GENERAL MEASURE

杰 • 曼 • 科 • 技

GMC-X1LF

Instruction manual

110612010003

V01.10.10

 **Warnings**	The product is powered by **DC24V power** supply, misuse of **AC220V power supply will permanently** damage the instrument.
	Keep the instrument well grounded.
	The product is an electrostatic sensitive device. Take ESD measures during use and maintenance

Standards & Certifications	Product standard: **GB/T 7724-2023** **Verification Regulation: JJG 649-2016** **CMC accuracy** grade 3 (6000e)**; Guangdong system** 0000000048**;** Safety certification: **CE**

Contents

Chapter 1 Overview

1.1 Functions **and features**

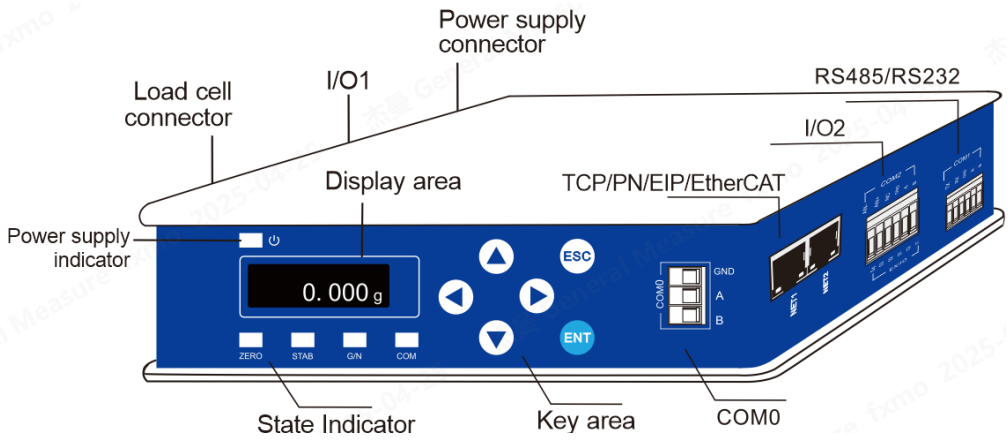
Shell Type	**DIN** rail mount, stainless steel housing	
loadcell interface	**1 way** 6-wire analog loadcell interface for up to **8** 350Ω loadcells	
Display	**128*32** 0.91 **"white light** OLED	
Language	Chinese and English are supported	
Scale structure	Single increment, Multi increment, Multi reduction, three modes are available.	
Interface	**1** way **485** interface, **1** way **485/232** interface	
	Support **5** in **9** out transistor input/output interface	
	Optional interface	Dual network port with built-in switch
		Single network port communication port
		Profinet Bus interface
		Ethernet/IP bus interface
		EtherCat bus interface

1.2 Technical **Specifications**

Power supply	**24VDC** (**18 to 30VDC**)
Housing size	**131 * 111.4 * 32** (**mm**)
Product weight	**500g**
Certified use environment	**-10 ~ 40℃;** No condensation in 90%R.H
Use environment	**-20 ~ 60℃;** No condensation in 90%R.H
Storage environment	**-40 to 60 ° C;** No condensation in 90%R.H
Power dissipation	**5W**
Load cell excitation voltage	**5V 200mA**(**MAX**)
Load cell requirements	**1** analog loadcell interface, up to 8 350Ω loadcells, support **1mV/V, 2mV/V, 3mV/V** sensitivity
Input sensitivity	**0.1** uV/**d**
Nonlinear	**0.01% F.S**
A/D sampling speed	**50**; **60**; **100**; **120**; **200**; **240**; **400**; **480**; **800**; **960** (**SPS**)
Maximum display accuracy	**1/999999**
Keys	6-key sounding keyboard
Decimal point position	**0, 0.0, 0.00, 0.000, 0.0000; 5 options;**
Overload Display	Weight overload

Chapter 2 Panel and keys

2.1 Front Panel description



Status indication:

- **:** Power supply, when the instrument is powered on, the indicator lights up.
- **ZERO:** Zero Point, when the weight is **0±1/4d,** the indicator lights up.
- **STAB:** stable. When the weight changes within the stable range, the indicator lights up.
- **G/N :** gross/net weight. when the current weight is net, the indicator lights up.
- **COM:** Communication indicator, Communication indicator parameters of system information in system maintenance could define the COM indicator, indicating which communication port status. The range can be defined: serial port 0, serial port 1, network port.

  There are the following cases:

  (1) When the communication indicator define as serial port, the indicator blinks when the serial port is used for data communication.

  (2) When the communication indicator define as network port:

i. When common network port or EIP is communicating, the indicator blinks.

ii. When the PN communication connection is established, the communication indicator is steady on, and the communication indicator will blink at a frequency of 1HZ after the LED indicator is flashed.

2.2 Key **Description**

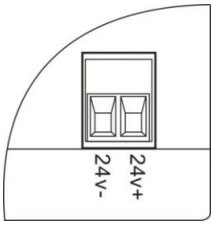
The **GMC-X1LF** has a total of **6** key functions, and the functions of short press and long press are different. The key schematic diagram is shown in the following picture:

Keys	Interface	Short Press	Long Press
▲	Main interfce	/	Switch display: Weight/Loadcell voltage value
	Menu interface	Previous SubParameter	/
	Data input	Data or letter +1	Switch between uppercase and lowercase letters
	Option select page	Previous SubParameter	/

	Main interfce	View the cumulative batches and weight	Switch display： Gross/Net weight display
	Menu interface	Previous SubParameter	/
	Data input	Data or letter **-1**	Data Zero when Input pure numbers
	Menu interface	Switch to the next SubParameter	/
	Main interfce	Set the number of batches	View the number of batches remaining
	Menu interface	Switch to the previous SubParameter	/
	Data input	Move the number position to the left	/
	Option select	/	/
	Main interfce	Tare	View the tare weight
	Menu interface	Switch to the next main option	/
	Data input	Move the number position to the right	/
	Option select	/	/
	Main interfce	Go to the menu interface	Quickly view the software version and compile date
	Menu interface	Confirm selection	/
	Data input	Confirm selection	/
	Option select	Confirm selection	/
	Main interfce	Zero (within zero range, gross weight mode is valid)	Zero calibration (valid in gross/net weight mode, net weight mode calibrate zero, auto return to gross weight)
	Menu interface	Return to previous level	/
	Data input	Exit	/
	Option select	Back to the main interfce	/

Chapter 3 Installation and wiring

3.1 Connect power cables to the controller



GMC-X1LF weight transmitter makes **24V** power supply. The wiring of the power terminal is shown below:

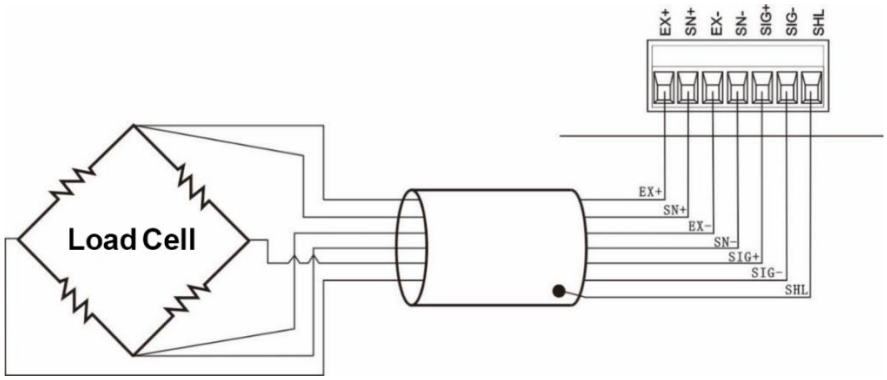
NOTE： The transmitter uses DC24V power supply, use AC220V power will cause permanent damage to the transmitter.

3.2 Loadcell Connection

The GMC-X1LF weight transmitter needs to be connected to an external resistance strain bridge weighing loadcell, and each port of the connection terminal is allocated to:

Ports	**EX+**	**SN+**	**EX-**	**SN-**	**SIG+**	**SIG-**	**SHL**
Six wires	Power positive	Sensitive positive	Power negative	Sensitive negative	Signal positive	Signal negative	Shielded wire
Four wires	Power positive		Power negative		Signal positive	Signal negative	Shielded wire

※ When connecting a four-wire loadcell, the **EX+** and **SN+** ports, **EX-** and **SN-** ports must be shorted. Otherwise, the weight data of the instrument is not read properly.



NOTE：

1.As the output signal of the load cell is an analog signal sensitive to electronic noise, shielded cables should be used for load cell wiring and laid separately from other cables, especially away from ac power supply

2.For the occasions with short transmission distance and little temperature change or low accuracy requirements, four-wire load cell can be selected.However, for applications requiring high transmission distance or accuracy, a six-wire load cell should be selected.

3.For the application of multi-load cell parallel connection, the sensitivity (mV/V) of each load cell should be consistent.

3.3 IO **module interface connection**

GMC-X1LF weight transmitter provides **3** input **5** output, extended **2** input **4** output (**5** in/**9** out)

Standard **IO** adopts transistor output mode, each drive current **200mA**. The factory default low level of input and output interfaces is effective. For details on IO Module, see section 8.2 I/O Port Configuration.

