AD2020EB Force Value Display Controller

Instruction Manual

Before using this product, please read this instruction manual carefully. Use it correctly and store it properly after fully understanding its contents, so that you can...

Refer as needed.

- If the failure or abnormality of this product could potentially lead to a serious system accident, please install appropriate protective circuits externally.
- Do not use in locations with flammable or explosive gases, corrosive gases, dust, salt, or high concentrations of metal powder.
- Please avoid installing in locations with drastic temperature fluctuations (which may cause condensation) or in areas where heat accumulation might occur due to thermal radiation, etc.
- The instructions are subject to change without prior notice. Please refer to the latest version when consulting them. If you have any questions, please contact our company.
- Our company shall not be liable for any direct or indirect losses other than those caused by the product itself.

1.Technical Specifications

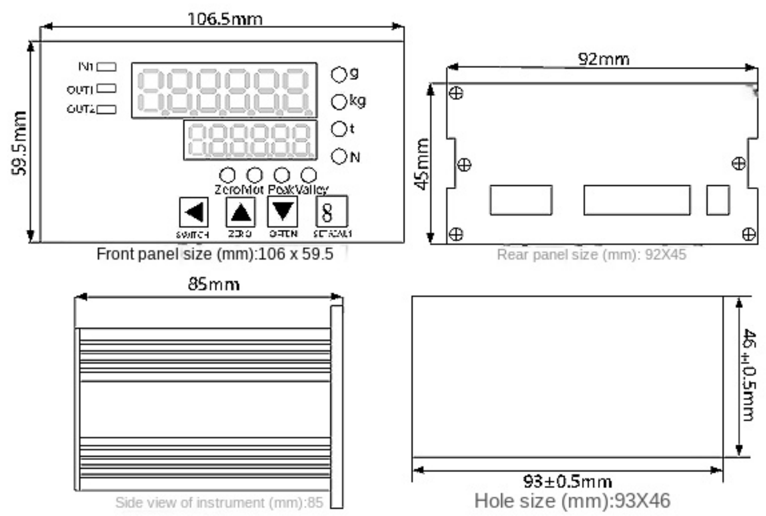
Supply voltage	DC:12V-30V
Input sensitivity	0.4mV/V~6mV/V
Display window	Double-row six-digit LED
Sensor excitation voltage	5VDC ±2%, 100mA (up to 4 sensors of 350Ω each)
A/D Performance	24 Bit, Delta-Sigma Method
Display accuracy	1/100000
Output rate	6.25/12.5/25/50/100/200/400/800/1600/3200 times/ Second
Baud rate	1200/2400/4800/9600/19200/38400/57600/115200
Operating temperature	-30℃~60℃
Withstand voltage	1 minute at 2000V AC 50/60Hz
Agreement	Modbus RTU, ASCII, and Free (Free Protocol)
Digital input/output	2 Point transistor output (max. 1A), 1-point input)
Serial port	RS485
Analog (optional)	0~20mA, 4~20mA, 0~±5V, 0~±10V; resolution 1/60000

2.Install

Warning △!

To prevent electric shock and machine malfunction, be sure to disassemble or assemble this unit only when the power is turned off.

○ External dimensions (the following drawings are for reference only; the actual product shall prevail)

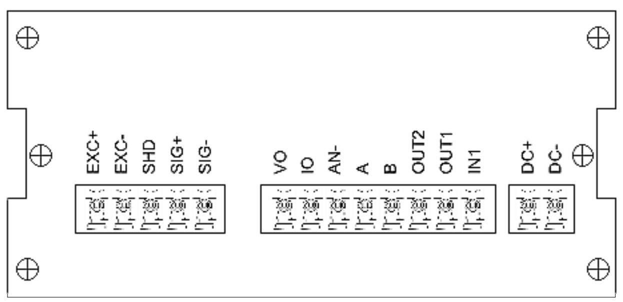


3.Wiring

Warning △!

To prevent electric shock and machine malfunction, be sure to energize the equipment only after confirming that the wiring is correct and verifying the energization range.

