GENERAL MEASURE

杰 • 曼 • 科 • 技

GMT-H1

User Manual

110611030004
V03.00.08

 Warning	The product adopts AC220V power supply.
	Please keep the instrument well grounded.
	The product is an electrostatic sensitive device. Take anti-static measures during use and maintenance

Standards & Certification	Product standard: GB/T 7724-2008 Verification regulation: JJG 649-2016 CMC Accuracy Class 3; Guangdong 0000000048; Safety certification: CE

Content

Chapter 1 Overview

1.1 Functions and features

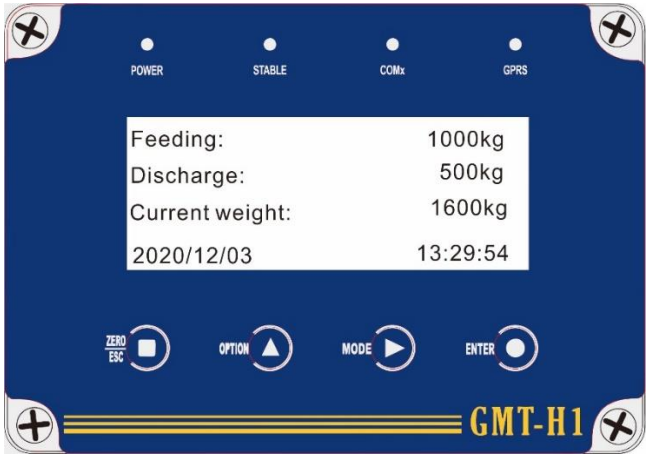
Shell type	Suspension, waterproof housing
Loadcell interface	1 channel 6-wire analog loadcell weighing platform interface, connect up to 8 350Ω loadcells at most.
Display	LCD Display Screen
Interface	1 channel 485 port (standard configuration);Supports Modbus-RTU and automatic sending protocols.
	1 RJ45 port(standard configuration);Supports Modbus-TCP and automatic sending protocols
	GPRS data transmission function
	Fixed I/O: 3 in and 3 out
	Variable IO: 3-way interface (can be customized for output/input function)
Weight calibration and calculation	Calculate the weight data by collecting the load cell, support the theoretical value calibration and weight calibration of two ways
Material level instrument function	Input scan through IO port to obtain material level information

1.2 Technical Specifications

Power supply	AC90-260 V50Hz (or 60 Hz) plus or minus 2%
Shell size	175*150*75mm
Product weight	750g
Authentication Environment	- 10 ~ 40 ℃;90% R.H without dew
Operating environment	- 20 ~ 60 ℃;90% R.H without dew
Storage environment	- 40 ~ 60 ℃;90% R.H without dew
Power consumption	10W
Excitation voltage of Weighing platform	5V 200mA(MAX)
Weighing platform requirements	1 analog platform interface, connect up to 8 350Ω loadcells, support 1mV/V, 2mV/V, 3mV/V sensitivity

Sensitivity/Certified sensitivity	0.1 uV/d, 0.5 uV/ d
Non-linearity	0.01% F.S
A/D conversion speed	Default value: 100 times/second (optional)
Maximum display accuracy	1/100000
Keys	4 key audible mechanical keys
Decimal position	0, 0.0, 0.00, 0.000; Four kinds of optional

1.3 Panel Diagram



Status Indicator Light:

POWER: Power indicator.

STABLE: Stability indicator. When the weighing platform or hopper material weight change in the stable range, the indicator light.

COMx: Communication indicator;

GPRS: GPRS communication indicator light;

Keyboard：

ZERO ESC : Zero/Esc key to exit the current operation/return to the previous menu key. Long press to zero (meet the conditions for

zeroing).

OPTION ▲: Parameters selection key. When the main display flashes, press this button to add 1 to the flashing position. If the flashing position is 9, press this button to add 1 to the data. Press this key on the main interface to enter the filling and discharging quantitative operation interface.

MODE ▶ : Parameters setting function selection key. During data input operation, the main display flashing digit flashes. Press this key to move the flashing digit to the right. If the current flashing digit is the last digit, press this key to move the flashing digit to the leftmost digit.

ENTER ●: Confirm key, confirm to enter the current option during calibration or parameters setting; Confirm the entered data and end the operation.

Main interface switch key: Power on, the default display is the incoming and outgoing material content, press ENTER ●,It can switch to display the accumulative content of material in and out on the same day.

Chapter 2 Installation and Wiring

2.1 Connecting Power cables to the controller

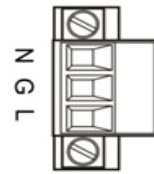
The packaging controller uses 220V, 50Hz AC power supply with protective ground. The connection is as shown below:

Power terminal diagram

L-Live line

G-Ground line

N-Neutral line



2.2 Loadcell Connection

GMT-H1 module shall be externally connected with resistance strain bridge loadcell, and the loadcell shall be connected to the module as shown below. When a four-wire loadcell is selected, the SN+ and EX+ of the module must be short-circuited, and the SN- and EX- must be short-circuited. Each port of the loadcell connection terminal is assigned to:

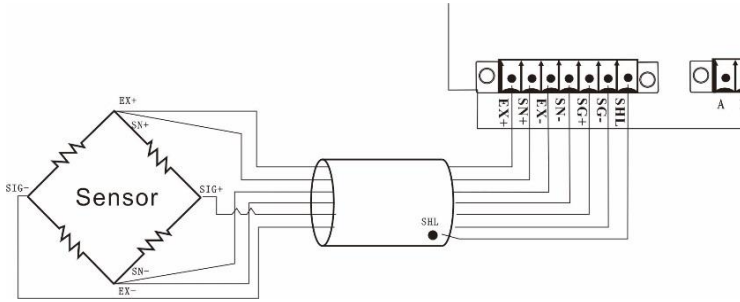
Port	**EX+**	**SN+**	**EX-**	**SN-**	**SIG+**	**SIG-**	**SHLD**
6 wire	Power positive	Loadcell positive	Power negative	loadcell negative	signal positive	Signal negative	Shielding wire
4 wire	positive		negative		signal positive	Signal negative	Shielding wire

Notice:

1.Because the loadcell output signal is more sensitive to electronic noise analog signal, so loadcell wiring should be shielded cable, and laid separately with other cables, especially away from the AC power supply;

2.For the transmission distance is short and the temperature change is not large occasions or precision requirements are not high occasions can choose the four-wire loadcell; But for the application of long transmission distance or high precision requirements should choose the six-wire loadcell;

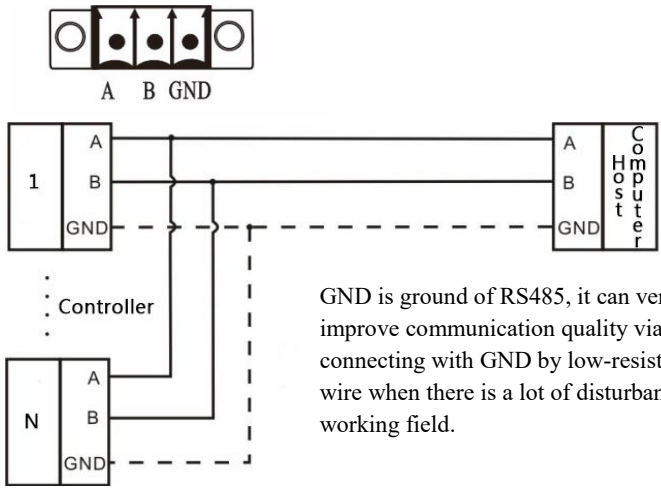
3.When multiple loadcells are connected in parallel, ensure that the sensitivity (mV/V) of each loadcell is the same.



2.3 Connection of communication Ports

The product supports one channel 485 and one channel RJ45 network port and **4G** communication, and supports Modbus-RTU/**HL Modbus-RTU**/Auto Send/ Auto Send (MAC)/YH protocol. The network port communication supports MODBUS-TCP /HL Modbus-TCP / Auto Send/ Auto Send (MAC) protocol. (see Section 9 for settings of communication parameters and communication addresses)

2.3.1 Serial port connection



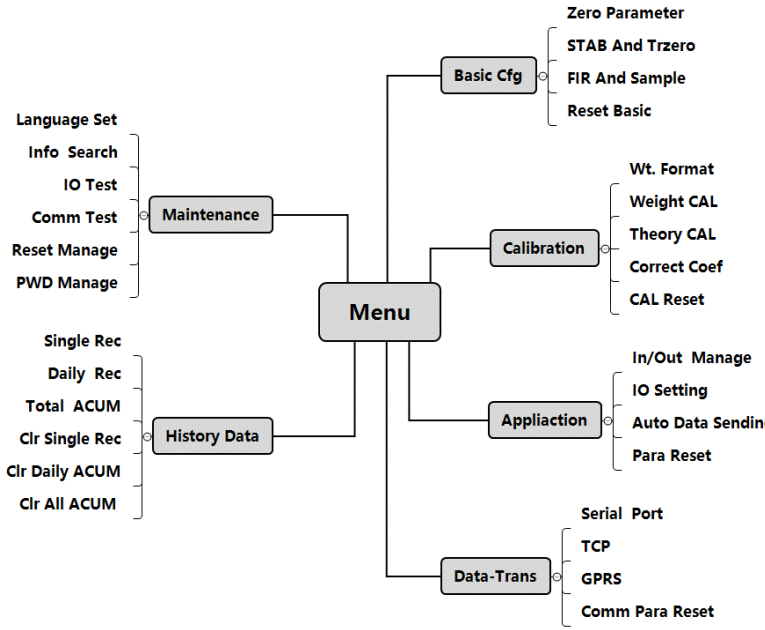
GND is ground of RS485, it can very much improve communication quality via connecting with GND by low-resistance wire when there is a lot of disturbance in working field.

