**40408**		**IN5**	
408	**40409**		**IN6**	
409	**40410**		**IN7**	
410	**40411**		**IN8**	
411	**40412**		**The OUT1**	
412	**40413**		**OUT2**	
413	**40414**		**OUT3**	
414	**40415**		**OUT4**	
415	**40416**		**OUT5**	
416	**40417**		**OUT6**	
417	**40418**		**OUT7**	
418	**40419**		**OUT8**	
419	**40420**		**OUT9**	
420	**40421**		**OUT10**	
421	**40422**		**OUT11**	
422	**40423**		**OUT12**	
. . .	. . .	**Reserved**	
Communication parameters			
500	**40501**	**Serial port 1 (read only)**	**ID no.**
501	**40502**		Communication methods
502	**40503**		Baud rate
503	**40504**		The data format
504	**40505**		High low
505	**40506**		**ID**

506	40507	**Serial port 2 (read only)**	Communication methods	
507	40508		Baud rate	
508	40509		The data format	
509	40510		High and low	
. . .	. . .	**Reserved**		
530	40531	Serial port 1 automatic print ON/OFF		Zero: OFF; 1: ON.
531	40532	Serial port 1 print format		0:24 columns;1:32 column
532	40533	Serial port 1 printing language		0: Chinese;1: English
533	40534	Serial port 1 print the number of paper lines		0-9
534	40535	Total cumulative data printing Write 1: total print accumulation		
535	40536	User cumulative printing	Write 0－9: print corresponding 0－9 user accumulations write 101: print the accumulations of all users（users who do not print the accumulations of 0）write 100: print the accumulations of current users	
536	40537	Formula cumulative report printing	Write 1－20: print the corresponding formula accumulation; Write 101: print all formula accumulations（do not print the formula where the accumulative data is 0）; Write 100: print the current formula accumulation	
570-573	40571-40574	IP address **1**~ IP address **4**		
574	50575			
575	40576	Additional board type;0:AB-CD;1:CD-AD		
...	...	**Reserved**		
Motor parameters				
600	40601	Feed Gate Drive Mode 0: Air Drived,1: Motor Drived (single Limit)		
601	40602	Motor Group ID;Range:0 - 4		
602	40603	Running time when the feeding door opens to the coarse feed position. Range:0 ~ 9999 (0.0 ~ 99.99 s)		
603	40604	Running time when the feeding door is closed to the fine flow position;Range:0 ~ 9999 (0.0 ~ 99.99 s)		
604	40605	Feed Gate Close OverTime;Range:0 ~ 999 (0.0 ~ 99.9 s)		
605	40606	Signal Type of Feed Gate Closed		

		0: Feed Gate Closed-Signal ON;1: Feed Gate Closed-Signal OFF
606	**40607**	DISC Gate Drive Mode 0: Air Drived;1: Motor Drived (single Limit);2: Motor Drived (Double Limit);3: Motor Rotation (single Limit)
607	**40608**	DISC Gate Open Timer 0 ~ 9999 (0.0 ~ 99.99 s)
608	**40609**	DISC Gate Close OverTime ;Range:0 ~ 999 (0.0 ~ 99.9 s)
609	**40610**	DISC Gate Open OverTime;Range:0 ~ 999 (0.0 ~ 99.9 s)
610	**40611**	Signal Type of DISC Gate Closed 0: DISC Gate Closed-Signal ON;1: DISC Gate Closed-Signal OFF
611	**40612**	DISC Limit InRun Check ON/OFF;0: off; 1: on.
. . .	. . .	**Reserved**
ACUM Info. Review(READ ONLY)		
700-701	**40701-40702**	User 0 ACUM PCS
702-703	**40703-40704**	User 0 accumulative weight high 6 bits
704-705	**40705-40706**	User 0 accumulative weight low 9 bits
706-707	**40707-40708**	User 1 ACUM PCS
708-709	**40709-40710**	User 1 acumulative weight high 6 bits
710-711	**40711-40712**	User 1 accumulative weight low 9 bits
712-713	**40713-40714**	User 2 ACUM PCS
714-715	**40715-40716**	User 2 acumulative weight high 6 bits
716-717	**40717-40718**	User 2 accumulative weight low 9 bits
718-719	**40719-40720**	User 3 ACUM PCS
720-721	**40721-40722**	User 3 acumulative weight high 6 bits
722-723	**40723-40724**	User 3 accumulative weight low 9 bits
724-725	**40725-40726**	User 4 ACUM PCS
726-727	**40727-40728**	User 4 acumulative weight high 6 bits
728-729	**40729-40730**	User 4 accumulative weight low 9 bits
730-731	**40731-40732**	User 5 ACUM PCS
732-733	**40733-40734**	User 5 accumulative weight high 6 bits
734-735	**40735-40736**	User 5 accumulative weight low 9 bits