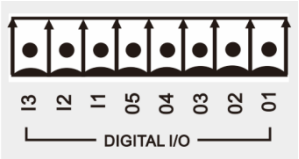


Figure: IO module interface 1

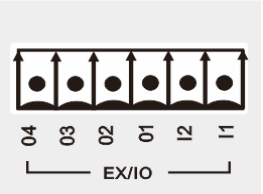


Figure:IO Module expansion interface **2**

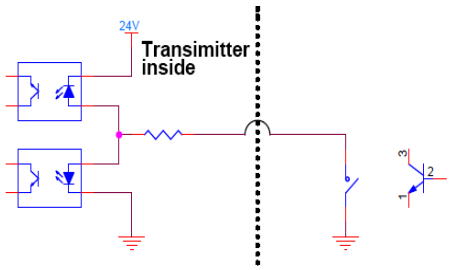
IO Module wiring description:

Connect the instrument with the external device through the wiring, control the instrument through the external input for starting, zeroing, printing and other operations, and display the current state of the instrument through the output, such as the running state, coarse, medium and fine feed signal output.

Input interface connection: Connect the terminal of the external control device to the input terminal of the controller one to one, and test the connection through the input test in the【IO Test】 under the【Maintenance】.Connect successfully, enter the 【Input Cfg】under 【Application】, set the function definition of each input port, for example, input port 1 is set to zero, at this time, press the corresponding external device connection port key, then the instrument will perform the zero operation (within the zero range). The function of other input ports is the same.

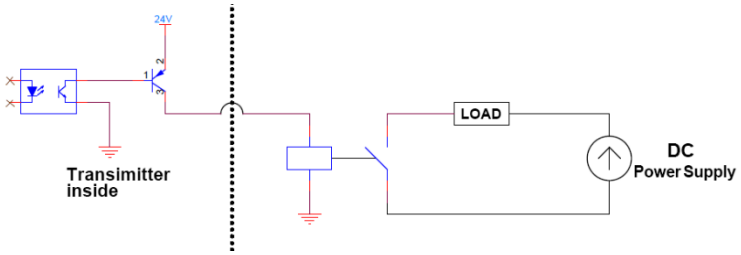
Output interface connection: Connect the external indicating device terminal to the output terminal of the controller one to one, by the IO test, test the connection. The connection is successful, enter the 【Output Cfg】 under 【Application】, set the function definition of each output port, such as output port 1 set to run, at this time the weight of the instrument is in the running state, the corresponding indicator of the external output port is on, at this time the instrument running signal output is effective. The function of other output ports is the same.

Instrument input interface schematic diagram:



Low level mode

Instrument output interface schematic diagram:

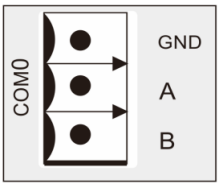


Low level mode

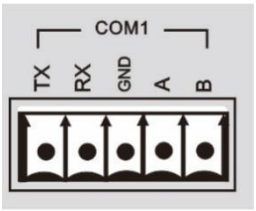
3.4 Serial Port Connection

GMC-X1LF instrument is equipped with **2** serial ports as standard: **1 RS485 port, 1 RS232/485** serial port (software parameter selection).

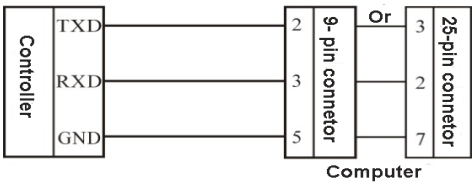
COM0: instrument standard serial port



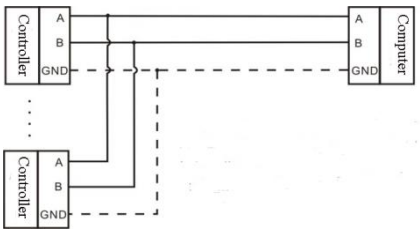
COM1: instrument standard serial port**, RS485**/**RS232** mode is optional (serial port mode is selected in serial port parameters)



RS232 connection mode:



RS485 connection mode:



※ In **RS485** mode, **GND** is the signal ground. In the case of serious interference, low resistance wires should be used to connect the signal ground, so that the ground potential of each node is equal, which can significantly improve the communication quality.

※ The **GND** must be connected in **RS232** mode.

3.4.1 Serial Port Troubleshooting

If the serial port fails to communicate, check:

○ Click the figure above to check the cable connection. Make sure the wiring is correct. The RS232 interface must be connected to all three wires**, Rx, Tx, GND**.

The RS485 interface must be connected to A and B wires.

○ Ensure that the parameters of the connection port are consistent with those of the host.Slave number, baud rate, data format and communication protocol must be consistent with the host computer and **PLC**.

3.5 Network Port Connection

GMC-X1LF products support ordinary network port communication and bus communication (bus communication is optional, order need to declare). Support **TCP** protocol (**Modbus/TCP, Cont-A/TCP, Cont-B/TCP, r-Cont/TCP, rE-Cont/TCP, YH/TCP**)

and **EIP**/**PN**/**EtherCat** bus protocol

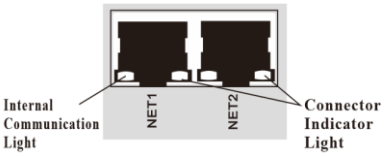
1)When option is Dual network port, network port built-in switch, easy to cascade, support **TCP** protocol.

2)When **PN/EIP** communication, it can connect to any network port of the instrument for communication.

3)When communicating with Ethernet CAT, Net2 serves as the entry point. When connecting to multiple devices, the devices must be connected in series to distinguish the order of entry and exit. For specific parameter settings, please refer to the communication manual of EtherCAT Communication.

3.5.1 Network port troubleshooting

If the network port is not communicating, check:



○ Check network port indicators.

The hardware connection is normal, and the internal indicator of the instrument is steady on.

The network cable is connected properly, and the connection indicator is blinking.

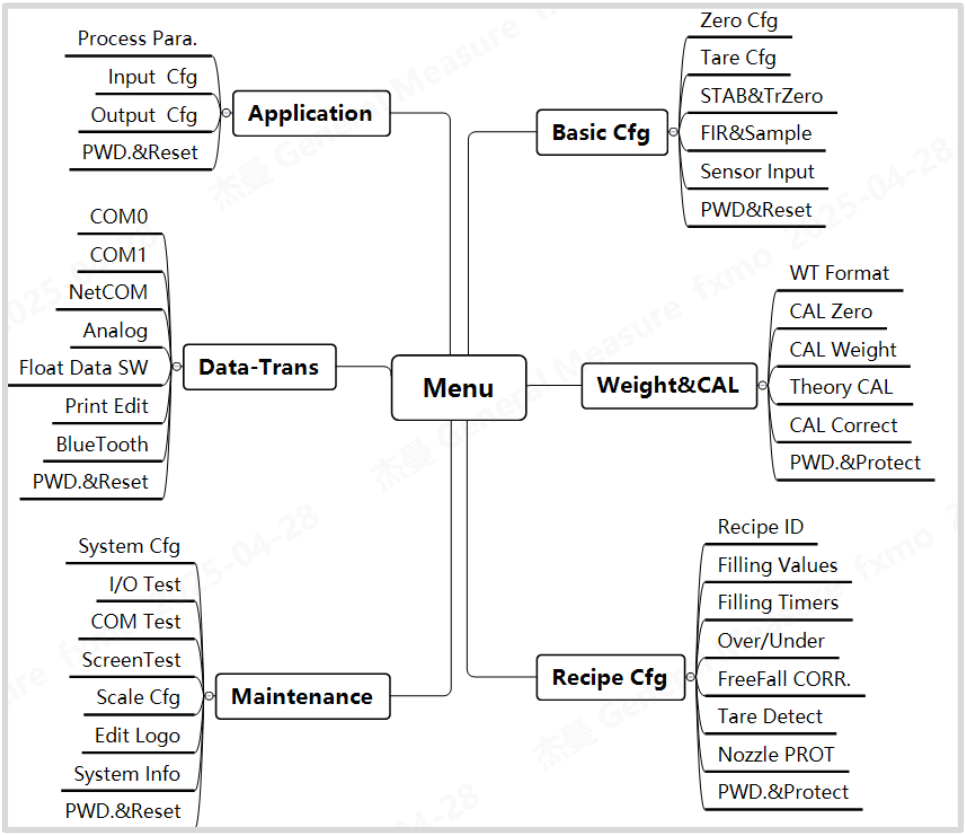
○ Check whether the communication protocol is consistent with the host computer and **PLC**.

○ Confirm that **GMC-X1LF** can be pinged by the network. If not, check the hardware interface section.

○ Check whether **IP** conflicts exist.

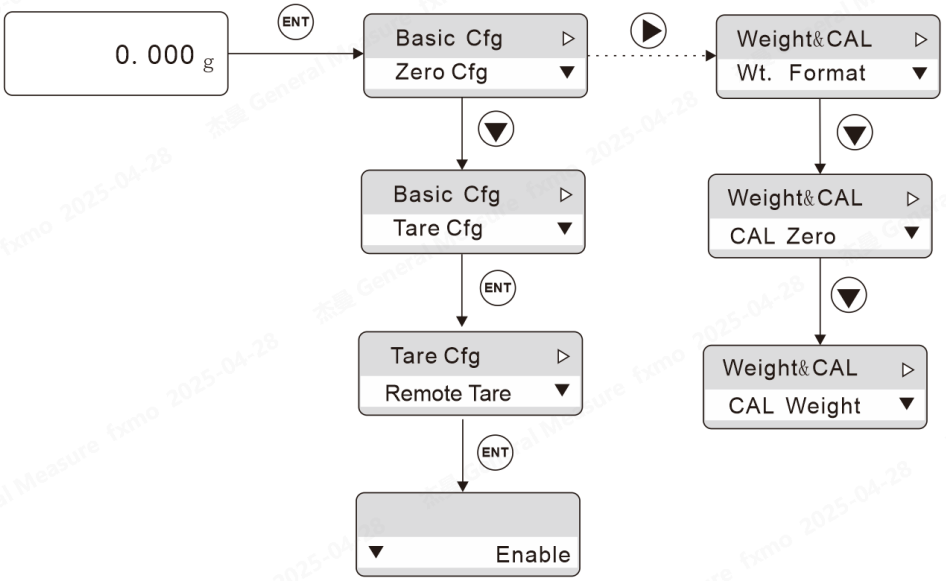
○ Restart the instrument.