2.3.2 Network port connection

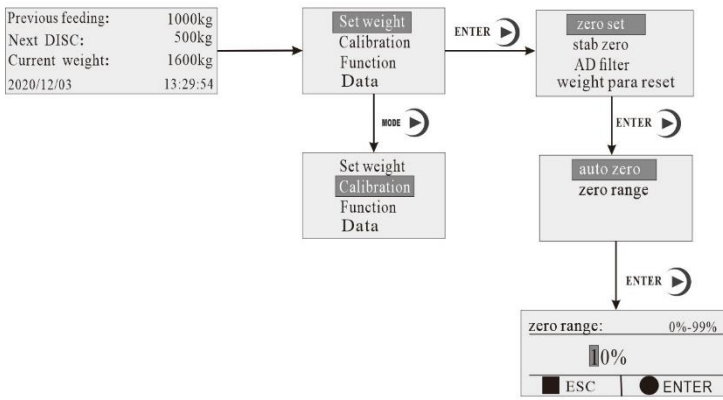
The instrument is equipped with a network communication interface, which is connected with an RJ-45 crystal head to realize communication with the host computer or PLC.

Modbus/TCP/Auto-Report/Auto-Report_MAC communication protocol is adopted. After inserting the network cable, the green indicator light of the network port slot is always on, indicating that the network cable is connected well, and the orange indicator light flashes, indicating that the network card has received network data.

Chapter 3 Menu overview



3.1 Parameters Selection and Setting



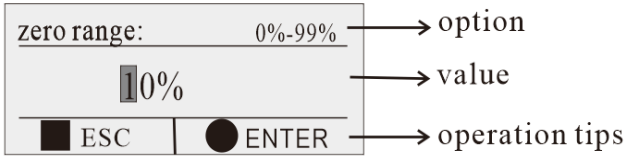
1) In the main interface, press MODE ▶ enter parameters setting interface.

2) Press OPTION ▲, MODE ▶ to switch selection parameters.

3) Press ENTER ● to complete the parameters settings.

4) Press ZERO/ESC ■ to exit.

Parameters Settings:



1) OPTION ▲, MODE ▶ **;** Switch parameters value.

Chapter 4 Setting parameters of basic Cfg

Parameters		Functional description
Zero Cfg	PWR-ON Zero	Set zero range during power-on. If the value is 0, the zero range will not be performed during power-on. Initial value: 0;Parameters Range: 0 to 99%
	Zero Range	Sets the range that zeroing is allowed. Initial value: 20%;Parameters Range: 0 to 99%
STAB And TrZero	STAB Timer	In this time, the weight change range is not greater than STAB Range, considered stable. Initial value: 1.000s;Parameters Range: 0.100 to 9.999s.
	STAB Range	During the Stable time, the weight variation range is not greater than STAB range, and it is considered stable. Initial value: 1d;The value ranges from 0 to 99d
	TrZero Time	In the set time, the weight change range is less than the Tr-Zero Range, automatic tracking zero. Initial value: 1.000s;Parameters Range: 0.100 to 9.999 seconds
	TrZero Range	When the weight change range is less than this set Tr-Zero Range, zero will be automatically tracked. Initial value: 0d;The value ranges from 0 to 99d
FIR And Sample	Digit-Filter	Digital filter, the higher the level, the stronger the filtering, but the longer the response time. Initial value:4;Parameters Range: 0 to 9
	Adv. Filter	Steady-state filter, which is enabled when the weight is in a steady state. The higher the level, the stronger the filtering, but the longer the response time. Initial value: 0;Parameters Range: 0 to 9
	Sample Rate	Sampling frequency, initial value: 100 times/s. Range: 50,60,100,120,200,240,400,480 times/s. Optional.
Basic Reset		Press ENTER(Confirm Key) to restore the factory Settings of weighing parameters.

Chapter 5 Calibration parameters

Parameters		Functional description
Wt. Format	Unit	A unit used for indicating weight. Initial value: kg Range: 0:kg/1:g/2:t/3:lb
	Decimal	The number of decimal points used for weight indication. Initial values: 0. Parameters range: 0/0.0/0.00/0.000
	Division	The smallest unit of change in weight. Initial value: 1. Parameters: 1/2/5/10/20/50/100/200/500 (d)
	Full Scale	Maximum weight that can be displayed. Initial value: 10000 Parameters range: 1~(100000* division)
Weight CAL	Auto Capture	The actual millivolt of the current loadcell is displayed
	Key In mV	Input the zero millivolt value manually for zero calibration without weight.
	CAL Weight	Perform weight calibration parameters
Theory CAL	LC mV/V	Average value of the true sensitivity of the connected loadcell, initial value: 2.0000.Range: 0.0001-5.0000 mV/V
	LC Capacity	The sum of the real range of the loadcell; Initial value: 10000 Range: 0-999999
	Use T-CAL	Choose to enable the theoretical value to calibrate and calculate the weight; Initial value: OFF. Range: ON/ OFF
Correct Coef		Used to correct the weight value, the showing weight=correction factor * weight calculated by the calibration parameters (theoretical value parameters);Initial value: 1.0000. Range: 0.00001-9.99999
CAL Reset		Press ENTER(Confirm Key) and input the

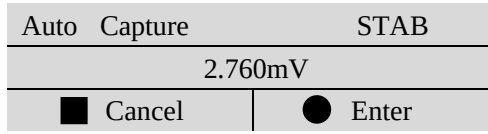
	calibration password to restore the factory Settings of the calibration parameters.

5.1 Zero Calibration

Zero calibration function can be completed by interface operation and communication port operation.

Interface operation: Weighing interface --> [Calibration] menu --> [WT. Format]

Auto Capture



Stable/Unstable: The loadcell status is only allowed in a stable state.

2.270mV: the millivolt of the current loadcell (the actual value)

■ Key---Cancel: Press ZERO ESC ■ Key to exit the automatic zero calibration interface.

● Key---Enter: Press ENTER ● Key to complete zero calibration (zero calibration operation can be completed only in a stable state. Otherwise, an alarm interface will pop up.

Note: 1) Automatic zero calibration defines the current state as zero. The platform should be emptied before execution.

2) Record "current loadcell millivolt value", so as to carry out "input zero calibration" when it is inconvenient to empty the platform.

【Key In mV】

Manually input millivolt value for weightless calibration.

5.2 CAL Weight

CAL Weight		0.027 mv
000000 kg		
■ Cancel	● Enter	STAB

Calibration steps:

1） Enter the weight calibration interface

2） Add weights to the weighing table

3） Valid until stable output

4） Enter the weight corresponding to the weight value

5） Press ENTER ● Key to complete weight calibration.

5.3 Theory CAL

The theoretical value calibration refers to the weight calibration operation through the input connection of load cell sensitivity and load cell range value.

Theoretical value calibration requires 3 steps:

1） Set load cell sensitivity (for example, connect multiple loadcells and enter the average value of sensitivity)

2） Set the total loadcell range (such as connecting multiple loadcells, input the sum of the total loadcell range)

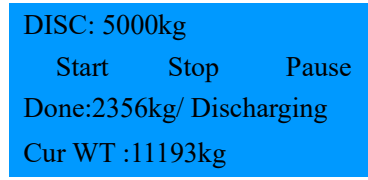
3) Turn on the "Use T-CAL" switch.

Chapter 6 Filling Function

6.1 Interface Description

Press the 

key on the main interface,Enter the quantitative operation interface, which is divided into filling operation and discharging operation. Click on the filling/discharging operation to enter the corresponding filling/discharging operation interface as follows.