○ Terminal configuration (if TEDS functionality is added, the wiring terminals should be changed to a DB9 connector)



○.1 Power Wiring

Symbol	DC+	DC-
Wiring	Positive power,	negative power

○.2 Sensor Wiring (This instrument requires a resistance strain-gage bridge sensor, and the wiring method is four-wire connection.)

Compliant	EXC+	EXC-	SHD	SIG+	SIG-
Wiring	Excitation Voltage+	Excitation Voltage-	Shielding Wire	Signal+	Signal-

Note: When using a six-wire sensor, you should short-circuit the sensor's EXC+ and SIG+ terminals and then connect them to the instrument's EXC+ port.

EXC−Short-circuit to the SIG−port on the meter.

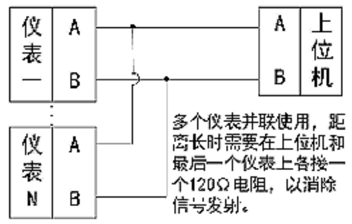
1. Since the sensor output signal is an analog signal that is highly sensitive to electronic noise, the sensor wiring should use...

Shield the cable and lay it separately from other cables, especially keeping it away from AC power sources.

2. For applications involving parallel connection of multiple sensors, it is essential to ensure that the sensitivity (mV/V) of each sensor is consistent.

○.3 Serial Port Wiring

Symbol	A	B
Wire	A	B

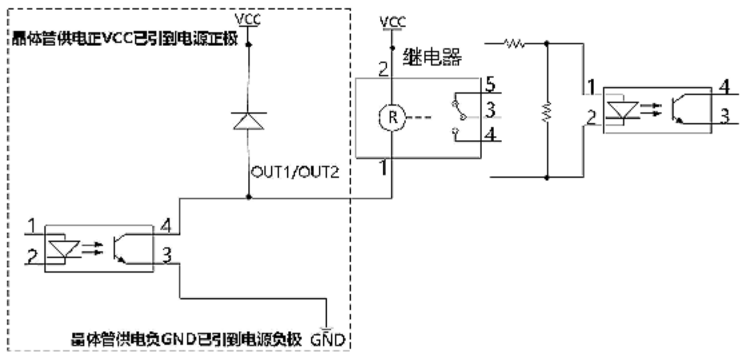


○.4 Analog Wiring

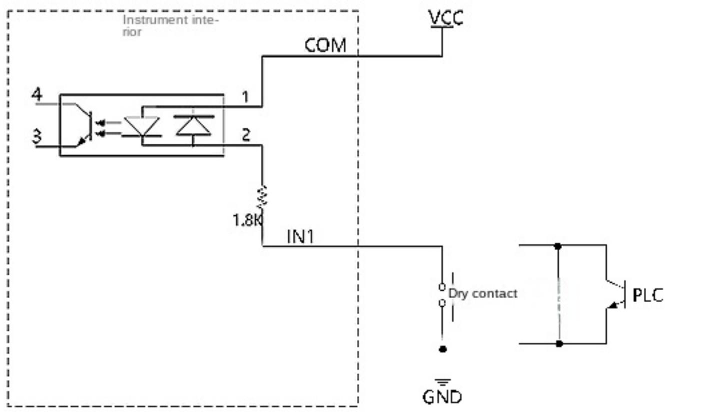
Symbol	VO	IO	AN-
Current output wiring		IO	AN-
Voltage output wiring	VO		AN-

○.5 Switching Output Wiring Diagram (The positive terminal of the internal transistor power supply has been connected to the power supply's positive terminal, and the negative terminal of the transistor power supply has been connected to...)

Negative terminal of the power supply)