Chapter 4 Menu overview

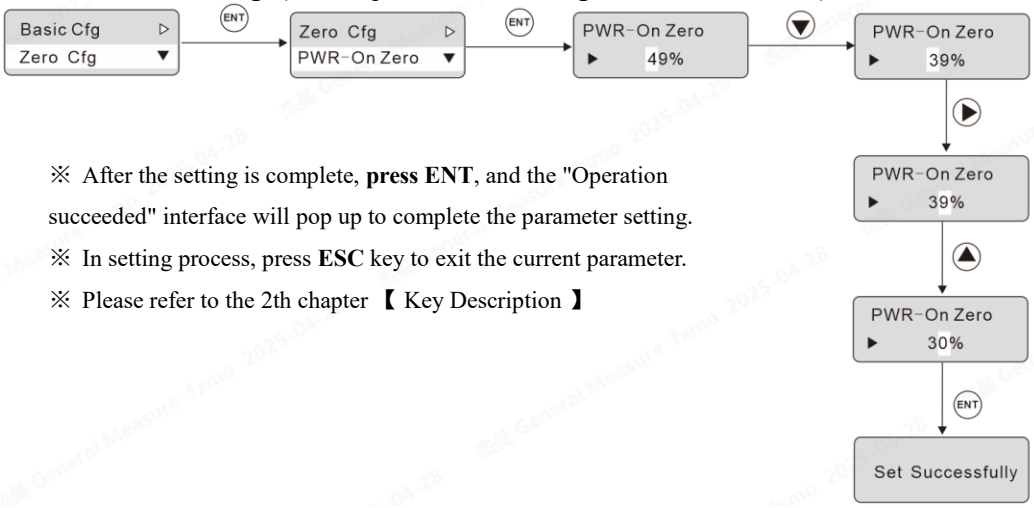


4.1 Parameter selection and setting

Parameter selection: (Select tare operation IO parameter Item)



Parameter value setting: (Set the power-on zero range from **49%** to **30%**)



※ After the setting is complete, **press ENT**, and the "Operation succeeded" interface will pop up to complete the parameter setting.

※ In setting process, press **ESC** key to exit the current parameter.

※ Please refer to the 2th chapter 【 Key Description 】

Chapter 5 Basic parameters

5.1 Basic parameters

Parameter Items	Initial value	Instructions
Zero Cfg		
PWR-On Zero	**0**	Range: **0** to **99(*** full scale %); When this parameter is set to **0**, disable the automatic zero function on power-on. Otherwise, perform zero operation according to the zero range during initial power-on.
Remote Zero	Enable	If this function is enabled, support zero operation through the communication interface. If this parameter is set to disable, Communication port zero cannot be performed.
Zero range	**20**%	Range: **1**~**99(*** full scale %)
Tare Cfg		
Remote Tare	Enable	Range: Enable,Disable; Set to enable for tare setting operation
Tare Record	Disable	Range: Enable, Disable; Set to enable, after power off and Power-On, the instrument still retains the previous tare weight.
NetSign COR	Disable	Range: Disable, correct tare, BackToGross. Disable: Not process negative net weight. **Correct Tare**: When the instrument is in net weight mode, if the weight is negative and stable, the instrument will treat the current actual gross weight as the new tare, keeping the net weight not negative BackToGross: When the instrument is in net weight mode, if the weight is negative and stable, the instrument automatically returns to gross weight mode.
Basic tare	**0**	Range: **0**~ range; Set the tare, if the value is not **0**, then when taring, using this tare for taring.
STAB&TrZero		
STAB Range	**1d**	Range: **0-99**, turn off the stability function when the parameter is **0**, the weight stability flag bit is always active. When the parameter is not **0**, during the stability judgment time, if the weight change range has not been greater than the set sub-reading, the weight is stable

STAB Timer	**1000ms**	Range: **1-5000** ms. If the weight change range does not exceed the stability range during this time, the weight is stable
TrZero Range	**1d**	Range: **0** to **99d**. Disable zero track function when the parameter is 0. When the parameter is not zero and the weight change is less than the zero range during the zero track time, the system will automatically track the zero point.
TrZero Time	**1000ms**	Range **1-5000ms**, in the zero tracking time, the weight change is less than the zero tracking range, then the system will automatically track the zero point
FIR&Sample		
Digit-Filter	**4**	Range: **0-9**; The larger the number, the higher the filtering intensity, but the instrument response time will be longer.
Adv. Filter	**00**	Range **0-99d**, when **0**, turn off the steady state filter. When the parameter is **non-0**, turn on the steady-state filter if the weight changes within the range
AD Sample Rate	**200**	Range: **50**; **60**; **100**; **120**; **200**; **240**; **400**; **480**; **800**; **960 (SPS)**.
Sensor Input		
Input range	**0-10mV**	Range: **0-5mV**; **0-10mV**; **0-15mV** instrument adjusts the signal acquisition range according to the input range to ensure more accurate mesuring.
PWD.&Reset		
Reset Basic	//	Perform factory reset operations on basic parameters
Remote Edit	Enable	After it is enabled, the basic parameters can be set through the communication port. Otherwise, the communication port is read-only to basic parameters.
PWD. Protect	Disable	Range: Enable,Disable; Password is required to enter the Modify parameter setting option after it is on
PWD. Edit	**000000**	Change the password. The password must be 6 characters long.

※ Note: The instrument is in the gross weight state when powered on, and when the tare is cleared, the instrument records the tare and enters the net weight mode.①

②The instrument cannot zero in the mode of net weight display

Chapter 6 Weight&CAL parameters

When the first use of GMC-X1LF weight transmitter or any part of the weighing system has changed and the current device calibration parameters can not meet the user's requirements, the indicator should be calibrated. The calibration can determine the system zero point position, gain and so on of the weighing system.

6.1 Weight&CAL parameters

Parameters	Initial values	Instructions
Wt. Format		
Unit	**kg**	Range: **t**; **kg**; **g**; **lb**
Decimal	**0**	Range: **0**; **0.0**; **0.00**; **0.000; 0.0000**
Division	**d=1**	Instrument indicates the minimum change in value Range: **1,2,5,10,20,50,100,200,500**
Full Scale	**10000**	The maximum indicator value of the instrument, generally take the loadcell range. Range: minimum division *200000 can be set. When out of range (" data out of range ") prompt information, so as not to damage the loadcell by weighing overpressure.
CAL Zero		
Auto Capture	After emptying the scale, press the Enter key to take the current obtained voltage value status as the zero voltage.	
Key In mV	Manually enter the voltage of **4** decimal points manually as the zero point voltage	
CAL Weight		
Weight CP1 Weight CP2 Weight CP3 Weight CP4 Weight CP5	Calibration weight point, support **5** point calibration. When the previous point is calibrated, the other weight points will be reset to the uncalibrated state (the default value is **10.0000mV**, **10000kg).** For example, after calibration point **1**, calibration points **2-5** will be reset to **0**	
Theory CAL		
LC mV/V	**2.0000**	loadcell true sensitivity, **4** decimal points, if multiple loadcells is the average sensitivity
LC Capacity	**10000**	The true loadcell range, if there are multiple loadcells, is the sum of all loadcell capacitys
Use T-CAL	Disable	Range:enable;disable.Open the theoretical value calibration, so that the theoretical value calibration takes effect
CAL Correct		
CAL Correct	**1.00000**	After calibration, if the zero point is correct, there is a weight deviation, which can be used to correct the weight value. The calculation method of the value: if the instrument shows the weight is **A**, but the weight is **B** after weighing, the calculation method of the correction factor is :(actual weight **B** is the current correction factor)/ the displayed weight **A**
PWD.&Reset		
Cal Reset	//	Restore the calibration parameters to factory Settings (hardware protection switch must be off)

Remote Cal	Disable	Range: Enable;Disable; After enabling, the calibration parameters can be set through the communication port. Otherwise, the communication port is read-only to the basic parameters.
HWD. Protect	Disable	Range: Enable;Disable; When the hardware protection dip switch is in the **ON** position, the calibration is allowed.
PWD. Protect	Enable	Range: Enable;Disable; Password is required to input the modify parameter setting option after it is turned on, and password is required when switching.
PWD. Edit	**000000**	Users can change the calibration password

6.2 CAL Zero

CAL Zero means zero calibration of the scale.

There are two ways to calibrate zero: Automatic Obtain and manual input. When the new equipment or weighing structure is adjusted, the "auto capture" method must be used for zero calibration.

Auto Capture:

Calibration success condition: the scale is stable.

The Instrument interface displays the current millivolts. After emptying the scale, press the **ENT** key to mark the current state to zero.

Loadcell value
0.6688 mV

Key In mV:

Manually input the zero corresponding to the millivolt value, that is, the input value status is calibrated to zero.

Key In mV
00.0000 mV

※ Generally used for without weight calibration, the value recorded by the data recorded when the weight calibration is used for manual input.

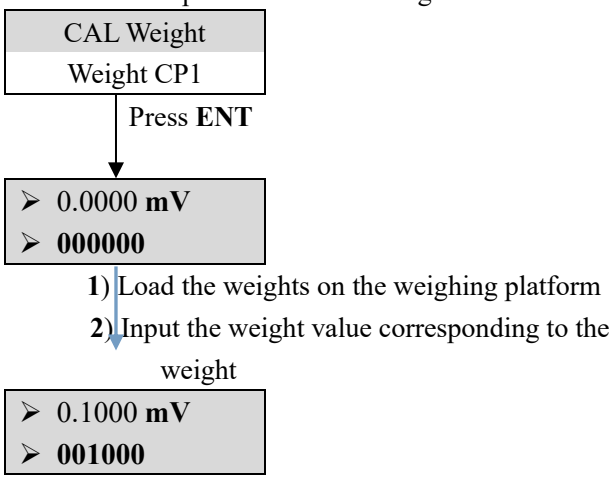
6.3 CAL Weight

CAL Weight means weight calibration with standard weights.