6.2 Parameters Description

Parameters		Function Description
Filling Parameters	DISC Value	Quantitative discharging involves discharging materials of a specified weight. Once the discharging process is initiated and the set discharging weight is reached, the discharging stops. Initial value: 0 Range: 0-999999
	Filling Value	Quantitative feeding involves loading materials of a specified weight. Once the feeding process starts, it stops when the set feeding weight is reached. Initial value: 0 Range: 0-999999
	Done(DISC)	The weight of the material that has been cut so far after the cutting is initiated. Display the weight of the previous cutting before cutting.

	Done(Filling)	The weight of the material that has been fed so far after the feeding is started. Display the weight of the last cut before loading.
	Cur Weight	The real-time weight currently displayed.

6.3 Operating Instructions

DISC Operation:

When entering this interface, move the cursor to "Start" by pressing 

key. Press 

key to start the discharging process. If the discharging output is defined, this switch output is valid. If the cursor is moved to the "Stop" button and the 

key is pressed, the discharging will stop. After the discharging stops, the output of the discharging switch quantity will be invalid. Start discharging. If the current weight is less than the discharging weight, an alarm will be triggered. You can choose to continue or cancel. During thedischarging process, you can switch to the "Pause" button to perform the pause operation of this discharging. When the discharging is paused, the "discharging" in Progress sign changes to "Pause" in progress. Press "Start" discharging again, and then continue the blanking process from the previous pause until the blanking target quantity is completed. The current weight is equal to the weight of the discharging material. After it stabilizes, it will be included in the accumulation.

Note: If you want to directly end the current blanking process during the pause, click "Stop " operation once to end the previous blanking process.

Filling Operation:

Move the cursor to "Start "filling by pressing the 

key, then press the 

key to start the loading process. At the same time, the output of the filling IO is effective. After the feeding starts, the cursor flashes on the "Stop" button. Pressing the 

key will stop the feeding. After the feeding stops, the output of the feeding IO is invalid. When starting the feeding process, if the completed feeding exceeds the set maximum range, an alarm will prompt that the current feeding will overflow. You can choose to continue or cancel. During the feeding process, you can switch to the pause button to perform the pause operation of this feeding. When the feeding is paused, the "Filling " in Progress sign changes to "Pausing" in progress. Press the start filling button again, and then continue the filling process from the previous pause until the feeding target quantity is completed.

Note: If you want to directly end the current feeding process during the pause, click "Stop"Operation once to end the previous feeding process.

Chapter 7 Application Settings

7.1 Application Setting Parameters

Parameters		Functional description
In/Out Manage	Min In WT	When the positive weight change is greater than this value, the instrument considers that feeding operation has occurred. If 0, no judgment feeding operation is performed Initial value: 1;Range: 0-999999
	Min Out WT	When the negative weight change is greater than this value, the instrument considers that discharging operation occurs; If 0, no judgment operation will be performed Initial value: 1;Range: 0-999999
	PreDelay of In/Out	In the set period of time, the weight does not change, it is considered that completing the material in and out. Initial value: 1.000s;Range: 0.100 to 99.999
	In/Out Stable Delay	If the weight remains unchanged within the set time period, it is considered that the feeding and discharging process is complete . Initial value: 5.000s;Range: 0.100 to 99.999
	Allow People On/Down	The up and down switch for feeding and discharging materials. When this switch is turned on, when feeding or discharging materials at a constant speed, the weight of the person on the upper or lower part of the material tank (the person has not come down) should be reduced after the feeding and discharging process is completed. It is only suitable for a single person to go up and down, and the time interval between each up and down movement is 10 seconds. Initial value:ON.
IO Setting		Set the functions of the input port, output port and free port. For specific operations, please refer to the IO instructions in Section 7.1.1.
Auto Send ON/OFF		After this function is enabled, the incoming and outgoing material frames in GPRS communication will be automatically reported. Initial value: ON; Range: ON/OFF

App Reset	Press ENTER(Confirm key) and input the calibration password to restore the factory Settings of the calibration parameters.

7.2 IO Description

The standard configuration of the instrument includes 3 input interfaces and 3 output interfaces. There are 3 input and output ports that can be defined by yourself. It can achieve up to 6 input or output channels, thereby enabling the instrument to connect with external devices.

Each input and output port can be set by oneself. The factory definitions of the input and output ports are as follows.

Default definition:

Input		Output	
IN1	I1 Manual Filling	**OUT1**	O1 Fill
IN2	I2 Manual DISC	**OUT 2**	O2 DISC
IN3	I3 Stop	**OUT 3**	O0 None
Free Port IO: IO1 is for I4 to pause filling and discharging, and all other free ports are none.			

Input port function description

Code	Function	Description
0	**None**	If the port number is defined as 0, it indicates that this input port is undefined.
1	**Manual Filling**	This signal is valid. Proceed with the filling operation.
2	**Manual DISC**	This signal is valid and the instrument performs the discharging operation.
3	**Stop**	If this signal is valid, the instrument will stop the loading and unloading state.

4	**Pause**	If this signal is valid, the instrument will pause loading and unloading. Re-input to start loading and unloading.

Output port function description

Code	Function	Description
0	**None**	If the port number is defined as 0, it indicates that this input port is undefined.
1	**Fill**	When loading materials, this signal output is valid.
2	**DISC**	When discharging materials, this signal output is valid.

Free Port Setting

This controller provides three freely defined interfaces, which users can define as input or output interfaces as needed.

(1) Under the free port setting parameters item, select "IN" to define the free port as an input port. You can set the corresponding input port functions. For specific definitions, please refer to the above input port function description.

(2) Click "OUT" to define the free port as an output port, and you can set the corresponding output port function. For specific definitions, please refer to the above output port function description.

※ Adaptive feeding and discharging parameters:

To cope with small flow rates of about 1 to 3 tons per hour, the weight is detected every 30 seconds without feeding or adding materials. Each time the weight increases or decreases by more than 9 for three consecutive times, the feeding and discharging parameters are automatically adjusted (the delay before feeding and discharging is changed to 0.5 seconds, the delay for checking the stability of feeding and discharging is changed to 30 seconds, and the minimum feeding and discharging weight is always 1).

7.3 History Data Parameters

Parameters	Functional description
Single Rec	Save 100 sets of single cumulative historical data.
Daily ACUM	Record the cumulative data of incoming and outgoing materials for the day.
Total ACUM	Record the total cumulative data of incoming and outgoing materials.
Clr Single Rec	Clear single record operation
Clr Daily ACUM	Clear single day cumulative operation
Clr All ACUM	Clear Total Accumulated Operations

Chapter 8 System Maintenance

Parameter		Instruction
Language Setting	Switch between Chinese and English display; initial value: Chinese; optional: 中文/English/Russian.	
Info Search	Software Version	View the compilation date and time and corresponding version information of the front and backend.
	MAC Addr.	Check the MAC address, modification is not supported.
	Date ‖ Time	Set current time and date.
IO Test	Input Test	Input/output test function. For details, please refer to Section 8.1.
	Output Test	
COM Test	Receive test	Serial communication test function, please see Section 8.2 for details.
	Send test	
Reset Manage	Basic Reset	Press the [Enter] key to restore the weighing parameter values of the instrument to the factory settings.
	CAL Reset	Press the [Enter] key to restore the instrument calibration parameter values to the factory settings.
	APP Reset	Press the [Enter] key to restore the instrument application parameter values to the factory settings.
	COM Reset	Press the [Enter] key to restore the instrument communication parameter values to the factory settings.
	Historical Data Reset	Press the [Enter] key to clear historical data such as single records, single-day accumulation, and total accumulation with one click.
	Partly Reset	Press the [Enter] key to restore all parameter values of the instrument except calibration to factory settings.
	Reset All	Press the [Enter] key to restore all parameter values of the instrument to factory settings.

	Filling Reset	Press the [Enter] key to restore the instrument filling parameter values to the factory settings.
PWD. Manage	Basic PWD. Setting	This item is used to modify the password of various parameters and whether the password protection function needs to be turned on. Turn on protection: "On/Off" is optional. Off: Users do not need to enter a password to enter the corresponding parameters. On: Users need to enter a password to enter the corresponding parameters. Password modification: Users can change the password value of the selected parameter item by themselves。
	CAL PWD. Setting	
	APP PWD. Setting	
	COM PWD. Setting	
	Sys. PWD. Setting	
APP Mode	Mode 1	In Mode 1, the initial value of the serial communication protocol is: Modbus-RTU, and the initial value of the network port communication protocol is: Modbus-TCP.
	Mode 2	Using Mode 2, the initial value of the serial port communication protocol is: HL Modbus-RTU, and the initial value of the network port communication protocol is: HL Modbus-TCP.

8.1 IO Test

This item tests the input and output ports as well as the free port to check whether the external input and output are correctly connected. IO can be tested through the communication address.

Test method：

1) Input port I1~I3 and free port IO1~IO3 test: After the external wiring is connected, when the external signal input is valid, the corresponding input definition port under the interface from□-->■ indicates that the input interface connection is correct. When the external input is valid but the interface shows no response, it indicates an abnormal connection. Check the

switch power input, wiring, etc.