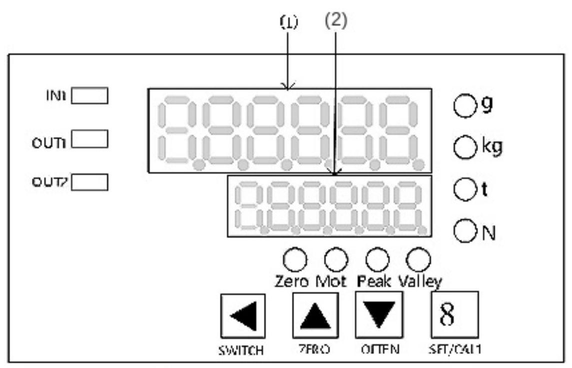


○ Digital Input Wiring Diagram



4.Basic operations

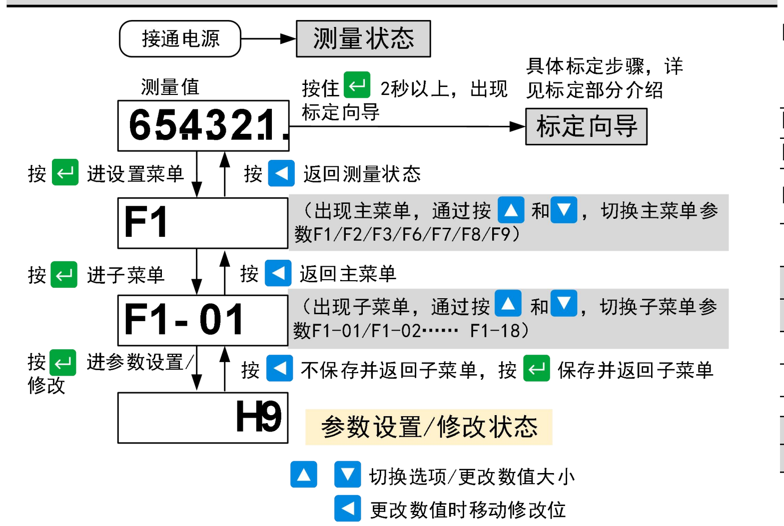
○ Panel and Button Instructions



Name	Description
Display window (1)	main interface: displays gross weight. Menu operation interface: Menu
Display Window (2)	Main Interface: Displays peak value, valley value, and peak-to-valley value. Menu operation interface: Menu content and values
Weight Indicator	g: grams; kg: kilograms; t: tons; N: newtons; All weight indicators off: Custom unit
Peak	Main interface, press ◀ Key to switch display values: Gross weight: The display window (1) always shows the gross weight. Peak: The window (2) Peak light is on.
Valley	Valley: The window (2) Valley light is on. Peak-Valley Value: The Peak and Valley lights in window (2) are on.
Mot	Light on: Current value is unstable; light off: Current value is stable.
Zero	Light on: The current weight value is 0.
IN1	Light on: Input port 1 is enabled.
OUT1	Light on: Output port 1 is enabled.
OUT2	Light on: Output port 2 is enabled.

Button	Function Description
SWITCH	Main interface: Switch window (2) displays values (peak, trough, peak-to-trough). Menu interface: Don't save and return to the previous interface. Editing interface: Move the modification position to the left when modifying numerical values.
ZERO	Main interface: Clear gross weight, clear peak and valley values. Menu interface: Scroll up the menu Edit interface: Scroll up when in selection mode / Increase the value when modifying a numeric value.
OFTEN	Main interface: Enter the frequently used menu Menu interface: Scroll down the menu Edit interface: When in selection mode, scroll down to change options/values; when modifying values, decrease the value.
SET/CALI	Main interface: Short press to enter the settings menu; press and hold for more than 2 seconds without releasing to enter the calibration menu. Menu interface: Enter the sub-level interface Edit interface: Save and return to the previous level

5.Parameter Setting Method



6.Parameter Overview

Main menu		
Name	Symbol	Content
F1	**F1**	Basic Parameters
F2	**F2**	Peak/Valley Parameter
F3	**F3**	Comparator parameters
F6	**F6**	Digital parameter
F7	**F7**	Communication parameters
F8	**F8**	Analog parameter
F9	**F9**	Other parameters