736-737	40737-40738	User 6 ACUM PCS
738-739	40739-40740	User 6 acumulative weight high 6 bits
740-741	40741-40742	User 6 accumulative weight low 9 bits
742-743	40743--40744	User 7 ACUM PCS
744-745	40745-40746	User 7 acumulative weight high 6 bits
746-747	40747-40748	User 7 accumulative weight low 9 bits
748-749	40749-40750	User 8 ACUM PCS
750-751	40751-40752	User 8 acumulative weight high 6 bits
752-753	40753-40754	User 8 accumulative weight low 9 bits
754-755	40755-40756	User 9 ACUM PCS
756-757	40757-40758	User 9 acumulative weight high 6 bits
758759	40759--40760	User 9 accumulative weight low 9 bits
760-761	40761-40762	Recipe 1 ACUM PCS
762-763	40763-40764	Recipe 1 accumulates weight high 6 bits
764-765	40765-40766	Recipe 1 accumulative weight low 9 bits
766-767	40767-40768	Recipe 2 ACUM PCS
768-769	40769-40770	Recipe 2 accumulates weight high 6 bits
770-771	40771-40772	Recipe 2 accumulative weight low 9 bits
772-773	40773-40774	Recipe 3 ACUM PCS
774-775	40775-40776	Recipe 3 accumulates weight high 6 bits
776-777	40777-40778	Recipe 3 accumulative weight low 9 bits
778-779	40779-40780	Recipe 4 ACUM PCS
780-781	40781-40782	Recipe 4 acumulative weight high 6 bits
782-783	4078340784	Recipe 4 accumulative weight low 9 bits
784-785	40785-40786	Recipe 5 ACUM PCS
786-787	40787-40788	Recipe 5 accumulative weight high 6 bits
788-789	40789-40790	Recipe 5 accumulative weight low 9 bits
790-791	40791-40792	Recipe 6 ACUM PCS
792-793	40793-40794	Recipe 6 accumulative weight high 6 bits

794-795	40795-40796	Recipe 6 accumulative weight low 9 bits
796-797	40797-40798	Recipe 7 ACUM PCS
798-799	40799-40800	Recipe 7 accumulates weight high 6 bits
800-801	40801-40802	Recipe 7 accumulative weight low 9 bits
802-803	40803-40804	Recipe 8 ACUM PCS
804-805	40805-40806	Recipe 8 accumulates weight high 6 bits
806-807	40807-40808	Recipe 8 accumulative weight low 9 bits
808-809	40809-40810	Recipe 9 ACUM PCS
810-811	40811-40812	Recipe 9 accumulates weight high 6 bits
812-813	40813-40814	Recipe 9 accumulative weight low 9 bits
814-815	40815-40816	Recipe 10 ACUM PCS
816-817	40817-40818	Recipe 10 acumulative weight high 6 bits
818-819	40819-40820	Recipe 10 accumulative weight low 9 bits
820-821	40821-40822	Recipe 11 ACUM PCS
822-823	40823-40824	Recipe 11 accumulates weight high 6 bits
824-825	40825-40826	Recipe 11 accumulative weight low 9 bits
826-827	40827-40828	Recipe 12 ACUM PCS
828-829	40829-40830	Recipe 12 accumulates weight high 6 bits
830-831	40831-40832	Recipe 12 accumulative weight low 9 bits
832-833	40833-40834	Recipe 13 ACUM PCS
834-835	40835-40836	Recipe 13 accumulates weight high 6 bits
836-837	40837-40838	Recipe 13 accumulative weight low 9 bits
838-839	40839-40840	Recipe 14 ACUM PCS
840-841	40841-40842	Recipe 14 accumulates weight high 6 bits
842843	40843--40844	Recipe 14 accumulative weight low 9 bits
844-845	40845-40846	Recipe 15 ACUM PCS
846-847	40847-40848	Recipe 15 accumulates weight high 6 bits
848-849	40849-40850	Recipe 15 accumulative weight low 9 bits
850-851	40851-40852	Recipe 16 ACUM PCS