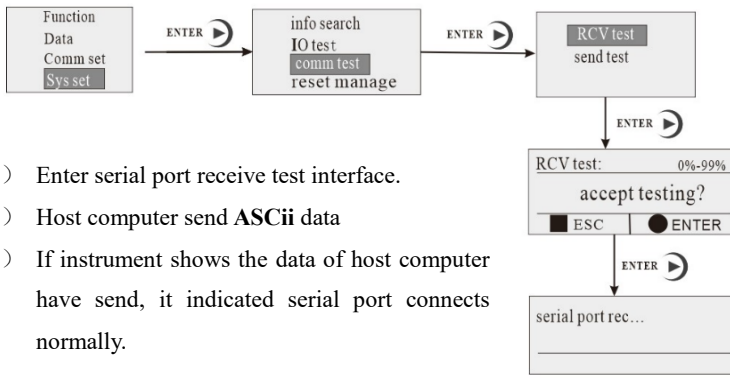
2) Output port O1~O3 and free port IO1~IO3 test: After the external wiring is connected, click the corresponding output port from □-->■. The corresponding external connection output status should be valid. If not, it indicates an abnormal connection. Check the switch power input, wiring, etc.

8.2Communication Test

The serial port test function sends and receives data in a fixed baudrate (9600) and data format (8-N-1) to test the serial port connection status.

1) Send test: send data "TEST-nnn".

2) Receiving test: externally send test data (only ASCII code) to the instrument, and display the data on the display, the length of each frame of data should not exceed 10 bytes.



1） Enter serial port receive test interface.

2） Host computer send **ASCii** data

3） If instrument shows the data of host computer have send, it indicated serial port connects normally.

Chapter 9 MODBUS communication

9.1Data -Trans Parameters

COM（RS485）	Parameters		Description
	COM ID		Slave serial number used by serial port 1.Initial value: 1. Parameters range: 1 to 247. This only works if the communication protocol has a slave number.
	Baudrate		1200, 9600,38400, 19200, 57600, 115200 are optional. Initial value: 38400bit/s
	Data format		Parameters range: 8-E-1, 8-O-1, 8-N-1, 7-E-1, 7-O-1 (data bit, parity bit, stop bit). Initial value: 8-E-1. The Modbus RTU protocol can be 8-E-1, 8-O-1, or 8-N-1.
	Protocol		Modbus_RTU/Auto Send/YH、Auto Send (MAC)/ HL Modbus_RTU. Initial value: Modbus RTU
	Dword Format		Parameters range: AB-CD, CD-AB. Initial value: AB - CD
	Send Gap		Continuous sending interval, initial value 0.000, range 0.000-9.999s
TCP	IP Addr.	Local IP address(Modbus TCP mode usage)	Initial value: 192.168.101.246; Parameters range: 0.0.0.0 to 255.255.255.255
		Target IP (Use of auto send mode)	
	Socket	Local Socket (Modbus TCP mode usage)	Initial value: 502; Parameters range: 0 to 65535
		Target Socket (Use of auto send mode)	
	Mask		Initial value: 255.255.255.000, Parameters range: 0.0.0.0 to 255.255.255.255
	Gateway		Initial value: 255.255.255.001, Parameters range: 0.0.0.0 to 255.255.255.255
	Protocol		Modbus TCP／Auto Send／Auto Send(MAC)/HL Modbus TCP. Initial value: Modbus TCP

	Dword Format	Parameters range: AB-CD, CD-AB. Initial value: AB - CD
	Send Gap	Continuous sending interval, initial value 0.000, range 0.000-9.999s
	C/S Mode	Parameter range: Server, Client. Initial value: server (Only applicable to auto send and auto send_MAC protocol) Client mode: Just set the target IP address and target socket number and it will automatically connect to the target server. Server mode: only need to set the local IP address and local socket number.
GPRS	For details, please refer to Chapter **11.1** GPRS Communication Parameters.	
COM Reset	Press the 【Enter】key to restore the communication parameter values of the instrument to the factory Settings.	

9.2 Modbus protocol

GMT-H1 Supports 1 way RS485 serial port and 1 network port. Supports Modbus-RTU(serial port), Modbus-TCP/IP(network port) communication mode and automatic sending mode. Among them, the HL Modbus protocol is a splendid customized protocol. The register address reading and writing adopt the 04 function code, and the coil address is not processed. The specific modbus address can be referred to the MODBUS Communication Address Table in Section 9.4.

9.3 MODBUS Function Code and Exception Code

◆ Function codes supported by the instrument:

Function code	Item	Instructions
03	Read register	Up to 125 single read registers
06	Write a single register	Up to 125 single read registers
16	Write multiple	This transmitter command only supports

	registers	writing to the double register. When writing, the address must be aligned. It is not allowed to write only part of the double register.
01	Read the coil	Note that this length is in bits.
05	Write the coil	

Note: this instrument only supports the above MODBUS function codes, the instrument will not respond to other function codes.

◆ **MODBUS exception code response**

Code	Item	meaning
02	Illegal data address	This error code indicates that the data address received is not allowed.
03	Illegal data value	The data written is not in the allowed range.
04	Computer	An unrecoverable error occurred while the transmitter was attempting to perform the requested operation.
07	Unsuccessful programming request	For the transmitter, the command received cannot be executed under the current conditions.

9.4 MODBUS Communication Address

Function address	PLC address	Meaning	Instructions	
The following is readable (read function code 0x03)				
0000-0001	**40001-40002**	Weight status	Sign, int	
0002	**40003**	Weight status	**D12-15**	Reserved. Return 0
			D11	Use theoretical weights
			D10	Reserved. Return 0
			D9	Reserved. Return 0
			D8	Millivolt stability (the flag for millivolt stability during calibration)
			D7	Negative loadcell overflow, lower than the allowable loadcell voltage range
			D6	The loadcell is overflow,

				exceeding the allowable loadcell voltage range
			D5	Weight negative overflow, weight less than "-(maximum range + 9d)"
			D4	Weight overflow, weight greater than "maximum range + 9d")
			D3	Overflow status, (abnormal weight or loadcell
			D2	Display weight negative sign,(display weight negative)
			D1	Zero point (weight within 0+/- 1/4 d range)
			D0	Stability (Stability sign for weight stability assessment)
0003	**40004**	Process status bit	**D15**	Feeding
			D14	Discharging
			D0-13	Reserved
0004-0011	**40005-40012**	Reserved		
0012	**40013**	Read the weight		Signed, integer (only used for HL Modbus RTU/TCP.
0013	**40014**	预留		
0014-0015	**40015-40016**	Weight Value		Display values, including signed and floating-point types
0016-0023	**40017-40024**	Reserved		
0024-0025	**40025-40026**	AD internal code after filtering		After filtering AD original code
0026-0027	**40027-40028**	Loadcell voltage		Input the voltage values of loadcell, 4 decimal points
0028-0029	**40028-40030**	Relative zero voltage		The relative of the zero voltage, 4 decimal points
0030-0039	**40031-40040**	Reserved		
0040	**40041**	Calibration Error Code	**bit12-bit15**	Read-only, returns 0
			bit11	The maximum range is too large
			bit10	The maximum range is too small

			bit9	Beyond minimum resolution
			bit8	Weight input exceeds maximum range
			bit7	Input Weight cannot be zero
			bit6	The relative zero voltage is negative
			bit5	Loadcell overflow during weight calibration
			bit4	Negative loadcell overflow during weight calibration
			bit3	Weight calibration is unstable
			bit2	Loadcell overflow during zero calibration
			bit1	Negative loadcell overflow during zero calibration
			bit0	Zero calibration is unstable
0041	**40042**	Zeroing error code	**bit6-bit15**	Read-only, returns 0
			bit5	The loadcell overflow during zeroing
			bit4	Negative loadcell overflow during zeroing
			bit3	Unstable at zeroing
			bit2	Out of range at zeroing
			bit1	unstable during power-on zeroing
			bit0	Power-on zeroing exceeds the threshold
0042-0046	**40043-40047**	Reserved		
0047	**40048**	Input status area(IN1-IN3)	bit3-bit15	Read-only, returns 0
			bit2	Input 3 status
			bit1	Input 2 status
			bit0	Input 1 state
0048	**40049**	Output status area (OUT1-OUT3)	bit3-bit15	Read-only, returns 0
			bit2	Output 3 state
			bit1	Output 2 state
			bit0	Output 1 state