The instrument supports **5-point** calibration, which provides users with the maximum number of calibration points according to their needs.

Calibration method:

※ The zero point calibration should be completed before the weight calibration.



Multi-point calibration should be noted:

1） The user can choose the number of calibration points, such as single point calibration, after the calibration complete, the first weight point can exit.

2） Can not be calibrated across the point, otherwise appear "uncalibrated the previous gain point" alarm prompt. If the **3-point** calibration is used, it is necessary to calibrate the Weight CP**1**, the CP**2** and the CP**3**, but it is not possible to calibrate the calibration point **3** and the calibration point **4** after completing the calibration point **1**.

3） When the multi-point calibration, the weight weight needs to increase, such as the weight of the weight CP**2** must be greater than the weight CP**1**, otherwise the alarm of "the weight calibration is less than the previous point" will appear.

6.4 Theory CAL

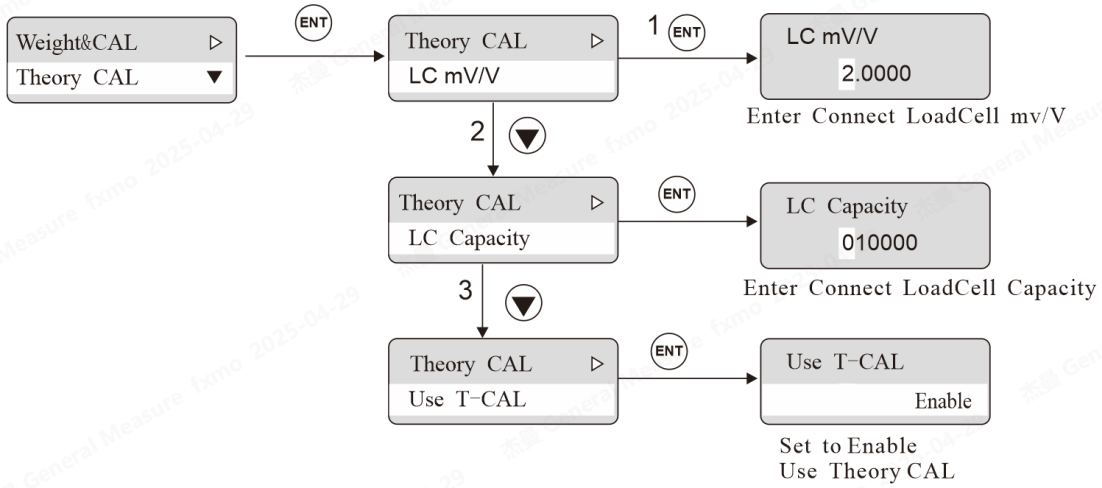
Theoretical value calibration refers to the weight calibration operation by connecting the loadcell sensitivity and loadcell range value through input.

Theoretical value calibration requires **3** steps:

1） Set the loadcell sensitivity (such as connecting multiple loadcells, input the average sensitivity)

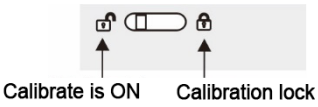
2） Set the total loadcell capacity (if connecting multiple loadcells, enter the total loadcell range)

3） Turn on the ""Use T-CAL " switch.



6.5 Calibration lock application

GMC-X1LF calibration has dual switch protection:



1） Remote calibration

The remote calibration switch is the communication port calibration parameter protection switch, which is limited by the hardware protection state.

When the hardware protection switch is on and the remote calibration switch is also set to on, the instrument calibration can be performed through the communication port. When the hardware protection switch is off, no matter the remote calibration is set to on or off, it is not allowed to be calibrated through the communication port.

2） Hardware protection

If this parameter is set to on, the status of the external hardware toggle switch is judged. If the external switch is turned on, the calibration is allowed. If the toggle lock is turned on, calibration is not allowed. If it is set to off, the hardware switch status is not judged.

Chapter 7 Recipe Configure

7.1 Recipe setting parameter content

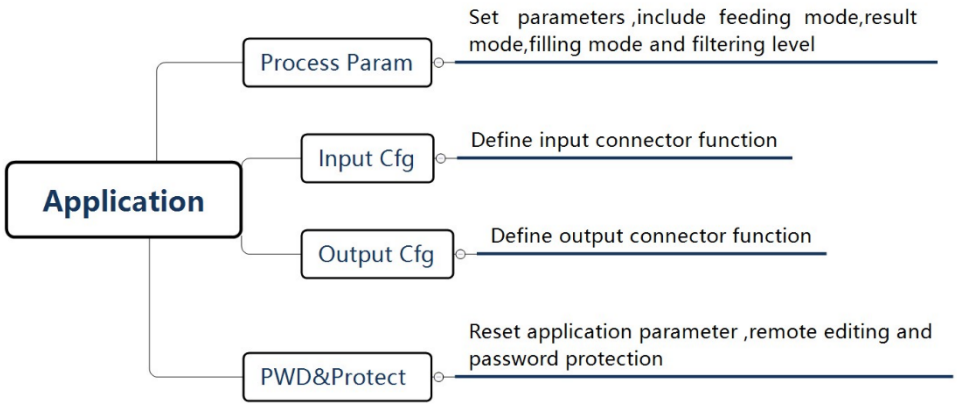
Parameter	Initial value	Instructions
Recipe ID		
Recipe ID	01	Range: 1-20; The recipe ID currently in use.
Filling values (Note: system maintenance of the scale body parameters of the scale structure of the display of target parameters are not the same, see the parameter description)		
Target	0	Range: 0~maximum range; The measured value per irrigation during the cumulative process.
Co-F Remain	0	Range: 0~ Max range; In the process of measurement, if the weighing value is ≥Target value – Coarse Remain, then close the Coarse Feed.
Me-F Remain	0	Range: 0~ Max range; If the output is defined, in the measurement process, if the weighing value is ≥Target value – Medium Remain, then close Medium Feed.
Free Fall	0	Range: 0~ maximum range; In the weighing process, if the weighing value is ≥ Target value – Free Fall, then close Fine Feed.
NearZero Band	0	Range: 0~ maximum range; In the feeding process, if the weighing value is less than or equal to the zero zone value, then the delay time of pushing the bucket is started (Note: when the scale structure is single increment and multi-increment, the parameter can be set)
Bucket Leak	0	Range: 0~ Max range; In the filling process, record the maximum weight, if the current gross weight is less than the difference between the maximum weight and the reduction protection threshold, then alarm. (Note: When the scale body structure is single increment or multi increment, the parameter can be set)
Co-Fi Mini-Flow	0	The value of the weight per second increased during coarse feed work. When the coarse feed flow rate is lower than this value, the instrument detects a Bucket leak by default, and the instrument output alarms and returns to the stop state. (Set to 0, turn off the function) (Note: When the scale structure is single-head increment and multi-head increment, the parameter can be set)
Nozzle Up SP1	0	When the filling weight reaches this preset weight and the step raise nozzle/raise nozzle has an output, its output invalid. (Note: When the scale body structure is single-head increment and multi-head increment, the parameter can be set)
Nozzle Up SP2	0	When the filling weight reaches this preset weight and the

		step lower nozzle /raise nozzle 2 has an output, invalidate its output. (Note: When the scale body structure is single increment and multi increment, the parameter can be set)
Supply Empty	0	When the instrument stops filling, if the material weight in the storage hopper is less than this lower limit value, the feed output is effective (this lower limit value must be greater than the filling target value, that is, it must be supplyed when it is insufficient to fill the next Bucket). (Note: when the scale body structure is multi reduction, the parameter can be set)
Supply Full	0	When the instrument stops filling, if the feed is performed, the feed stops when the level is reached. (Note: when the scale body structure is multi reduction, the parameter can be set)
Fast Wt Refresh	0	Range: 0~ Max range; Run turn to stop state, discharge to zero zone, displayed weight jump to the current weight value. (Note: When the scale body structure is single increment or multi increment, the parameter can be set)
Filling Timer		
Tare PDLY	0.5 s	Range: 0~99.9s; In the running state, at the beginning of each filling process, if the weight of the scale is greater than the near-zero zone value, the instrument will start delay before taring. After this time delay, if the tare detection switch is **ON**, the instrument will carry out tare detection. If the tare is in the tare detection range, will wait stable to tare.
Co-F Inhibit T	0.5 s	Range: 0~99.9s; During this time, the actual weight of the instrument is not compared with the target value - coarse feed reserve, and the weight judgment is made after the end of the forbid judge time.
Me-F Inhibit T	0.5 s	Range: 0~99.9s; During this time, the instrument does not compare the actual weight with the target value – medium feed reserve, and the weight judgment is made after the end of the forbid judge time.
Fi-F Inhibit T	0.5 s	Range: 0~99.9s; During this time, the instrument does not compare the actual weight with the target value - the free fall value, and the weight judgment is made after the end of the forbid judge time.
FreeFall DLY	0.5 s	Range: 0~99.9s; the delay time of stop fine feed to the weighing platform be stable, after this delay, the instrument perform the over/under judgment or directly output waiting signal. (Note: When the scale body structure is multi-head decrement, the parameter can be set)
Result Wait T	0.5 s	Range: 0~99.9s; When the waiting mode is waiting by time, the waiting hold time is started. When the time is