852-853	40853-40854	Recipe 16 accumulates weight high 6 bits
854-855	40855-40856	Recipe 16 accumulative weight low 9 bits
856-857	40857-40858	Recipe 17 ACUM PCS
858-859	40859-40860	Recipe 17 accumulates weight high 6 bits
860-861	40861-40862	Recipe 17 accumulative weight low 9 bits
862-863	40863-40864	Recipe 18 ACUM PCS
864--865	40865--40866	Recipe 18 accumulates weight high 6 bits
866-867	4086740868	Recipe 18 accumulative weight low 9 bits
868-869	40869-40870	Recipe 19 ACUM PCS
870-871	40871-40872	Recipe 19 accumulates weight high 6 bits
872-873	40873-40874	Recipe 19 accumulative weight low 9 bits
874--875	4087540876	Recipe 20 ACUM PCS
876--877	40877--40878	Recipe 20 accumulates weight high 6 bits
878-879	40879-40880	Recipe 20 accumulative weight low 9 bits
880-881	40881-40882	Recipe 1 target value
882-883	40883-40884	Recipe 2 target value
884-885	40885-40886	Recipe 3 target value
886-887	40887-40888	Recipe 4 target value
888-889	40889-40890	Recipe 5 target value
890-891	40891-40892	Recipe 6 target value
892-893	40893-40894	Recipe 7 target value
894-895	40895-40896	Recipe 8 target value
896-897	40897-40898	Recipe 9 target value
898-899	40899-40900	Recipe 10 target value
900-901	40901-40902	Recipe 11 target value
902-903	40903-40904	Recipe 12 target value
904-905	40905-40906	Recipe 13 target value
906-907	40907-40908	Recipe 14 target value
908-909	40909-40910	Recipe 15 target value

910-911	**40911-40912**	Recipe 16 target value	
912-913	**40913-40914**	Recipe 17 target value	
914-915	**40915-40916**	Recipe 18 target value	
916-917	**40917-40918**	Recipe 19 target value	
918-919	**40919-40920**	Recipe 20 target value	
Special function			
950	**40951**	Parameters of the reset	Write 8800 reset all parameters（including calibration） write 8801 reset all parameters（excluding calibration） write 8802 reset recipe parameters write 8803 reset working parameters write 8804 reset motor parameters write 8805 reset calibration parameters write 8806 reset I/O Module parameters write 8807 reset communication parameters
951	**40952**	parameter backup	Write 8800 Execute parameter backup, write 8801 to perform restore backup, write 8802 to perform delete backup
952-953	**40953-40954**	Backup date;read-only	
954-955	**40955-40956**	Backup time,read-only	
956	**40957**	Clear Total ACUM	Write 0 to clear all accumulated data Write 1 to clear the total cumulative data, read 0
957	**40958**	Clear Recipe ACUM	Write 1-20 to clear the corresponding cumulative data write 100 to clear the current recipe cumulative write 101 to clear all recipe cumulative read 0
958	**40959**	Clear user accumulation	Write 0-9 to clear the user accumulation Write 100 to clear the current user's accumulated data Write 101 to clear all user accumulated data Read to 0
9100-9705	**49101-49106**	MAC	MAC address **1**~MAC address **6;** Initial:BC 66 41 9* ** **, only allow to revise last three digit.
Coil（coil performs I/O Module function）			
0000	**00001**	Start	Read：0 write 1 perform function
0001	**00002**	Emergency stop	
0002	**00003**	stop	

0003	00004	zero	
0004	00005	Clear alarm	
0005	00006	Choose Recipe	
0006	00007	Print Total ACUM	
0007	00008	Clear Total ACUM	
0008	00009	Clear In&Out ACUM	
0009	00010	Clear Precent Recipe ACUM	
0010	00011	Clear Precent User ACUM	
0011	00012	Manual Discharge	
0012	00013	Manual fine Feed	
0013	00014	Manual Coarse Feed	
0014	00015	Remote Ctr Output1	
0015	00016	Remote Ctr Output2	
0016	00017	Remote Ctr Output3	
0017	00018	Remote Ctr Output4	
0018	00019	Remote Ctr Output5	
...	. . .	Reserved	
0050	00051	IO test ON/OFF	Write 1 to enter the test, 0 to exit the test.
0051	00052	IN1	
0052	00053	IN2	
0053	00054	IN3	
0054	00055	IN4	
0055	00056	IN5	read-only
0056	00057	IN6	
0057	00058	IN7	
0058	00059	IN8	
0059	00060	OUT1	
0060	00061	OUT2	
0061	00062	OUT3	
0062	00063	OUT4	
0063	00064	OUT5	(read and write) write 1 is valid, write 0 is invalid
0064	00065	OUT6	
0065	00066	OUT7	
0066	00067	OUT8	
0067	00068	OUT9	
0068	00069	OUT10	

0069	00070	**OUT11**	
0070	00071	**OUT12**	
0071	00072	Full reset（including calibration）	
0072	00073	Full reset（excluding calibration）	
0073	00074	Reset all formula parameters	
0074	00075	working parameter reset	
0075	00076	Motor parameter reset	Read：0 write 1 perform function
0076	00077	Reset of Calibration Parameter	
0077	00078	I/O Module custom reset	
0078	00079	Reset of communication parameters	
0079	00080	Perform parameter backup	
0080	00081	Restore backup parameters	
0081	00082	Delete backup parameters	

4.8 User Management

Technicians and Administrators can use the "user management" item to log in users, edit users, and set up automatic login users.