0049	**40050**	Customizing I/O status area (IO1-IO3)	**bit3-bit15**	Read-only, returns 0
			bit2	Custom IO3 status;1: valid (input mode: valid, output mode: valid)
			bit1	Custom IO2 status;1: valid (input mode: valid, output mode: valid)
			bit0	Custom IO1 status;1: valid (input mode: valid, output mode: valid)
0050-0099	**40051-40100**	Reserved		
0100-0101	**40101-40102**	PWR-On Zero Range	Initial value: 0 (The power-on and reset function is disabled) Range: 0~99% (full scale percentage)	
0102-0103	**40103-40104**	Reserved		
0104-0105	**40105-40106**	Zero Range	Initial value: 20; Range:0~99%(full scale percentage)	
0106-0113	**40107-40114**	Reserved		
0114-0115	**40115-40116**	STAB Range	Initial value: 1d;Range: 0 ~ 99 d	
0116-0117	**40117-40118**	STAB Time	Initial value: 3.000;Range: 0.100 ~ 9.999s	
0118-0119	**40119-40120**	Trzero Range	Initial value: 2d;Range: 0 ~ 99 d	
0120-0121	**40121-40122**	Trzero Time	Initial value: 3.000;Range: 0.100 ~ 9.999 s	
0122-0123	**40123-40124**	Digital Filter	Initial value: 8;Range: 0 ~ 9	
0124-0125	**40125-40126**	Adv. Filter	Initial value: 8;Range: 0 ~ 9	
0126-0127	**40127-40128**	AD Sample Rate	Initial value: 2; Range: 0~7; corresponding to 50-480 times/second respectively.	
0128-0199	**40129-40200**	Reserved		
Calibration para area, the following content is readable and writable (read function code is 0x03, write function code is 0x16)				
0200-0201	**40201-40202**	Unit	Initial value: 0; Range: 0: kg, 1: g, 2: t, 3: lb	
0202-0203	**40203-40204**	Decimal point	Initial value: 0 (0); Range: 0:0; 1-0. 0; 2-0. 00; 3-0. 000	
0204-0205	**40205-40206**	Division	Initial value: 1; Range: 1/2/5/10/20/50/100/200/500 d	
0206-0207	**40207-40208**	Full Scale	Initial value: 50000;Range: 1~999999	

0208-0209	**40209-40210**	Reserved	
0210-0211	**40211-40212**	Auto Capture	Write: 1 for zero calibration Read: the current sensor millivolts
0212-0213	**40213-40214**	Key In mV	0-15000 (3 decimal points), Write: write the voltage value as the zero point voltage Reading: the mV number of the current zero point)
0214-0215	**40215-40216**	CAL Weight	Write: weight value standard gain. Read: gain millivolt value.
0216-0223	**40217-40224**	Reserved	
0224-0225	**40225-40226**	LC mV/V	Write: Sensitivity value Read: Sensitivity value set last time
0226-0227	**40227-40228**	LC Capacity	Enter the sum of all loadcell ranges
0228-0229	**40229-40230**	Use T-CAL	0: disables the function of calculating the theoretical weight 1: Using the theoretical value to calculate the weight
0230-0231	**40231-40232**	Correct Coef	Fixed 5 decimal points
0232-0299	**40233-40300**	Reserved	
Process para area, the following contents are readable (read function code is 0x03)			
0300-0301	**40301-40302**	Reserved	
0302-0303	**40303-40304**	Minimum feed weight(min in WT); Initial value: 10; Range: 0~999999	
0304-0305	**40305-40306**	Minimum discharge weight(min out WT) Initial value: 10; Range: 0~999999	
0306-0307	**40307-40308**	In/Out Stable Delay Initial value: **05.000**; Range: **0.1-99.999**	
0308-0349	**40309-40350**	Reserved	
100 pieces of historical single incoming and outgoing material data			
0350-0351	**40351-40352**	Article 1 Start time of feeding and discharging (month/year/day) The first and second bytes are years, the third byte is months, and the fourth byte is days	
0352-0353	**40353-40354**	Article 1 Start time of feeding and discharging (hour/minute/second) The first byte is 0, the second byte is hour, the third byte is minute, and the fourth byte is second	
0354-0355	**40355-40356**	Article 1 Historical weight of incoming and outgoing materials. Negative number means discharge, positive number means incoming material	
0356-0949	**40357−40358**	Article 2 Start time of feeding and discharging (year, month, day)	

		The first and second bytes are the year, the third byte is the month, and the fourth byte is the day.
0358−0359	**40359−40360**	Article2 Start time of feeding and discharging (hours, minutes and seconds) The first byte is 0, the second byte is hours, the third byte is minutes, and the fourth byte is seconds.
0360−0361	**40361−40362**	Article 2 Historical weight of incoming and outgoing materials the negative number is the output material, the positive number is the input material
0362−0949	**40363−40950**	You can read the remaining 98 groups (100 groups in total) of historical incoming and outgoing material information according to the above two sets of historical incoming and outgoing material reading sequence examples 40351-40362. When there are more than 100 pieces of data, the first piece of data will be removed. That is, up to 100 pieces of incoming and outgoing material data can be read.
60 sets of single-day input and output data		
0950-0951	**40951-40952**	Day 1 feeding time (year, month, day)
0952-0953	**40953-40954**	The cumulative weight of the incoming materials on day 1
0954-0955	**40955-40956**	The cumulative weight of the discharged material on day 1
0956-0957	**40957-40958**	Day 2 feeding time (year, month, day)
0958-0959	**40959-40960**	The cumulative weight of the incoming materials on day 2
0960-0961	**40961-40962**	The cumulative weight of the discharged material on day 2
0962-1309	**40963-41310**	You can follow the example of reading the order of incoming and outgoing materials from 40951 to 40956 above, and read the cumulative data of incoming and outgoing materials from the last 59 (total of 60 days) days.
1. 4x00951-4x00956 of PLC address is the oldest data accumulated in a day 2. If 60 pieces of data are stored, 4x01305-4x01310 of PLC address is the latest data accumulated in a day 3. If 60 records are added, the old records will be deleted and new records will be added. The second-to-last will be offset to the oldest data, which still satisfies 1,2 above		
Total cumulative weight		
1310-1311	**41311−41312**	Total feed accumulated
1312-1313	**41313−41314**	Total output accumulated
1314-1399	**41315-41400**	Reserved
IO Setting		

1400-1401	**41401-41402**	IN1 definition	0- None 1- Manual Filling 2- Manual DISC 3- STOP 4- PAUSE
1402-1403	**41403-41404**	IN2 definition	
1404-1405	**41405-41406**	IN3 definition	
1406-1407	**41407-41408**	OUT1 definition	0- None 1- Fill 2- DISC
1408-1409	**41409-41410**	OUT2 definition	
1410-1411	**41411-41412**	OUT3 definition	
1412-1413	**41413-41414**	IO1 definition	Write the corresponding function code and refer to the definition code of the input and output. (Note: Defined as an input function, write the input interface function code at the corresponding address;) Define it as an output function. Write "Output interface function code +100" at the corresponding address.
1414-1415	**41415-41416**	IO2 definition	
1416-1417	**41417-41418**	IO3 definition	
1418-1449	**41419-41450**	保留	
1450	**41451**	**IO test switch**	Test the switch, which is readable and writable. Write 1 to turn on the switch quantity test, and write 0 to turn off the switch quantity test
1451	**41452**	**IN1 Test**	Reading out 0 indicates no input, and reading out 1 indicates there is input.
1452	**41453**	**IN2 Test**	
1453	**41454**	**IN3 Test**	
1454-1459	**41455-41460**	Reserved	
1460	**41461**	**OUT1 Test**	Range: 0-1, Write: 0: Off output, 1: On output (only valid in IO test mode), read is the current IO port state, 0: off, 1: on
1461	**41462**	**OUT2 Test**	
1462	**41463**	**OUT3 Test**	
1463-1469	**41464-41470**	Reserved	
1470	**41471**	**IO1-IN1 Test**	Refer to the test parameters from IN1 ~IN3
1471	**41472**	**IO2-IN2 Test**	
1472	**41473**	**IO3-IN3 Test**	
1473-1479	**41474-41480**	Reserved	
1480	**41481**	**IO1-OUT1 Test**	Refer to the test parameters from OUT1 ~OUT3
1481	**41482**	**IO2-OUT2 Test**	