6.1 Basic Parameters

F1 Basic Parameters				
Submenu	Parameter Name	Value range	Default Value	Analysis
F1-01	Unit Selection	**Hg: kilogram; g: gram; n: newton; t: ton; nonE: Custom**	**Hg**	8.1.1
F1-02	Power-on reset range	External weight unit	000000	8.1.2
F1-03	Manual zeroing range	External weight unit	000500	8.1.3
F1-04	Stability range	0~9999, consistent with the real-time weight unit	000003	8.1.4
F1-05	Stabilization time	0.1~5.0 seconds, unit 0.1 second	0.5	8.1.4
F1-06	Zero-point range	0~99, consistent with the real-time weight unit	000003	8.1.5
F1-07	Automatic zero-tracking range	0~999.9, consistent with the real-time weight unit	00002.0	8.1.6
F1-08	Automatic zero-position tracking time	0~5.0, unit: 0.1 second	0.5	8.1.6
F1-09	Creep tracking range	0~9.999, unit: 0.001 division	0.050	8.1.7
F1-10	Creep tracking time	0~999.9, unit: 0.1 second	002.0	8.1.7
F1-11	AD conversion speed	**6.25/12.5/25/50/100/200/400/800/1600/3200 times/** Second	**12.5**	8.1.8
F1-12	Filter Type	**0 Do not use 1 Compound filtering (recommended) 2 Median filter 3: First-order filtering 4 Moving average filtering 5 Median Average Filtering 6 Median Moving Average Filtering 7 Average filtering + First-order filtering 8 Median filtering + First-order filtering 9 Sliding average filtering + first-order filtering 10 Median average filtering + first-order filtering**	**1**	8.1.9
F1-13	First-level filtering intensity	0~50	06	8.1.9
F1-14	Number of first-level filtering iterations	0~9	0	8.1.10
F1-15	Secondary filter intensity	0~9	0	8.1.10
F1-16	Stable filtering	**on: on; off: off**	**off**	8.1.10
F1-17	AD resolution	16~24 bits	24	8.1.11
F1-18	Whether negative numbers are displayed	**-1234 Display positive and negative numbers; 1234 Show only positive numbers**	**-1234**	**8.1.12**

6.2 Peak/Valley Parameters

F2 Peak/Valley Parameters				
Submenu	Parameter Name	Value range	Default value	Analysis
F2-01	Peak detection enables Can method	**nonE: Disable peak detection** **HrL: Start peak detection after the force value exceeds the peak threshold.** **EEH: Triggers upon external activation and meeting the peak threshold.** Peak detection **EEr: Start peak detection when an external signal is present (ignore threshold** Value), end peak detection when there is no external signal.	**HrL**	8.2
F2-02	Peak threshold	-99999~999,999, consistent with the real-time weight unit	000000	8.2
F2-03	Peak hysteresis	0~999,999, consistent with the real-time weight unit	000000	8.2
F2-04	Valley detection enables Can method	**nonE: Disable valley detection** **HrL: Start valley detection after the force value falls below the valley threshold.** **EEH: Triggers upon external activation and when the valley threshold is met.** Valley detection **EEr: Start valley detection when an external signal is present (ignore threshold** Value), end valley detection when there is no external signal.	**HrL**	8.2
F2-05	Minimum threshold	-99999~999,999, consistent with the real-time weight unit	000000	8.2
F2-06	Valley hysteresis	0~999,999, consistent with the real-time weight unit	000000	8.2
F2-07	Peak/Valley Detection Measure interval time	0~2.55 seconds	0.50	8.2

6.3 Comparator Parameters

F3 Comparator Parameters		
Symbol	Instructions	Analysis
F3-1	Comparator 1 parameter	8.3
F3-2	Comparator 2 parameters	8.3

Comparator N parameter (N refers to 1 or 2)				
Symbol	Parameter Name	Value range	Default value	parsing
F3-1.1	**F3-2.1 Compared to the ability to use a formula**	**nonE:Comparedtothecomparatorisclosed Por:Upelectricityimmediatelystartscomparator EEr:ExternalSignalComparator**	**Por**	
F3-1.2	**F3-2.2 Comparison Method**	**0:ForceValue≥UpperLimit 1:Withinrange≤Forcevalue≤Upperlimit 2:Lowerlimit＜Forcevalue≤Middlelimit 3:ForceValue≤LowerLimit 4:ForceValue≥UpperLimit LowerLimit＜ForceValue≤MiddleLimit 5:ForceValue≥UpperLimit ForceValue≤LowerLimit 6:Forcevalue≤lowerlimitwithinrange＜forcevalue≤upperlimit**	**0**	8.3.1
F3-1.3	**F3-2.3 Compared to data source**	**GroSS:HairWeightEAS:MeasurementValue P-v:PeakValleyValue vALLEy:ValleyValue PEAK:Peakvalue nEt:NetWeight**	**GroSS**	
F3-1.4	**F3-2.4 Compared to the duration of**	0~25.5 seconds	00.1	8.3.2
F3-1.5	**F3-2.5 Compared to the upper limit**	-99999~999999, with real-time weight unit To	099999	
F3-1.6	**F3-2.6 Compared to the limit value**	-99999~999999, with real-time weight unit To	000000	
F3-1.7	**F3-2.7 Compared to the lower limit value -99999~999999, and the actual weight unit one**	To	-09999	
F3-1.8	**F3-2.8 Compared to the criteria for judgment conditions .**	**off:Judgmentiscircumstance,always:stableweightmakeacomparativejudgment**	**off**	
F3-1.9	**F3-2.9 Comparator threshold value**	-99999~999999, with real-time weight unit To	000000	