Under the user management interface

◆ Use [◀] key and [▶] key to switch to view user list, user edit, automatic login information item.

◆ 【▲】 key and 【▼】 key switch select the information item under the corresponding subitem.

◆ Press [Enter] to pop up the dialog box of parameter information under the current subitem, and set and modify the parameters of the subitem.

◆ Press [Esc] to exit the user management interface.

User management	Information items	instructions
User list	User login	Login user: 0-7: Operators, 8: Technician 9: Administrator (supreme authority)
User edit	**1.**User Login	Displays the current logged-in user, which can not be modified.
	2.ID	Write user ID which required edited.
	3.Permission	Technician /Operator
	4.Password ON/OFF	ON/OFF. When set OFF, user can log in without password.
	5. Login Password	To set/modify password, user has to input correct password before operation. The password must be six bits.
Auto-login	Auto-login	0-8: User login automatically 9: Previous user login.

4.9 System Information

Technician and Administrators can use the "system information" item for user management, password management, data recovery and backup, shortcut key definition, view the version of the instrument.

Under the system information interface

◆ Switch between [◀] and [▶] to select user management, password management and other information items.

◆ 【▲】 key and 【▼】 key switch select the information item under the corresponding subitem.

◆ Press [Enter] to pop up the dialog box of parameter information under the current subitem, and set and modify the parameters of the subitem.

◆ Press [Esc] to exit the system information interface.

System information	Items	Description
Review version	/	View the current version , time and date
Password management	**1.**Recipe para password	Option: ON/OFF, user can enter without password if set OFF. To press 【Zero2】 can revise password of according parameter. Initial password: 000000.
	2.Working Para Password	
	3.Motor Para Password	
	4. Calibration password r	
	5.ACUM Info Password	
	6. I/O module password	
	7.COM Para password	
	8.System information password	
Reset&Backup	1. Reset All Para (include CAL)	Press ［Enter］ to restore all parameters of the meter to factory set values.
	2. Reset All Para (exclude CAL)	Press ［Enter］ to restore all parameters of the meter as factory set values, and the scale will not be restored.
	3. Reset Recipe Para	Press ［Enter］ to restore the formula parameter value to the factory setting value.
	4. Reset Working Para	Press ［Enter］ to restore the working parameter value to the factory setting value.

	5. Reset Motor Para	Press〔Enter〕to restore the motor parameter value to the factory setting value.	
	6. Reset Calibration	Press〔Enter〕to restore the scale parameter value to the factory setting value.	
	7. Reset I/O Funtion Define	Press〔Enter〕to restore the value of the switch quantity parameter to the factory setting value.	
	8. Reset COM Para	Press〔Enter〕to restore the communication parameter value is the factory setting value.	
	9. Reset Shortcut Key	Press〔Enter〕to restore the shortcut defined as the factory setting value.	
	10. Parameter Backup	Press〔Enter〕to backup the current parameter Settings.	
	11. Recovey Parameter	Press〔Enter〕to restore the parameter value to the most recent backup value.	
	12. Delete Parameter Backup	Press〔Enter〕to delete the backed up parameters.	
Data Import(USB)	1. All Parameter	Import all parameters from USB	
	2. Recipe Para	Import the recipe parameters from USB	
	3. Working Para	Import working parameters from USB	
	4. Motor Para	Import motor parameters from USB	
	5. Calibration	Import calibration parameters from USB	
	6. I/O Function Define	Import switch volume parameters from USB	
	7. COM Para	Import communication parameters from USB	
	8. Shortcut key	Import shortcut key parameters from USB	
Data export(USB)	1. All Parameter	USB exports all parameters from the meter	
	2. Recipe Para	USB exports the formula parameters from the meter	
	3. Working Para	USB exports working parameters from the meter	
	4. Motor Para	USB exports motor parameters from the meter	
	5. Calibration	USB exports calibration parameters from the meter	
	6. I/O Function Define	USB exports switch quantity parameters from the meter	
	7. COM Para	USB exports serial port parameters from the meter	
	8. Shortcut Key	USB exports shortcut key parameters from the meter	
	9. ACUM Data	USB exports cumulative data from the meter	
Shortcut Config	1. Button [1]	Initial value: working parameters	Press〔Enter〕to optionally define key functions.
	2.Button[2]	Initial value: calibration scale	