		reached, the waiting process is considered completed. The waiting weight at this time will add in the accumulation.
Nozzle Up PDLY	0.5 s	Range: 0~99.9s; In Nozzle raising stage, after this time, the output of the nozzle/nozzle raising signal is invalid. (Note: When the scale body structure is single increment or multi increment, the parameter can be set)
Nozzle Up DLY	0.5 s	Range: 0~99.9s; After the output of the nozzle/nozzle raising signal is invalid, it will enter the next stage after this delay time. (Note: When the scale body structure is single increment or multi increment, the parameter can be set)
Move Bucket DLY	0.5 s	Range: 0~99.9s; When the weight (gross weight) of the platform is less than the value of the zero zone, the delay time of pushing the bucket is started. When the time is reached, the instrument will turn off the signal of pushing the bucket. (Note: When the scale body structure is single increment, the parameter can be set)
OVER/UNDER		
Result Detect	Disable	Range: Disable, ON Not Pause, ON And Pause. For detection and suspension, when the feeding process appears over or under, the instrument suspend and waiting for user processing.
O/U Alarm T	2s	Range: 0~99.9s; When there is no manual clearing alarm, after this time, the over/under alarm will turn off by itself.
Over Limit	0	Range: 0~ maximum range; In the feeding process, if the weighing value ≥ the target value + the over value, it is judged as over.
Under Limit	0	Range: 0~ maximum range; In the feeding process, if the weight ≤ the target value - the under value, it is judged as under.
Max. Counts	0	Range: 0~99; When under replenish status, feeding one cycle (valid time + invalid time) is replenish once. After the replenish times exceed the set value, stop feeding, and output the waiting signal after re-judging the over/under.
Fill-ON T	0.5 s	Range: 0~99.9s; When replenish output, in an on-off cycle, the fine feed valid time
Fill-OFF T	0.5 s	Range: 0~99.9s; When feeding output, in a on-off cycle, the fine feed invalid time.
Free Fall CORR.		
Ref. Counts	0	Range: 0 to 99; The instrument takes the average of the set number of free fall as the basis for free fall correction..
CORR. Range	2.0%	Range: 0~9.9%; Percentage of the target value, when this free fall exceeds the set range, this free fall will not be add in the arithmetic average range

CORR. Degree	50%	The amplitude of each free fall correction. Range: 0:100% correction; 1:50% correction; 2:25% correction
Tare Detect (Note: when the scale structure is single increment or multi increment, the parameter can be set)		
Tare Detection	Disable	Set to "Enable"; Tare detection will be performed on startup.
Tare Up Limit	0	Range: 0~ Max range; The upper limit of the tare detection range.
Tare Low Limit	0	Range: 0~ Max range; Lower limit of tare detection range.
Use Preset Tare	Disable	Set to " Enable "; Tare detection stage If the tare is out of range (greater than the tare lower limit), use the formula tare as the fixed tare
Bucket Tare	0	Range: 0~Max range; Set the value of the taring parameter
Nozzle PROT (Note: when the scale structure is single increment or multi increment, the parameter can be set)		
Nozzle PROT	Disable	Set this parameter to Enable. Prompt warning if the weight > the bump drum protection weight during the lower nozzle process before the filling start.
Bump Weight	0	Range: 0~ Max range; During the detection of bump Bucket protection, if the current gross weight - the initial gross weight before lower nozzle > bump Bucket protection weight, it is considered that the nozzle hit the Bucket
Bump Alarm T	2.0 s	Range: 0~99.9s; Bump Bucket alarm **IO** output duration time.
PWD.&Reset		
Recipe Reset	//	Perform factory reset operation for basic parameters
Remote Edit	Enable	After opening, the formula parameters can be set through the communication port. Otherwise, the communication port is read-only to the basic parameters.
PWD. Protect	Disable	Range: Enable, Disable; Password is required to enter the modify parameter setting option after it is on
PWD. Edit	**000000**	Modify the password. The password contains six characters.

Chapter 8 Apply Settings



8.1 Process **Parameters**

Parameter Items		Initial value	Instructions
Fill Speed CTR.		Single Ctrl	Coarse, medium and fine slow feed control mode selection: Single Ctrl, Single Ctrl Combo Ctrl: Coarse feed, medium and fine feed all work at the same time at first; then medium and fine feed work at the same time;then fine feed work. Single Ctrl: Coarse feed at first; then medium feed; finally fine feed.
Result Check		Stable Mode	Stable Mode: After completed the fine feed, the weight is stable means complete the waiting process. Delay Mode: After completed fine feed, the setting process is completed after the Waiting holding time. Stable&Delay: After completed fine feed, The weight is stable and the waiting holding time has passed, then the waiting process is completed.
Filling mode (Note: When the scale body structure is single increment and multi increment, the parameter can be set)		Net Filling	Gross Filling, Net Filling mode selection switch.
APP Parameters (Note: When the scale structure is single increment and	Fill Permit REQ	Disable	Range: Disable, Enable; If the input defines the "taring/liquid filling start signal, Enable: When running, it is not necessary to wait for the external "tare/start filling" input signal to be valid, and directly judge table then taring (net weight filling) or start filling liquid (gross weight filling);

multi increment, the parameter can be set)			Disable: When running, the external "tare/start filling liquid" input signal is valid before taring (net weight filling) or starting filling (gross weight filling).
	Fill 1st Action	Tare	Range: Tare,Nozzle Down Tare: during the operation of the instrument, when the delay before taring ends, the output signal of the lower nozzle is valid. Off Nozzle Down: During the operation of the instrument, when there is a delay before starting taring, the output signal of the lower nozzle is valid. On
	M-Fill To ACUM	Disable	Range: Disable, Enable; Set to " Enable ", when the "manual run once", the weight value is allowed to be add in the ACUM.
Proess FIRs	Proess FIRs CFG	Disable	Range: Disable, Enable; When the switch is on, feed filter level, waiting filter level and push bucket filter level takes effect
	Filling FIR	5	Range: 0~9; The filtering parameter in the feeding process, 9 has the strongest filtering effect.
	Wait Result FIR	7	Range: 0 ~ 9; Filtering parameters in the waiting process, 9 has the strongest filtering effect.
	Bucket Move FIR	3	Range: 0~9; Filtering parameters in the process of pushing the bucket, 9 has the strongest filtering effect.
Feeding Switch		Enable	Range: Disable, Enable; In reduction mode, start the replenish function judgment. Enable: Turn on the up/low level replenish function. Disable: Turn off the up/low level replenish function.

8.2 I/O port configuration

Instrument standard for **3** input interface and **5** output interface, extensible optional **2** input 4 output, can meet **5** in and **9** out of I/O functions. Realize the connection between the instrument and external devices.

Each input and output can be set by itself, different scale body structure, the definition of IO is different. The factory definition of input and output is as follows:

Single increment default definition:

Input		**Output**	
Input 1	I1 Start	Output **1**	O1 Running
Input 2	I2 E-stop	Output **2**	O3 Co-Fill
Input 3	I3 Stop	Output **3**	O4 Me-Fill
Ext. IN1	I5 ZERO	Output **4**	O5 Fi-Fill
Ext. IN2	I6 Clear Alarm	Output **5**	O6 Wait Result
		Ext. Out**1**	O7 DONE

	Ext. Out**2**	O10 Over/Under
	Ext. Out**3**	O14 Bucket Push
	Ext. Out**4**	O19 COM HeartBeat

Multiple increment default definition:

Input		**Output**	
Input 1	I1 Start	Output **1**	O1 Running
Input 2	I2 E-Stop	Output **2**	O3 Co-Fill
Input 3	I3 Stop	Output **3**	O4 Me-Fill
Ext. IN1	I5 ZERO	Output **4**	O5 Fi-Fill
Ext. IN2	I6 Clear Alarm	Output **5**	O6 Wait Result
		Ext. Out**1**	O7 DONE
		Ext. Out**2**	O10 Over/Under
		Ext. Out**3**	O11 Alarm
		Ext. Out**4**	O19 COM HeartBeat

Multiple decrement default definition:

Input		**Output**	
Input 1	I1 Start	Output **1**	O1 Running
Input 2	I2 E-Stop	Output **2**	O3 Co-Fill
Input 3	I3 Stop	Output **3**	O4 Me-Fill
Ext. IN1	I5 ZERO	Output **4**	O5 Fi-Fill
Ext. IN2	I6 Clear Alarm	Output **5**	O6 Wait Result
		Ext. Out**1**	O7 DONE
		Ext. Out**2**	O10 Over/Under
		Ext. Out**3**	O11 Alarm
		Ext. Out**4**	O19 COM HeartBeat

8.2.1 Definition of Input and output

The output and input ports can be defined according to the actual application, and the input and output switch values can be modified through Application —Input Cfg and Output Cfg. Each IO corresponding a code. The details are as follows:

Input port function description:

Code	Content	Meaning
I0	None	If the port number is defined as 0, the input port is undefined.
I1	Start	The effective instrument signal will enter the running state. This input is a pulse input signal.
I2	E-Stop	The signal input is valid, and the instrument will stop the feeding process. This input is a pulse input signal.
I3	Stop	When the signal input is valid, instrument will return to the stopped state after completing the current packaging process. This input is a pulse input signal.
I4	Pause	When the input is valid, the input will suspend the feeding process. When the instrument is in the suspended state, the running output signal will alternately flash, input start signal

		will continue the feeding process, input emergency stop, the instrument will return to the stopped state. This input is the pulse input signal.
I5	ZERO	In the stopped state, when the signal is valid, the instrument perform the zero operation. The condition is stable and within the zero range.
I6	Clear Alarm	Use to clear the alarm output of the instrument. This input is the pulse input signal.
I7	Change Recipe	This input is valid once, the recipe number increases by 1, and returns 1 when the recipe number is greater than 20. If the recipe target value is 0, that recipe will be skipped. This input is a pulse input signal.
I8	Print	When this signal input is valid, perform the print function.
I9	P_EMPTY_LINE	In the non-print state, when the signal input is valid, perform the feed paper function.
I10	Bucket ->Permit	If the allowable input of pushing bucket is defined in the IO module, it is necessary to judge whether the allowable input of pushing bucket is valid after weighing. If it is valid, the process of pushing bucket starts, and if it is invalid, wait.
I11	Tare/Fill Start	In the running state, after the empty bucket is weighed, the instrument will detect the signal, and if the signal is valid, the instrument will automatically tare (if the gross filling mode:does not tare), the filling process will be performed. This is the pulse input signal.
I12	Nozzle Down OK	Before taring delay end and wait this signal be valid to start filling. This input is a pulse input signal.
I13	Supply Full	A up level device for connecting to the storage silo at the front end of the filling scale. The input should be a level input
I14	Supply NotEmpty	A low level device for connecting the storage tank at the front end of the filling scale. The input should be a level input
I15	M Co-Fill (LS)	When the signal is valid，coarse feed signal output is valid, and when the signal is invalid，coarse feed signal output is invalid.
I16	M Fi-Fill (LS)	When this signal is valid, fine feed signal output is valid, and when this signal is invalid, fine feed signal output is invalid
I17	Start/EStop (LS)	If the signal is valid, the instrument will enter the running state, and if it is invalid, it will return to the stop state. This input is a level signal.
I18	Start/Stop (LS)	If the signal is valid, the instrument will enter the running state, and if it is invalid, it will return to the stopped state after completing the current packaging process. This input is a level signal.

I19	Run Once	In the stop state, when the input is valid, start feeding, the control process is consistent with the feeding process in the running state, and return to the stop state after the end of the waiting holding time t7. This input is the pulse input signal.
I20	Simulation Run	When the input is valid, simulate the feed control process according to different scale structure. (Note: See Section 10.3 Simulation Operation for details about the specific operation process)

Output Port function description

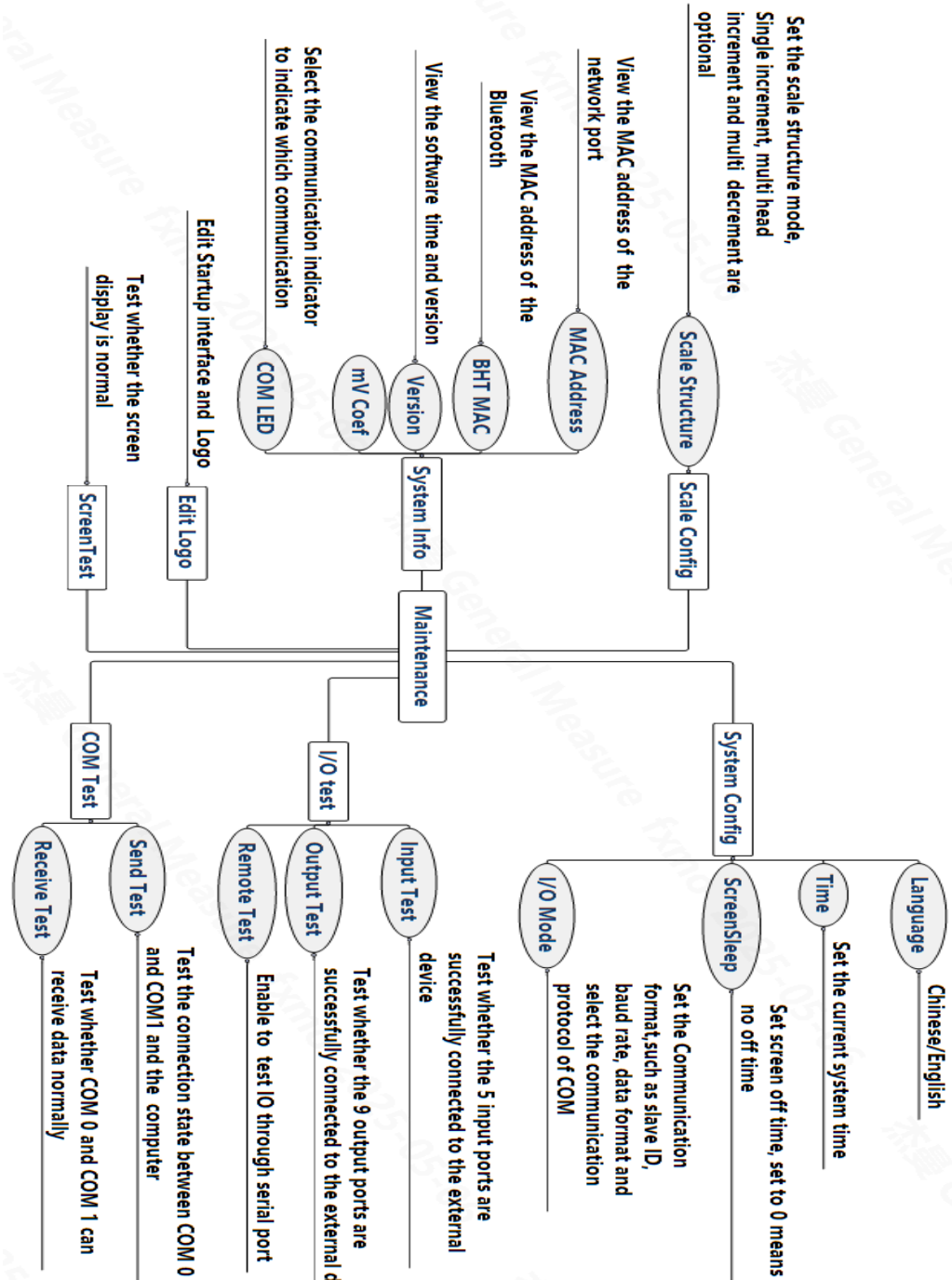
CODE	Content	Meaning
O0	None	If the port number is defined as no output, it means that the output port is undefined.
O1	Running	This signal is valid when the instrument is in run status.
O2	Stopped	This signal is valid when the instrument is in the stopped state.
O3	Co-Fill	Control large discharge port of the feeding mechanism. In the feeding process, the current weight < the target value – coarse reserve, this signal is valid.
O4	Me-Fill	Control medium discharge port of the feeding mechanism. In the feeding process, the current weight < target value – medium reserve, this signal is valid.
O5	Fi-Fill	Control fine discharge port of the feeding mechanism. In the feeding process, the current weight < target value – free fall, this signal is valid.
O6	Wait Result	When the instrument is finished feeding and be in waiting status, this signal is effective.
O7	DONE	After the setting is complete, the define output signal is valid.
O8	Supply Empty	This signal is valid when the liquid in the storage tank is below the low level.
O9	FILL Supplement	The feed used to control the front end of the filling scale for storage filling. The signal is valid when the liquid in the storage irrigation is lower than the lower level/lower limit; Liquid is higher than the upper level/upper limit, the signal is invalid
O10	Over/Under	Open the over/under detection switch, if over or under situation occurs, the signal is valid, valid time to maintain the over/under alarm time.
O11	Alarm	This output is valid when there is an error in the instrument.
O12	NearZero	This signal is valid if the current net weight is less than the set zero zone value
O13	Nozzle Bumped	This signal is effective when a Bucket bump is generated during the next lower nozzle

O14	Bucket Push	Used to push a bucket that has been filled. The signal is effective when the waiting time is over or when the output valid time reached.
O15	Batch Complete	This output is valid when the instrument has completed the set number of batches.
O16	Nozzle Down/Up	The signal is valid when the lower the nozzle. When lifting the nozzle, the signal is not valid. When using the lower nozzle function, an unused output port must be defined as O16
O17	Nozzle Up Step1	This signal is valid when lower the nozzle. Wait for the filling weight reached then step raise nozzle value 1 preset weight, then the output is invalid.
O18	Nozzle Up Step2	This signal is valid when lower the nozzle. Wait for the filling weight reached, then step raise nozzle value 2 preset weight, then the output is invalid.
O19	COM Heartbeat	The serial port transmits **1HZ** square waves.

8.3 Application password setting and reset

PWD.&Reset		
IO Reset	//	Restore the factory Settings of the input and output parameters
Except IO Reset	//	Restore other application Settings except IO parameters.
Reset All	//	Perform a factory reset operation on the application Settings parameters
Remote Edit	Enable	After enabling, the formula parameters can be set through the communication port. Otherwise, the communication port is read-only to the basic parameters.
PWD. Protect	Disable	Range: Enable, Disable; Password is required after enter the modify parameter setting option when it is on
PWD. Edit	**000000**	Change the password. The password contains six characters.