1482	**41483**	**IO3-OUT3 Test**	
1483-1507	**41484-41508**	Reserved	
Quantitative parameters, readable and writable			
1508-1509	**41509-41510**	Fill	Write 1 to start filling
1510-1511	**41511-41512**	Discharge	Write 1 to start discharging
1512-1513	**41513-41514**	Stop	Write 1 for filling and discharging
1514-1515	**41515-41516**	Pause	Write 1 to pause filling and discharing
In the serial port para area, the following contents are read/write bit status (read function code is 0x03, write function code is 0x06)			
8000	**48001**	RS485 Slave ID	Initial value:1. Range: 1 to 247
8001	**48002**	RS485 Baud rate	Initial value 0:38400 0:9600/1:19200/2:38400/3：57600/4:115200 optional
8002	**48003**	RS485 Protocol	Initial value: 0:Modbus_RTU 0: Modbus_RTU; 1: Auto Send; 2:Auto Send(MAC);3:HL Modbus_RTU
8003	**48004**	RS485 Data Format	Initial value: 0:8-E-1.Range: 0:8-E-1; 1:8-O-1; 2:8-N-1; 3: 7-E-1; 4:7-O-1 (meaning: data bit---parity bit---stop bit)
8004	**48005**	RS485 Dword Format	Initial value: AB-CD. 0: AB-CD; 1:CD-AB
8005	**48006**	RS485 comm Interval	Range: 0 ~ 9999
8006-8099	**48007-48100**	Reserved	
In the network port para area, the following contents are read/write bit status (read function code is 0x03, write function code is 0x06)			
8100	**48101**	TCP protocol	0: Modbus TCP/IP; 1: Auto Send;2:Auto Send(MAC);3:HL Modbus_TCP
8101	**48102**	Dword Format	Initial value: AB-CD. 0: AB-CD; 1:CD-AB
8102	**48103**	Network port Sending interval	Range: 0 ~ 9999

8103	**48104**	Local IP1	IP address. Initial value: 192.168.101.246 Para ranges: 0.0.0.0 - 255.255.255.255
8104	**48105**	Local IP2	
8105	**48106**	Local IP3	
8106	**48107**	Local IP4	
8107	**48108**	Target IP1	
8108	**48109**	Target IP2	
8109	**48110**	Target IP3	
8110	**48111**	Target IP4	
8111	**48112**	Loacal Network port	Initial value:502. Para range:0-65535
8112	**48113**	Destination Network port	
8113	**48114**	Network port subnet mask 1	Initial value: 255.255.255.000; Parameter range: 0.0.0.0~255.255.255.255
8114	**48115**	Network port subnet mask 2	
8115	**48116**	Network port subnet mask 3	
8116	**48117**	Network port subnet mask 4	
8117	**48118**	Network Port Gateway 1	Initial value: 192.168.000.001; Parameter range: 0.0.0.0~255.255.255.255
8118	**48119**	Network Port Gateway 2	
8119	**48120**	Network Port Gateway 3	
8120	**48121**	Network Port Gateway 4	
8121-8249.	**48122-48250.**	Reserved	
8250	**48251**	GPRS target IP1	Initial value: 192.168.101.246, Parameter range: 0.0.0.0~255.255.255.255
8251	**48252**	GPRS target IP2	
8252	**48253**	GPRS target IP3	
8253	**48254**	GPRS target IP 4	
8254	**48255**	GPRS target port	Initial value: 502; Parameter range: 0~65535
8255	**48256**	GPRS heart rate	Initial value: 30s. Range: 0-3600s
8256	**48257**	GPRS ON/OFF	0: GPRS is disabled. 1: GPRS is enabled
8257	**48258**	GPRS reactivate	Write only, 1: active
8258	**48259**	The GPRS IMEI1	read-only
8259	**48260**	The GPRS IMEI2	

8260	**48261**	The GPRS IMEI3	
8261	**48262**	The GPRS IMEI4	
8262	**48263**	The GPRS IMEI5	
8263	**48264**	The GPRS IMEI6	
8264	**48265**	The GPRS IMEI7	
8265	**48266**	The GPRS IMEI8	
8266	**48267**	The GPRS IMSI1	
8267	**48268**	The GPRS IMSI2	
8268	**48269**	The GPRS IMSI3	
8269	**48270**	The GPRS IMSI4	
8270	**48271**	The GPRS IMSI5	
8271	**48272**	The GPRS IMSI6	
8272	**48273**	The GPRS IMSI7	
8273	**48274**	The GPRS IMSI8	
8274-8799	**48275-48900**	Reserved	
Reset para area, the following contents are read/write bit state (read function code is 0x03, write function code is 0x06)			
8900	**48901**	Reset all	Reset para address area: Write 1 in the corresponding address to reset the para. For example, write 1 to address 8900 to complete the reset of all parameters
8901	**48902**	Reset all(except calibration parameters)	
8902	**48903**	Reset Calibration parameters	
8903	**48904**	Reset Basic parameters	
8904	**48905**	Reserved	
8905	**48906**	Reset Application parameters	
8906	**48907**	Rese historical parameters	
8907	**48908**	Reset serial port parameters	
8908	**48909**	Reset network port Paras	
8909	**48910**	Reset GPRS paras	
8910	**48911**	Reset all communication parameters	
8911	**48912**	Reset filling parameters	
8912-9999	**48913-410000**	Reserved	
The following is a read-only area (read function code 0x03)			
10000	**410001**	Back-end Software Version (high word)	View the product software version and compilation date address area
10001	**410002**	Back-end Software Version (low type)	
10002	**410003**	Back-end Compilation Date (high type)	
10003	**410004**	Back-end Compilation Date (low type)	
10004	**410005**	Instrument serial number 1th character	
10005	**410006**	Instrument serial number 2th character	
10006	**410007**	Instrument serial number 3th character	
10007	**410008**	Instrument serial number 4th character	

10008	**410009**	Instrument serial number 5th character	
10009	**410010**	Instrument serial number 6th character	
10010	**410011**	Instrument serial number 7th character	
10011	**410012**	Instrument serial number 8th character	
10012	**410013**	Instrument serial number 9th character	
10013	**410014**	Instrument serial number 10th character	
10014	**410015**	Instrument serial number 11th character	
10015	**410016**	Instrument serial number 12th character	
10016	**410017**	Instrument serial number 13th character	
10017	**410018**	Instrument code 01th character	
10018	**410019**	Instrument code 02th character	
10019	**410018**	Instrument code 03th character	
10020	**410021**	Instrument code 04th character	
10021	**410022**	Instrument code 05th character	
10022	**410023**	Instrument code 06th character	
10023	**410024**	Instrument code 07th character	
10024	**410025**	Instrument code 08th character	
10025	**410026**	Instrument code 09th character	
10026	**410027**	Instrument code 10th character	
10027	**410028**	Instrument code 11th character	
10028	**410029**	Instrument code 12th character	
10029	**410030**	Reserved	
10030	**410031**	Instrument model character 1	
10031	**410032**	Instrument model character 2	
10032	**410033**	Instrument model character 3	
10033	**410034**	Instrument model character 4	
10034	**410035**	Instrument model character 5	
10035	**410036**	Instrument model character 6	
10036	**410037**	Instrument model character 7	
10037	**410038**	Instrument model character 8	
10038	**410039**	Instrument model character 9	
10039	**410040**	Instrument model character 10	
10040-10099	**410041-410100**	Reserved	
10100	**410101**	Network port 0 Instrument Mac address 1, 0-255	
10101	**410102**	Network port 0 Instrument Mac address 2, 0-255	
10102	**410103**	Network port 0 Instrument Mac address 3, 0-255	
10103	**410104**	Network port 0 Instrument Mac address 4, 0-	

		255	
10104	**410105**	Network port 0 Instrument Mac address 5, 0-255	
10105	**410106**	Network port 0 Instrument Mac address 6, 0-255	
10106-10299	**410107-410300**	Reserved	
The following content is the readable and writable area (the function code for reading is 0x03)			
10106	**410107**	Custom URL characters **1，0-255**	Address 10106. Write 0 or 255. The website address will not be displayed
10107	**410108**	Custom URL characters **2，0-255**	
10108	**410109**	Custom URL characters **3，0-255**	
10109	**410110**	Custom URL characters**4，0-255**	
10110	**410111**	Custom URL characters**5，0-255**	
10111	**410112**	Custom URL characters**6，0-255**	
10112	**410113**	Custom URL characters**7，0-255**	
10113	**410114**	Custom URL characters**8，0-255**	
10114	**410115**	Custom URL characters**9，0-255**	
10115	**410116**	Custom URL characters**10，0-255**	
10116	**410117**	Custom URL characters**11，0-255**	
10117	**410118**	Custom URL characters**12，0-255**	
10118	**410119**	Custom URL characters**13，0-255**	
10119	**410120**	Custom URL characters**14，0-255**	
10120	**410121**	Custom URL characters**15，0-255**	
10121	**410122**	Custom URL characters**16，0-255**	
10122	**410123**	Custom URL characters**17，0-255**	
10123	**410124**	Custom URL characters**18，0-255**	
10124	**410125**	Custom URL characters**19，0-255**	
10125	**410126**	Custom URL characters**20，0-255**	
10126	**410127**	Custom URL characters**21，0-255**	
10127	**410128**	Custom URL characters**22，0-255**	
10128	**410129**	Custom URL characters**23，0-255**	
10129	**410130**	Custom URL characters**24，0-255**	
10130	**410131**	Custom URL characters**25，0-255**	
10131	**410132**	Custom URL characters**26，0-255**	
10132	**410133**	Custom URL characters**27，0-255**	
10133	**410134**	Custom URL characters**28，0-255**	
10134	**410135**	Custom URL characters**29，0-255**	