	3. Buttons [3]	Initial value：receiving and delivering mode	Use the [◀] and [▶] keys to select the page-turning search (9 pages in total). Use the [▲] key and [tio] key to select the function parameter value in the current page. Note: the shortcut key supports the input definition of custom menu items, formula parameters, working parameters and partial switch quantities.
	4. Button [<-]	Initial value：target value	
	5. Button[4]	Initial value：system information	
	6. Button[5]	Initial value：formula number	
	7. Button[6]	Initial value：accumulation, receipt and delivery	
	8. Button[0]	Initial value：user management	
	9. Button[7]	Initial value：communication parameters	
	10. Button[8]	Initial value：switching volume	
	11. Button[9]	Initial value：formula parameters	
	12. Button[.,?]	Initial value：motor parameters	
Others	**1. Language**	Fixed simplified Chinese	
	2. Optional port	There is no	
	3. Brightness	Adjust screen brightness	
	4. Screen saver time	You can set the time for the screen to go off	

Note: for the defined number keys press the corresponding number key to enter the corresponding parameters in the main interface or shortcut view interface. For example, the number 1 key initially defaults to "working parameters". For the main interface or shortcut view interface, press the number 1 key to enter the "working parameters" interface.If the number 1 key is defined as "run"; press the number 1 key to start the meter.

5. Functional specifications

5.1 real-time flow

Principle of flow calculation:

After each start, first write down the start time t0, start feeding, feeding to end a process.Let the discharge value be DiscVal(1).Before starting the second process, write down the second startup time t1, then you can know that the first time is dT(1) and start the second feeding.

Then the first discharge time and discharge value can be calculated as Flux= K*DiscVal (1)/DT (1).

Where: K is the conversion coefficient (because DiscVal(x) is based on the unit and decimal point demarcated by the system, dT(x) is 0.1s, and the flow is shown in t/h or Kg/h, so conversion is required; the conversion rules will be introduced in the following section).

Similarly, DiscVal(x) and DT(x) for each run (x=1, 2, 3,4,5,6, i.e. the most recent 6 runs) can be stored in a queue.

If FluxLen (flow window length) is 1, only the last run time and discharge value are saved, that is,DiscVal(x) and dT(x) are updated every run.

Flux =K*DiscVal (1)/DT (1)

If FluxLen> is 1, let FluxLen=n, run k times

When k<n, the queue is not full

Flux = K * (DiscVal1 + DiscVal2 +...+ DiscValk)/(dT1 + dT2 +...+ dTk)

When k>n, the newly collected data replaces the oldest data, that is, the most recent n data in the traffic data queue.

Flux = K * (DiscVal1 + DiscVal2 +...+ DiscValn)/(dT1 + dT2 +...+ dTn)

system unit system / The decimal point	t			Kg			G			lb		
4	Flow unit	Flow point	K.	Flow unit	Flow point	K.	Flow unit	Flow point	K.	Flow unit	Flow point	K.
	T/h	**2**	**360**	**Kg/h.**	**2**	**360**	**G/h**	**2**	**360**	**Lb/h.**	**1**	**36**
3	**T/h**	**1**	**360**	**T/h**	**2**	**3.6**	**Kg/h.**	**2**	**3.6**	**Lb/h.**	**0**	**36**
2	**T/h**	**0**	**360**	**T/h**	**2**	**36**	**Kg/h.**	**2**	**36**	**Lb/h.**	**0**	**360**

1	T/h	0	3600	T/h	2	360	Kg/h.	2	360	Lb/h.	0	3600
0	T/h	0	36000	T/h	2	3600	Kg/h.	2	3600	Lb/h.	0	36000

5.2 function description of target flow

When the "target flow" function is turn on, controller will calculate the conversion according to the set "target flow value" and "target value". Calculate the time needed for a feeding process, and then wait for the calculated time before controller start to discharge before starting discharge.If the "target traffic value" is set to 0, the input start will alarm " Target is unreasonable, Unable To Start ".

For example, if the target flow rate is 1000kg/h and the target value is 10kg, then 100 times of feeding should be completed every hour, and the time required for each feeding process is 3600s÷100=36s. Then the meter will control the last start unloading time and this start unloading time interval is 36s.

If you open the "Flowrate Low Alarm ON/OFF" function, the controller will be in the running process automatically judge whether the feeding interval greater than calculated feeding interval. If calculated by continuous more than feeding time to reach "Flowrate Low Alarm Trigger Count ", the controller will output alarm signal, but the feeding process is normal.The alarm will be cleared automatically after 3 seconds, or press [Esc] to clear the alarm.