Chapter 9 System Maintenance



9.1 Maintenance

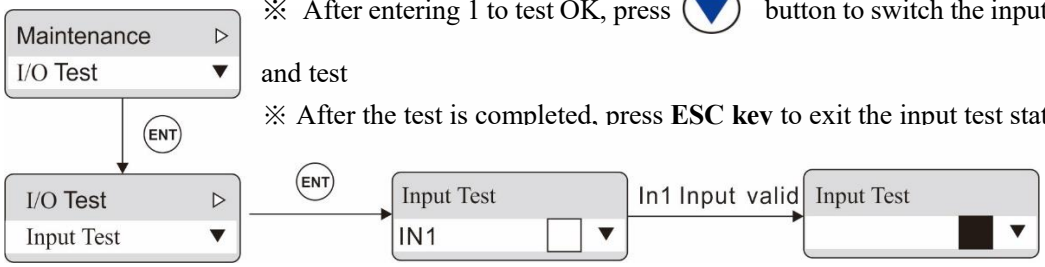
Parameter Items		Initial value	Instructions
System Config			
Language		Chinese	Chinese, English optional; Cannot be edited remotely.
Time		Current time	Display the current time.
ScreenSleep		600s	Range: **0~3600s**; can set the time when the screen is off.
I/O Mode	Norm IO	Low level	Currently only low level mode is available.
	Extra IO	Low Level	
I/O Test			
Input Test		Refer to Section 9.2 for details.	
Output Test			
Remote Test		Enable	Set to " Enable " to enter IO test mode via serial port.
COM Test			
Send Test		Refer to Section 9.3 for details.	
Receive Test			
Screen Test If the screen is white and the indicator light is all on, the screen is normal.			
Scale Config			
Scale Structure		Single Inc.	Single Inc.; Multi Inc.; Multi Dec.are optional.
Edit Logo Modify the startup Logo. Only support numbers, English letters, Spaces, and hyphens are supported. Long press the Up button to switch case. 8 characters are supported			
System Info.			
MAC Address		**BC-66-41-9x-xx-xx**	View the MAC address of the instrument, it can only be queried but not modified
BHT **MAC**		**D6-19-F9-54-4C-57**	View Bluetooth **MAC** address, can only be queried not modified
Version		**2021/07/09 18:10 01.00.00**	Contains the software version and compile date, can only be queried but not modified
Serial No.		//	Contains the serial number and 138 number, can only be queried and cannot be modified
MV Coef		**1.0000**	Used to calibrate the input voltage of the instrument loadcell, which can only be queried but not modified.
COM LED		COM**1**	Range: COM0, COM**1**, NetCOM; The COM indicator on the front panel blinks during communication
Password and Reset			
Partly RST.		//	Restore all parameters except calibration to factory Settings
Full Reset		//	Perform factory reset operation on all parameters
Remote Edit		Enable	When enabled, parameters can be modified by

		communication
PWD. Protect	Disable	Range: On, off; Password is required to enter the modify parameter setting option after it is on
PWD. Edit	**000000**	Modify the password. The password must be 6 characters.

9.2 I/O Test

The I/O test is used to test whether the I/O connection is normal.

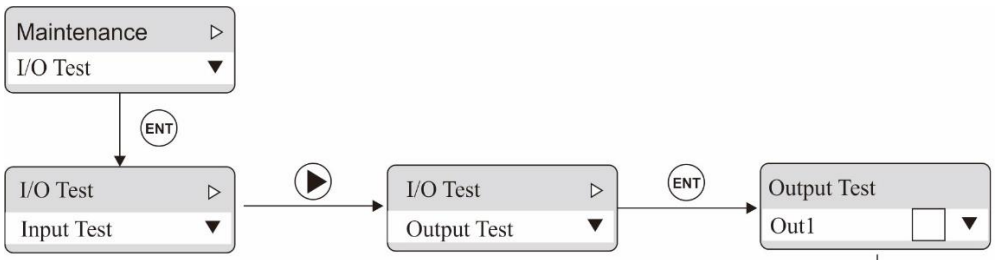
Input test:



※ After entering 1 to test OK, press button to switch the input port and test

※ After the test is completed, press **ESC kev** to exit the input test state

Output test:



※ In the output test state, press **ENT key to switch** the external output state.

※ The external state can be changed with the **ENT key switch**, indicating that the output port is connected normally.

※ After the test is completed, press **ESC** to exit the output test state.

Output1 Valid means Output connector state is ok

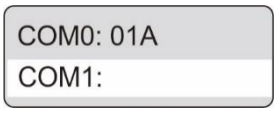
9.3 Serial **Port Test**

The function of serial port test is to send and receive data at a fixed baud rate **(9600)** and data format **(8-N-1)** to test the connection status of the serial port.

Send Test: Send data "**COMx Test nnn**". **X=1** if it is serial port **1**.

Receive Test: The external sends test data (only ASCii code) to the instrument and displays the data on the display, each frame data length cannot exceed 10 bytes.

If the external sends **30 31 41** to the instrument, and the instrument displays the following figure, it means that the **COM0** connection is normal.



Chapter 10 Function description

10.1 Supply Material control

Due to the different application conditions, the level device of the filling scale storage tank can be installed in three cases: double level (upper and lower level), single level (lower level) and no level.

This instrument distinguishes three situations by the definition of the input of the upper and lower level of the IO module. The control methods of each situation are different, and the details are as follows:

1) **Double material level**, the upper and lower level are defined, that is, **I13, I14** are specified as the input definition, at this time the instrument has the feed control function. The control principle is: when the input of the upper and lower level is invalid, the feed output of the instrument is valid; When the feeding level input is valid, the feeding output is invalid. At the same time, before each feeding (Coarse, medium and fine feeding), the instrument will detect whether the feeding level is valid, if not, wait for this signal; Only when this signal is valid can the feeding process begin. During the feeding process, the instrument does not detect whether the lower level signal is valid.

2) **Single material level**, the lower level is defined, the upper level is not defined, that is, only **I14** is specified as the input definition, at this time the instrument will not perform feed control, just detect the lower level before feeding, if invalid, wait for this signal; Only the signal valid start filling process. During the feeding process, the instrument does not detect whether the lower level signal is valid.

3) **No level device**, the upper and lower level are not defined, at this time, the instrument does not control the feed, and does not detect whether the lower level is effective before feeding.

When the scale structure is set to multiple decrement: the filling scale storage tank does not need the level control, and the instrument detects the level through the upper and lower limits of the level in the product formula parameters. In the filling process, the material level is not detected and controlled; In the stop state, the instrument will detect the current weight of the storage hopper and the lower limit value of the material level, if the current weight is less than the lower limit value of the material level, will perform supply material until the upper limit value of the material level to stop the feeding. The reasonable lower limit value of the material level must be greater than the target value, otherwise the material in the storage hopper is less than one filling process, and the filling is not allowed to start at this time, and the corresponding alarm will be prompted. During the feeding process, the filling is not allowed to start.

10.2 Bucket bump protection

If the function of bucket bump protection is required, the "bucket bump protection switch" in the formula parameter is turned on first. The optional configuration is:

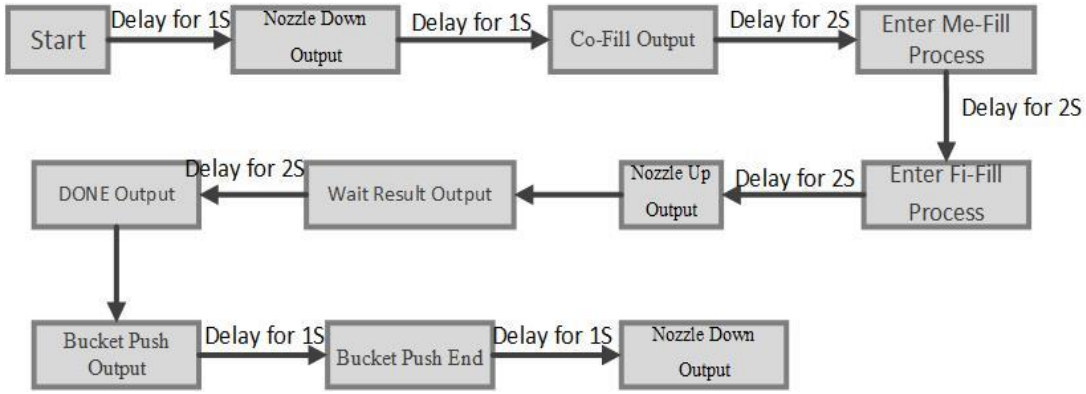
1） If the "Lower nozzle priority" is "lower nozzle first", the lower nozzle process: from the delay start before taring to the end signal be valid (the input defines the end signal of the **I12** Nozzle Down OK) or the end of the delay before taring (does not define the end signal of the **I12** Nozzle Down OK), the Bucket protection is detected during the lower nozzle time.

2） If the "lower nozzle priority" is "taring first", the lower nozzle process: starts after the delay before taring and ends after the lower nozzle end signal be valid (the input defines the **I12** Nozzle Down OK) or the delay before raise nozzle (does not define the **I12** Nozzle Down OK), and the Bucket bump protection is detected during the lower nozzle process.

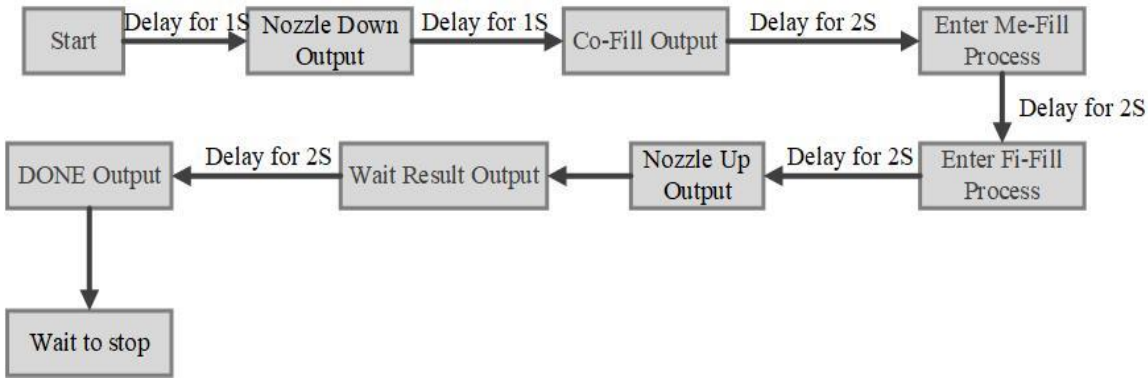
After the Bucket is stabilized on the weighing platform, if the current gross weight recorded by the instrument - the initial gross weight before lower nozzle > the drum bucket protection weight, it is considered that drum bucket during the lower nozzle process, and output the drum bucket alarm signal (the signal time is set by the drum bucket alarm time) and return to the stop state.