10135	**410136**	Custom URL characters**30，0-255**	
10136-10299	**410137-410300**	Reserved	
Function coil address, readable and writable (read function code is 0x01, write function code is 0x05)			
300	**00301**	Reset all parameters	Write 1 to perform the corresponding reset operation, and read it all as 0
301	**00302**	Reset Partly(except calibration)	
302	**00303**	Reset Calibration parameters	
303	**00304**	Reset Basic parameters	
304	**00305**	Reserved	
305	**00306**	Reset Application parameters	
306	**00307**	Reset historical parameters	
307	**00308**	Reset Serial port parameters	
308	**00309**	Reset network port parameters	
309	**00310**	Reset GPRS parameters	
310	**00311**	Reset all communication parameters	
311	**00312**	Reset quantitative parameters	
312-399	**0033-00400**	Reserved	
Coil address, readable and writable (read function code 0x01, write function code 0x05)			
400	**00401**	Input IN1	Bit read-only area, read bit each input, output port status,1:valid, 0:invalid
401	**00402**	Input IN2	
402	**00403**	Input IN3	
403	**00404**	Output OUT1	
404	**00405**	Output OUT2	
405	**00406**	Output OUT3	
406	**00407**	Customizable IO1	
407	**00408**	Customizable IO2	
408	**00409**	Customizable IO3	

Chapter 10 Automatic Sending Protocol

GMT-H1 Serial port and network port communication can be reported continuously. It can automatically upload instrument status, weight information and material information according to the set interval time. Format of automatically reporting data when there is no incoming or outgoing status.

STX	Slave ID	State	Symbol + /-	Weight	checksum	0D	0A

Among:

STX——1 byte, start character, 02H

Slave ID——3 bytes, Range：001 - 247

+/-——1 byte, +:2BH; -:2 DH.

Weight——7 bytes, including decimal point, high to 0 without decimal point

Checksum——2 bytes, checksum. Calculation: add all the preceding values and convert them to decimal, then take the last two digits and convert them to ASCII. For example, if the sum of 02 30 30 31 41 2B 20 30 30 30 30 39 35 32 39 31 0D 0A is 24F, the value is 591 in decimal notation. If the last two digits are 9 and 1 are ASCII, the value is 39 31

Status:

Status bit description								
Order	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
Define	-	-	-	-	-	1-zero	1-overflow	1-stable
describe	0	1	0	0	0	0-not zero	0-normal	0-unstable

Automatically report data format when incoming or outgoing material state

STX	Slave ID	In&Out	Start time	End Time	Weight	Checksum	0D	0A

In&Out-- 1 byte, I(In) : 49H;O(Out) : 4FH

Start/End time--12 bytes, corresponding to year, month, day, hour, minute, second.

For example, the following data is reported,

02 30 30 31 4F 32 30 31 31 32 30 31 39 35 31 33 35 32 30 31 31 32 30 31 39 35 31 35 38 20 30 30 30 37 36 37 38 33 0D 0A

The reported information is,

Slave ID: 01

State: Discharge

Start time: 19:51:35, 20th Of November, 2000

End time: 19:51:58, 20th Of November, 2000

Weight data: 767

The reported data are,

02 30 30 31 40 2B 20 30 30 33 37 35 35 39 34 0D 0A

The reported information is,

Slave ID: 01

State: current weight is positive (not in and out state)

Weight data: 3755

Chapter 11 GPRS Communication

11.1 GPRS Communication Parameters

Target IP	The IP address of the server for communication; Initial value: 192.168.101.246，Range:000.000.000.000-255.255.255.255
Target Socket	The IP port number of the server for communication; Initial value: **10081**
Heart Rate	The heartbeat packet frequency connected to the server during communication; Initial value: 60s.Range: 30-3600s
COM ON/OFF	Whether to enable GPRS communication or reactivate it; Initial value: ON;
IMEI‖IMSI	The IMEI and IMSI information of the GPRS chip cannot be modified
GPRS Status	View the current GPRS status
Signal Strength	Check the current signal strength of GPRS. 0-11: Communication is prone to disconnection. 12-18: Unstable communication 19-30: Stable communication, 31: Best signal 99: No signal

11.2 GPRS data frame structure description

Data Format	Frame header 1	Frame header 2	Frame length 1	Frame length 2	Command code	Data content	End
Sender	0xFE	0xFE	2 bytes, 6+ number of bytes of data content		0x01-0x7F	See specific protocol	0xED
Respons end	0xFE	0xFE	2 bytes, 6+ number of bytes of data content		0x80 | command code	See specific protocol	0xED

11.3 GPRS protocol

11.3.1 The heartbeat packets

Heartbeat packets	Byte No.	Instrument - > PC	Content	PC -> Instrument	The reply content
	1	0xFE			

Single Direction (no reply)	**2**	0xFE	The fixed frame header	The PC No Response	The PC No response
	3	0x00	Data frame length		
	4	0x13			
	5	0x01	The command code		
	6	Instrument MAC1	Instrument MAC address		
	7	Instrument MAC2			
	8	Instrument MAC3			
	9	Instrument MAC4			
	10	Instrument MAC5			
	11	Instrument MAC6			
	12	Weight data 1	Current weight, float type, signed data		
	13	Weight data 2			
	14	Weight data 3			
	15	Weight data 4			
	16	Material level data	The lower six bytes correspond to input 1-6		
	17	Decimal	0 to 4 represent different decimal places		

	18	Unit	0：kg，1：g，2：t，3：lb		
	19	0XED	terminator		

11.3.2 In&Out materials report frames

In&Out	Byte No.	Instrument - > PC	Report Content	PC -> Instrument	The Reply content
Two-way (with reply)	**1**	0xFE	The fixed frame head	0xFE	The fixed frame head
	2	0xFE		0xFE	
	3	0x00	Data frame length	0x00	Data frame length
	4	0x21		0x07	
	5	0x02	Command code	0x82	Return command code
	6	Instrument MAC1	Instrument MAC address	Receiving state	0x01:succeeded；0x00：failed
	7	Instrument MAC2		0XED	terminator
	8	Instrument MAC3		Note that if the data reporting is unsuccessful, it needs to be saved on the instrument end. At least 200 pieces of unreported feed or discharge data should be saved respectively and reported again until it is successful. The input and output data generated by the	
	9	Instrument MAC4			
	10	Instrument MAC5			
	11	Instrument MAC6			
	12	Year	Display in two bytes		
	13				
	14	Month	The end time of in and out materials		
	15	Day			
	16	Hour			
	17	Minute			

	18	Second		input and output events are stored in a queue and sent to the server side one by one in a first-in-first-out manner. The unsent data is backed up in the power-off memory to prevent data loss after power failure. After the instrument starts up normally, it will check whether there is any unsent historical data in the power-off memory. If there is, it will be read into the sending queue and sent one by one. If not, continue to wait for the occurrence of the feeding and discharging incident
	19	In & Out marks	0x00 In, 0x01Out	
	20	Cumulative count 1	The total cumulative number of incoming or outgoing times	
	21	Cumulative count 2		
	22	Cumulative count 3		
	23	Cumulative count 4		
	24	Weight data1	Incoming or outgoing material this time, floating-point type, signed data	
	25	Weight data2		
	26	Weight data3		
	27	Weight data4		
	28	Weight data1	Total cumulative weight value of incoming or outgoing, floating-point type, with signed data	
	29	Weight data2		
	30	Weight data3		
	31	Weight data4		
	32	Decimal	0 to 4 represent different decimal places	
	32	Unit	0：kg，1：g，2：t，3：lb	
	33	0XED	End	

11.3.3 Setting GPRS Communication Paras

GPRS	Byte No.	PC -> Instrument	Report Content	Instrument - > PC	The Reply content
Two-way	**1**	0xFE	The fixed	0xFE	

(with reply)	**2**	0xFE	frame head	0xFE	The fixed frame head
	3	0x00	Data frame length	0x00	Data frame length
	4	0x0E		0x09	
	5	0x03	The command code	0x83	Return command code
	6	Download serial Number (high 8 digits)	Download para serial number	Download serial Number (high 8 digits)	Corresponding download para serial number
	7	Download serial number (lower 8 bits)		Download serial number (lower 8 bits)	
	8	Target IP1	New target IP address	Receiving state	0x01: succeeded, 0x00:failed
	9	Target IP2		0XED	End
	10	Target IP3			
	11	Target IP4			
	12	Target port1	New destination port		
	13	Target port2			
	14	0XED	End		

11.3.4 Historical data frames

Get historical data	**Byte No.**	PC -> **Instrument**	Report Content	**Meter->PC**	**Response content description**
Two-way	**1**	0xFE	Fixed frame header	0xFE	Fixed frame header
	2	0xFE		0xFE	