If "Flowrate Low Auto Adjust ON/OFF " turn on, if the controller detects discharge timeout, then the next few controller will try to shorten the discharge interval within the controllable range, and eventually cancel out the timeout.For example, the discharge interval of the above example is 36s. If the discharging interval is 40s and the timeout is 4s, the controller will be adjusted to shorten the discharge interval of the next scale, and directly adjust to 32s if possible.If 2s can only be shortened to 34s discharge, then the controller will offset the timeout 4s with two 34s discharge intervals.

Note：

1. Discharge times per hour will be calculated in the controller, to calculate the discharge interval time, and the discharge times are integers, so the target flow and target value cannot be too close, otherwise, there will be a big error. For example, if the target flow rate is 300kg/h and the target value is 200kg, then 1.5 discharge times per hour should be performed. However, only integers are stored in the controller, and rounding will calculate the discharge times per hour as 2.This leads to large errors. And the setting of the target flow should not be less than the target value, otherwise the controller will alarm and prompt, unable to start.

2. The controller only calculates the time needed for discharging interval when it is start, and the discharging interval will not be adjusted according to the actual discharging quantity of each scale during operation.

5.3 Material Level Control

Different application, the packing scale storage bin of the material level device installation is divided into three situations: three material level (FULL, -OK-, EMPT), double material level (FULL, EMPT), single material level (EMPT) and no material level device.

5.3.1 Three Level Material Position

When FULL, -OK-, EMPT level are defined (i10/i11/i12 is defined), controller is in the logical control process of three levels. At this point, three level devices should be installed in the FULL, -OK-, EMPT positions on the equipment hopper to input corresponding signals to the controller. The specific logical control process is as follows:

	-OK-	EMPT	Control process
valid	valid	valid	FULL, -OK-, EMPT level are valid, indicating that the silo is full at present.
invalid	valid	valid	If FULL level is not valid, it means that the hopper is not full.
invalid	invalid	effective	-OK-, EMPT are invalid, EMPT level is valid, indicating that there is still material in the hopper, but the material is nearly used up. At this point, the meter will output the "feed (O12)" signal to start feeding to the hopper, until the feeding level becomes effective, indicating that the hopper is full, stop the output of "feed (O12)".
invalid	invalid	invalid	FULL, -OK-, EMPT are all invalid, which means that there is a serious shortage of materials in the silo at present. The controller will stop the feeding process and wait for the material supply from the silo until the cutting level is effective. The controller will not start the feeding process until the cutting level is effective.

The -OK- level input is used to judge whether the feeding should be started or not. At this point, the feeding process of the instrument does not have to stop (the feeding process is stopped after the blanking level is invalid). Therefore, compared with the logic control of the two material levels, the three material levels can reduce the interruption of the feeding process caused by the lack of materials, thus increasing the output.

5.5.2 Double Level Material Position

The FULL, EMPT levels are defined, i. e., I10 and I12 are specified as input

quantities, corresponding to the double level situation. At this point, controller has the feeding control function, the control principle is when the input of FULL, EMPT levels are invalid, the output of the controller is effective; When the feed level input is valid, the feed output is invalid. At the same time, before each feeding (coarse, fine), the controller will detect whether the feeding level is effective, if not, wait for the signal; Only when this signal is valid can the feeding process begin. During the feeding process, the controller does not detect whether the feeding level signal is valid or not.

5.5.3 Single Material Level Position

The EMPT level is defined and the feeding level is not defined; that is, only I12 is specified as the input quantity, corresponding to the single level situation. At this point the controller will not be controlled for feed. It only detects the blanking level before feeding. If the blanking level is invalid, wait for the signal. Only when this signal is valid can the feeding process begin. During the feeding process, the controller does not detect whether the feeding level signal is valid or not.

FULL, EMPT material levels are not defined, corresponding to no material level device. At this time, the controller does not control feeding, nor does it test whether the cutting level is effective before feeding.

5.4 Usb Flash Drive Upgrade Software

The steps are as follows:

1.	Insert the usb flash drive into the computer and create a new "m04-5" folder in the usb flash drive;
2.	Save the file "m04-upload.gm" into the folder "m04-5";
3.	When the instrument is in the main display interface and in the stopped state, plug the U disk into the USB port of the instrument, and the "system prompt" dialog box will pop up automatically, indicating "key: 1-update firmware 2-update boot interface";
4.	Press the system prompt to select the key [1].The prompt box will say "firmware update or not!"Press [Enter] to start the firmware update process. Power off or usb flash drive is not allowed.If the power is cut off or the usb flash drive is unplugged, the software version before the upgrade will be retained after the power is restarted, which will not affect the use. The usb flash drive can be inserted again to update. After the progress bar is finished, the upgrade will be successful, and the meter will be automatically restarted.