10.3 Simulation Operation

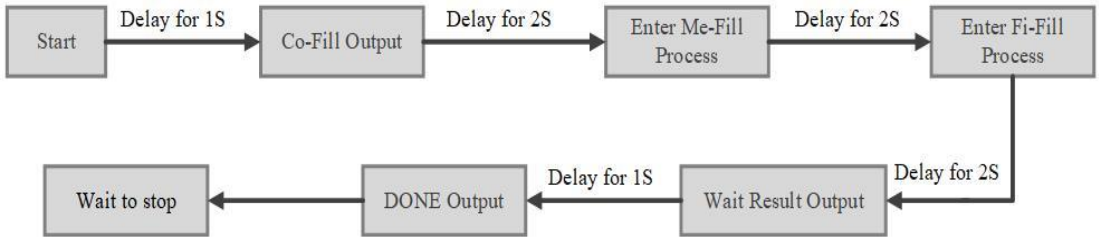
Single Increment



Multi-Increment



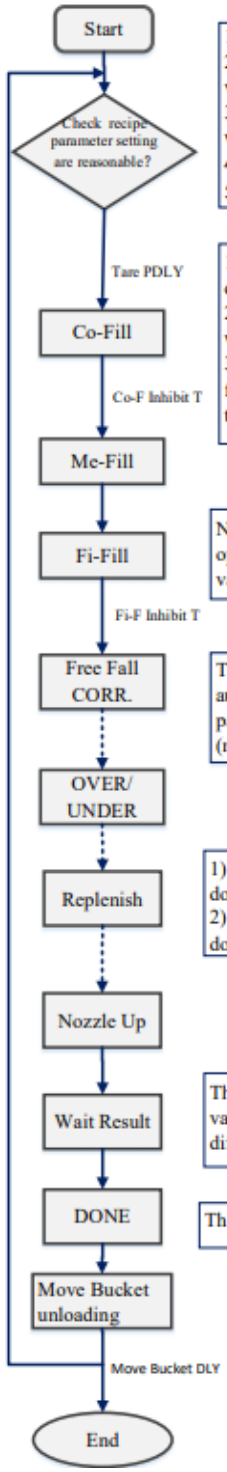
Multi-Decrement


Start
Delay for 1S
Co-Fill Output
Delay for 2S
Enter Me-Fill Process
Delay for 2S
Enter Fi-Fill Process
Delay for 2S
Wait Result Output
Delay for 1S
DONE Output
Wait to stop

Chapter 11 Working Process

11.1 Single Increment

Liquid Filling process instruction:



1)If the recipe parameters are set incorrectly,an error alarm will be output
2)If the lower level is defined and the operation signal is valid,it is judged that this signal is valid.
3)Load the bucket for inspection to determine if the weight of the empty bucket after being weighed is greater than the zero zone value.
4) If the Fill Permit REQ is turned on,wait for this external signal to be valid.
5)It is necessary to wait for this signal output be effective If nozzle down/up is defined.

1） According to the priority of nozzling down , conduct a barrel collision detection .For details,please refer to the bucket bump protection function description.
2)If the tare detection switch enabled,the tare weight detection will be carried out.If it is not within the tare weight range,stop.If within the range,the filling process will beign.
3)There are two filling methods,gross weight and net weight.After this delay ,gross weight :the filling process is carried out with each weight parameter as the gross weight value.net weight : the filling process is carried out with each weight parameter as the net weight value.

Note,during operation,if the emergency stop input is valid,it can return to the stop state. When in operation ,the stop input is valid.Once the instrument has completed filling and output the set value,it can return to the stop state.

The over and under judgment, Free fall correction and replenishment functions are packaging auxiliary functions. If the function switch in the recipe parameters is not turned on, the packaging does not go through the corresponding process and directly enters the nozzle down (nozzle down/nozzle up defined) or set value process.

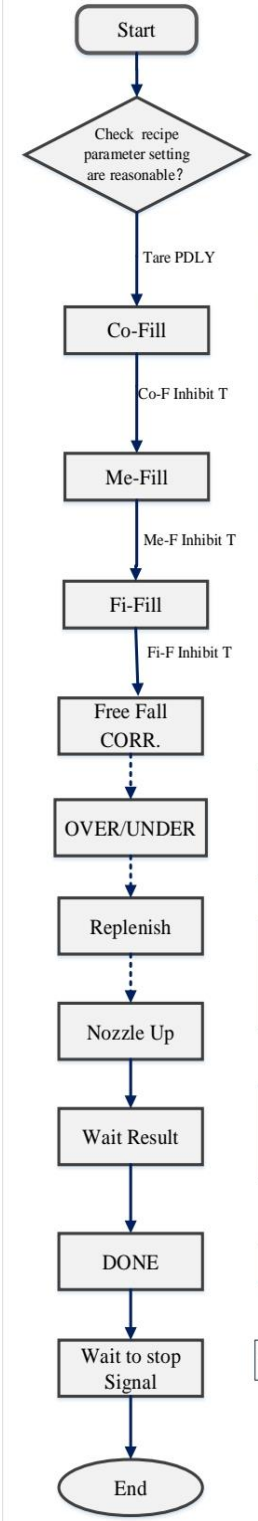
1) Use the nozzle down /up function; There must be an output port defined as an O16 nozzle down /up output.
2) If you need to use a nozzle up step, set stepped nozzle down/up output 1, steppednozzle down/up Output 2 and the corresponding nozzle up output value.

Three ways of setting values,Stable mode,Delay mode,Stable&Delay, After completing the value setting process according to the selected method,the correction process for over-difference,under-difference and drop begins.

The wait result is completed and the done signal is output.

11.2 Multi increment

Liquid Filling process instructions:



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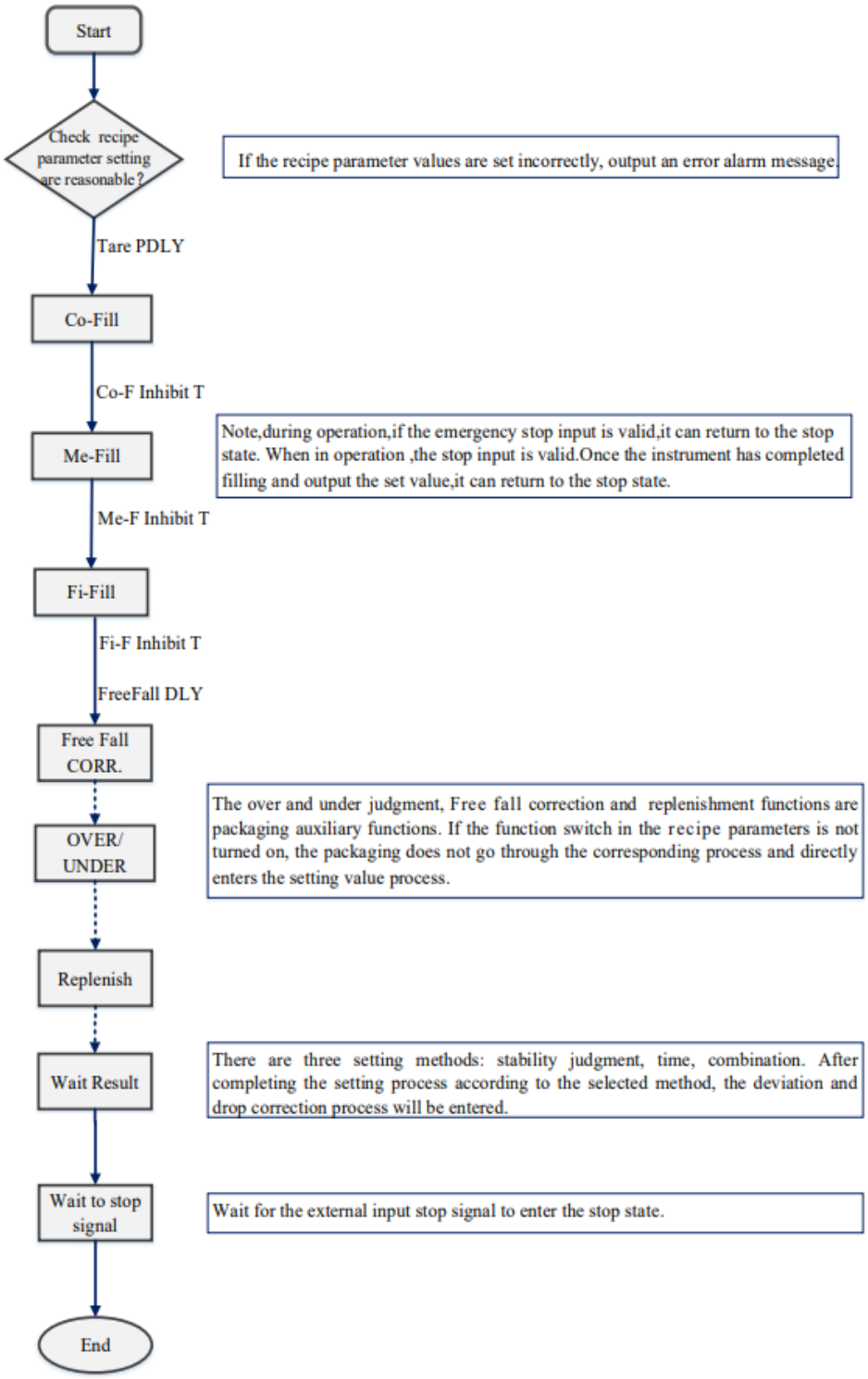
The wait result is completed and the done signal is output.

Wait for the external input stop signal to enter the stop state.

11.3 **Multi decrement**

Liquid Filling process instructions:



Chapter 12 Product Dimensions