(respons e)	**3**	0x00	Data frame length	Data frame length (High 8 bit)	Data frame length
	4	0x0E		Data frame length (Low8 bit)	
	5	0x04	Command code	0x84	Return command code
	6	Download serial number (High 8 bit)	Download parameter serial number	Download serial number (High 8 bit)	Correspondi ng download parameter serial number
	7	Download serial number (Low 8 bit)		Download serial number (Low 8 bit)	
	8	Year	Query the starting point of time for in&out materials	Total quantity of in&out materials	The number of in&out materials during the time period
	9	Month		Quantity of this transfer	The number of frames transmitted this time
	10	Day		The remaining amount	Remaining untransmitte d quantity of in&out materials
	11	Year	Query the end point of loading and unloading time	MAC1	Meter MAC Address
	12	Month		MAC2	
	13	Day		MAC3	
	14	0XED	End	MAC4	
	15			MAC5	
	16			MAC6	

	17		Year	In and out time
	18		Month	
	19		Day	
	20		Weight data1	The current cumulative weight value of the feed, floating point type
	21		Weight data2	
	22		Weight data3	
	23		Weight data4	
	24		Weight data1	Current discharging cumulative weight value, floating point type
	25		Weight Data2	
	26		Weight Data3	
	27		Weight Data4	
	… ….	If the queried data exceeds the maximum amount of data that can be carried by the protocol in one frame, the instrument will report the data in multiple frames until the data reporting is completed.	In&Out material data 2,3,……..N	
	N		0XED	End Character

11.3.5 SIM card information

After each successful connection of the APP, upload the IMEI number, IMSI number and SIM card number of the GPRS module of the instrument

In and Out reporting frame	**Byte sequence No.**	Instrument - > PC	**Reported content**
	1	**0xFE**	Fixed frame header
	2	**0xFE**	

Two-way (with response)	**3**	**0x00**	Data frame length
	4	**0x3E**	
	5	**0x03**	Command code
	6	Instrument **MAC1**	Instrument MAC
	7	Instrument **MAC2**	
	8	Instrument **MAC3**	
	9	Instrument **MAC4**	
	10	Instrument **MAC5**	
	11	Instrument **MAC6**	
	12	**IMEI1** of **GPRS**	IMEI number
	13	**IMEI2** of **GPRS**	
	14	**IMEI3** of **GPRS**	
	15	**IMEI4** of **GPRS**	
	16	**IMEI5** of **GPRS**	
	17	**IMEI6** of **GPRS**	
	18	**IMEI7** of **GPRS**	
	19	**IMEI8** of **GPRS**	
	20	**IMEI9** of **GPRS**	
	21	**IMEI10** of **GPRS**	
	22	**IMEI11** of **GPRS**	
	23	**IMEI12** of **GPRS**	
	24	**IMEI13** of **GPRS**	
	25	**IMEI14** of **GPRS**	
	26	**IMEI15** of **GPRS**	
	27	**IMSI1** of **GPRS**	IMSI number
	28	**IMSI2** of **GPRS**	
	29	**IMSI3** of **GPRS**	
	30	**IMSI4** of **GPRS**	
	31	**IMSI5** of **GPRS**	
	32	**IMSI6** of **GPRS**	
	33	**IMSI7** of **GPRS**	
	34	**IMSI8** of **GPRS**	

	35	**IMSI9** of **GPRS**	
	36	**IMSI10** of **GPRS**	
	37	**IMSI11** of **GPRS**	
	38	**IMSI12** of **GPRS**	
	39	**IMSI13** of **GPRS**	
	40	**IMSI14** of **GPRS**	
	41	**IMSI15** of **GPRS**	
	42	**ICCID1**	SIM card number
	43	**ICCID2**	
	44	**ICCID3**	
	45	**ICCID4**	
	46	**ICCID5**	
	47	**ICCID6**	
	48	**ICCID7**	
	49	**ICCID8**	
	50	**ICCID9**	
	51	**ICCID10**	
	52	**ICCID11**	
	53	**ICCID12**	
	54	**ICCID13**	
	55	**ICCID14**	
	56	**ICCID15**	
	57	**ICCID16**	
	58	**ICCID17**	
	59	**ICCID18**	
	60	**ICCID19**	
	61	**ICCID20**	
	62	**0XED**	End Character

11.3.6 Clear the data logging

In and Out reporting frame	**Byte sequence No.**	Instrument - > PC	**Reported content**	**Instrument -> PC**	**Response content**

Two-way (with response)	1	**0xFE**	Fixed frame header	**0xFE**	Fixed frame header
	2	**0xFE**		**0xFE**	
	3	**0x00**	Data frame length	**0x00**	Data frame length
	4	**0x0D**		**0x0D**	
	5	**0x04**	Command code	**0x84**	Return command code
	6	Instrument **MAC1**	Instrument MAC	Instrument**MAC1**	Instrument **MAC**
	7	Instrument **MAC2**		Instrument**MAC2**	
	8	Instrument **MAC3**		Instrument**MAC3**	
	9	Instrument **MAC4**		Instrument**MAC4**	
	10	Instrument **MAC5**		Instrument**MAC5**	
	11	Instrument **MAC6**		Instrument**MAC6**	
	12	**0x01**	Clear the record	Receiving status	**0x01** cleared successfully **0x00** Clearing failed
	13	**0XED**	End Character	**0XED**	End Character

Chapter 12 YH Protocol

When the serial communication protocol is selected as the YH protocol, the data frame format is automatically adjusted to 8-n-1 and the baud rate is automatically adjusted to 1200. The sending interval time is automatically adjusted to 50ms.

Under this protocol mode, data is output in ASCII code format, and each frame of data consists of a total of 9 groups (including decimal points). Data transmission starts with the lower bit and then the higher bit. There is a set of delimiters "=" between each frame of data. The transmitted data is the gross weight. For example, the current gross weight is 70.15, and continuous transmission is 51.0700=51.0700...

For example: 123.9

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	Bit8
=	9	.	3	2	1	0	0	0

Among them:

If the high bits are insufficient, add 0. The decimal point occupies 1 byte. When the number is negative, Bit8 is a negative sign "-".

Chapter 13 Automatic reporting of the MAC protocol

The product communication protocol supports the automatic reporting data format protocol with MAC address. The instrument status, MAC address, weight information and in and out material information can be automatically uploaded at set time intervals.

Automatically report the data format in the state of no entry or exit

STX	Slave ID	MAC Adddress	Status	Sign +/-	Weight	**Check Sum**	**0D**	**0A**

Among them:

STX – 1byte, start character, 02H

Slave ID - 3 bytes, range 001 to 254

MAC **address** - the last six bytes

+/- -- 1 bytes, + : 2BH; : 2DH

Weight - 7 bytes, including decimal points. The higher digit is 0 when there is no decimal point

Checksum - 2 bytes, checksum. Calculation method: Add up all the preceding values and convert to decimal, then take the last two digits and convert to ASCII code. For example, the sum of the data 02 30 30 31 39 33 44 45 42 43 41 2B 20 30 30 31 33 32 33 36 32 0D 0A is 3C2. This value is converted to decimal as 962, and the last two digits are 6 and 2, which are converted to ASCII as 36 32.

Status:

Status bit description								
Order of position	**bit7**	**bit6**	**bit5**	**bit4**	**bit3**	**bit2**	**bit1**	**bit0**
Define	Reserved	Reserved	Reserved	Reserved	Reserved	**1**-Zero	**1**-OFL	**1**-Stable
Description	Fixed**0**	Fixed**1**	Fixed**0**	Fixed**0**	Fixed**0**	**0**-Non-Zero	**0**-Normal	**0**-Unstable

In the inbound and outbound states, automatically report the data

format

STX	Slave ID	MAC Adddress	In&Out material	Start Time	End Time	Weight	Check Sum	**0D**	**0A**

In&Out material - 1 byte, I(feeding) : 49H; O(Discharge) : 4FH

Start/end time - 12 bytes, corresponding respectively to: year, month, day, hour, minute, second.

For example, the reported data is:

02 30 30 31 39 33 44 45 42 43 4F 32 30 31 31 32 30 31 39 35 31 33 35 32 30 31 31 32 30 31 39 35 31 35 38 20 30 30 30 37 36 37 36 31 0D 0A

Then the reported information is:

Slave ID: 01

Status: Discharge

Start time: 19:51:35 on November 20, 2020

End time: 19:51:58 on November 20, 2020

Weight data: 767

The reported data is:

02 30 30 31 40 2B 20 30 30 33 37 35 35 39 34 0D 0A

Then the reported information is:

Slave ID: 01

Condition: The current weight is positive (not in the state of feeding and discharging)

Weight data: 3755

Chapter 14 Product size