5.5 Usb Flash Drive Upgrade Startup Interface

The steps are as follows:

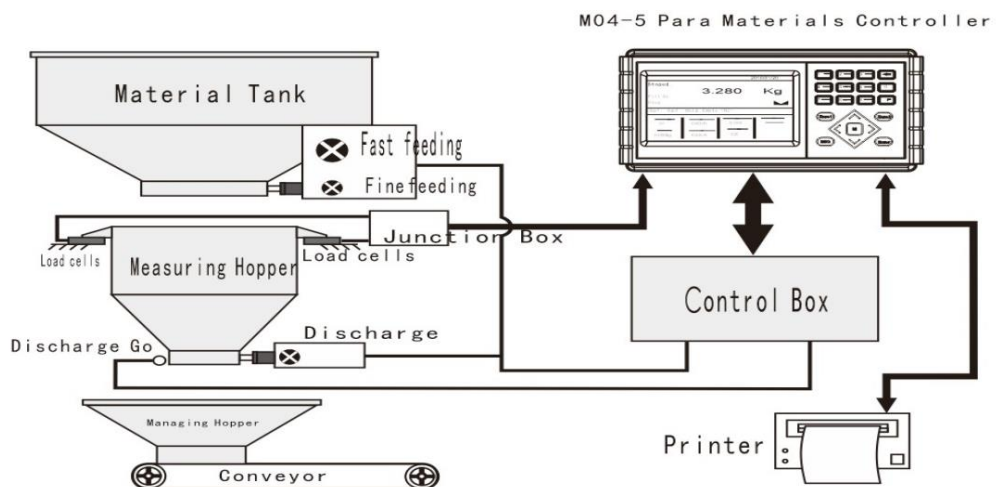| 1.	Insert the usb flash drive into the computer and create a new "m04-5" folder in the usb flash drive;
2.	Save the file "m04-logo.bmp" (resolution 800*480) into the folder "m04-5";
3.	When the controller is in the main display interface and in the stopped state, plug the U disk into the USB port of the controller, and the "system prompt" dialog box will pop up automatically, indicating "key: 1-update firmware 2-update boot interface";
4.	Press the system prompt to select the key [2].Then the system prompt box content will become "whether to update the boot interface!"Press [Enter] to start the picture update process. Power off or pull out the usb flash drive is not allowed at this time.If the power is cut off or the usb flash drive is unplugged, the picture before the upgrade will be retained after the power is restarted, which will not affect the use. The usb flash drive can be inserted again for update. After the upgrade, the controller will restart automatically.

6. Bulk accumulation process

The m04-5 bulk accumulation controller can automatically control the fast and slow feeding and the whole metering and accumulation process of feeding under the running state.There are two modes of operation: receiving mode and dispatching mode.

In the stop state, the user can select the "receive and ship mode" by pressing [◀] under the menu or the default number key of shortcut [6]. Support "receiving", "shipping" mode.

model	Receiving mode	The delivery mode
Differ-ence	Unreceived total	Total amount of goods to be delivered（range 0~999999999）
	Receive goods continu-ously until external input "urgent stop or slow stop" signal, stop.	After the total amount of delivery is com-pleted, the controller will give an alarm and stop. At the same time, the controller will display："delivery completed" and stop after the alarm is cleared.
E-stop	During the operation, the input emergency stop controller will stop im-mediately, and the next start will be followed by the accumulated weight of the last delivery.	During the operation, input [emergency stop], controller enters the stop state, and the next start will be followed by the accu-mulative weight of the previous receipt and shipment；If you want to change the total num-ber of shipments, you can modify the total num-ber of new shipments through the instrument panel after shutdown. After modification, press [start] to make the controller continue to run and continue to complete the delivery process.When the total quantity of shipment is modified, the controller keeps the cumulative value of the shipped quantity (the value cannot be reset arti-ficially, otherwise, the meter will start to ship again from 0 by default).
Enter stop	During the operation, the input delay stop controller will stop feeding immediately and enter the state of fixed value and unloading. After discharge, an alarm will be issued and the unloading will be suspended. At the same time, the controller will display："delivery completed" to complete the receipt and delivery.The user can press [Esc] or make "clear alarm" input valid, clear the alarm and return to the stop state. To start again, the next round of feeding shall be started only after clearing the last "collection and delivery accumulation".	

Note: only in delivery mode can the total amount be set.

Its structure is shown in the following figure:

MO4-5 Para Materials Controller

Material Tank

Fast feeding

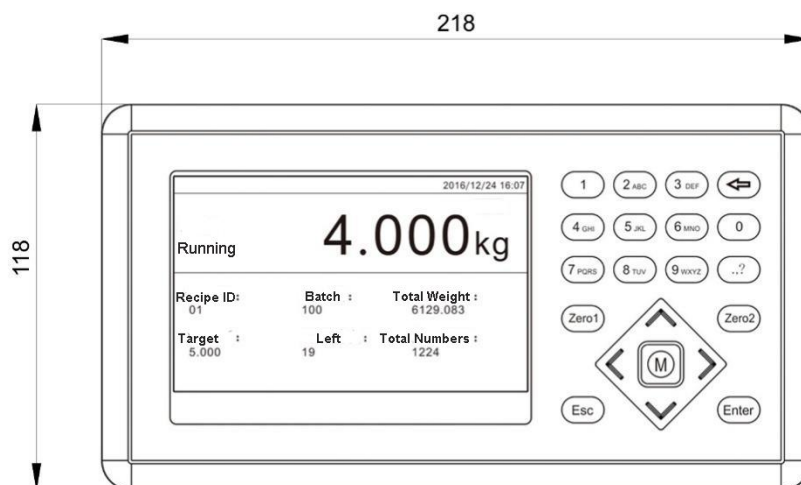Fine feeding

Junction Box

Load cells   Measuring Hopper   Load cells

Discharge Go   Discharge

Managing Hopper

Conveyor

3.280   Kg

Control Box

Printer

Basic process description:

```
┌──────────────┐
│    Start     │ <----->  Set the target value non-0. After the input start signal, judge
└──────────────┘          EMPT level signal. If EMPT level signal is invalid, wait
  Feedling Start Delay     for the EMPT level signal to be valid.

┌──────────────┐          If " FILL-GO " is defined in the input of I/O module, then
│   Feeding    │ <----->  the external input feeding permission is required to be
└──────────────┘          valid. After the delay before feeding ends, start feeding;
                          If the "feed permit" is not defined, the feed can be started
                          without waiting for the feed permit.

┌──────────────┐          After start, in order to avoid overshooting, the weight is
│  Coarse feed │ <----->  not judged in " COMP.Inhibit imer(Co-F)".After this time,
└──────────────┘          the controller monitors the weight in real time. When the
  COMP.Inhibit imer(Co-F)  material weight ≥ the target value - Co-Feeding Remains,
                          enter the finefeeding process.

┌──────────────┐          After slow start, in order to avoid overshoot, the weight
│   Fine feed  │ <----->  is not judged in " COMP. Inhibit Timer(Fi-F) ".After
└──────────────┘          this time,controller monitors the weight in real time.
  COMP. Inhibit Timer(Fi-F) When material weight ≥ target value - Free Fall, enter
                          into the value process.

┌──────────────┐          After the "Result Waiting Timer" is completed, controller
│Result Holding│ <----->  will perform Over&under (Over&under detection is on)
└──────────────┘          or output discharge (Clogged(In)).
  Result Waiting Timer

┌──────────────┐          Over&under judgement is secondary function, if the
│Over&under judgement│ <---->  recipe paremeter function is not on, it will not go
└──────────────┘          through the corresponding process, enter discharge pro-
                          cess.

┌──────────────┐          1) judging weight: material ≤ zero zone value;
│  Discharge   │ <----->   2) Start "Discharge Delay Timer";
└──────────────┘          3) if the last scale is judged to be " Delivery Done ", an
                          alarm will be given; otherwise, the next scale will be "
┌──────────────┐          Feedling Start Delay ".
│ Back to zero │ <----->
└──────────────┘
  Discharge Delay Timer

  ( Next process )
```
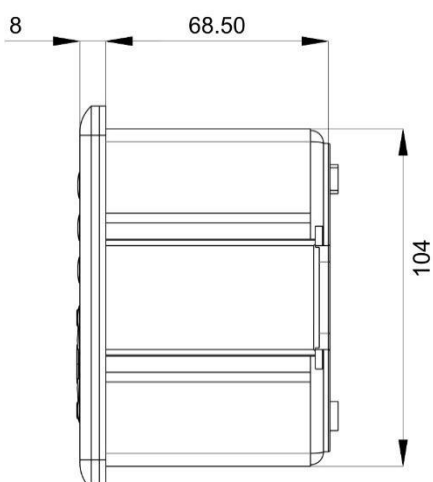
7. Instrument dimensions

Front frame size

Lateral size

Mounting hole size