6.4 Digital parameter

F6 Digital Input Parameters				
Submenu	Parameter Name	Value range	Default value	Analysis
F6-00	Output port test	OUT1:o1.on/o1.oFF OUT2:o2.oXn/o2.oFF	o.1oFF	8.4.1
F6-01	Output Port 1 Setting	0Communication Control 1: Zero Point 2Stable 3Overload 4: Alarm 10Comparator 1 Result 11Comparator 2 result 12Comparator 3 results 13Comparator 4 results 14Comparator 5 results 15Comparator 6 results	10	8.4.2
F6-02	Output Port 2 Settings		11	
F6-50	Enter valid time	0.01~2.55 seconds	0.05	8.4.3
F6-51	Input Port 1 Settings	0Do not use 1Zero-Cancel 2Peel it. 3Clear skin 4Start peak/valley detection 5: Clear peak/valley values 10Start comparator 1 11Enable Comparator 2 12Start comparator 3 13Start comparator 4 14Start comparator 5 15Start comparator 6	0	8.4.4

6.5 Communication Parameters

F7 Communication Parameters				
Submenu	Parameter Name	Value range	Default value	Analysis
F7-01	Protocol Type	RTU: Modbus RTU protocol FREE: Free protocol ASC: ASCII protocol	rtu	
F7-02	Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	9600	
F-03	Mailing address	1~247	001	
F7-04	Data frame format	8-n-2: 8 data bits; no parity; 2 stop bits 8-n-1: 8 data bits; no parity; 1 stop bit 8-o-1: 8 data bits; odd parity; 1 stop bit 8-E-1: 8 data bits; even parity; 1 stop bit 7-n-2: 7 data bits; no parity; 2 stop bits 7-o-1: 7 data bits; odd parity; 1 stop bit 7-E-1: 7 data bits; even parity; 1 stop bit	8-E-1	
F7-05	Response latency	0~255 milliseconds	000	
F7-06	Verification	oFF: Disable CRC check on: Enable CRC check (Modbus RTU protocol invalid)	oFF	
F7-07	High and low settings	HH-LL: The 32-bit data is first placed in the high-order bits, then in the low-order bits. LL-HH: 32-bit data is first placed in the lower bits, then the higher bits. (Only the Modbus RTU protocol is valid.	HH-LL	
F7-09	Send continuously	Modbus RTU protocol is invalid.		
F7-09	Send continuously	Modbus RTU protocol is invalid.		

F7-09 Continuous Transmission				
Submenu	Parameter Name	Value range	Default value	Analysis
F7-9.1	Continuous send switch	oFF: Disable continuous sending on: Enable continuous sending	oFF	9.1.1
F7-9.2	Continuous data source transmission	Gross: Gross weight AdC: AD value EAS: Measured value PEAk: Peak-to-valley value VALLE: Valley PEAH: Peak nEt: Net weight	Gross	9.1.1
F7-9.3	Data update method	oFF: Send regardless of whether the data has changed. on: Send only when data is updated	oFF	9.1.1
F7-9.4	Interval time	0~60,000 seconds	00.000	9.1.1
F7-9.5	Format	Std: Standard format SEP: Simple Format SEP2: Simple Format 2	Std	9.1.1

6.6 Analog Parameter

F8 Analog Parameters				
Submenu	Parameter Name	Value range	Default value	Analysis
F8-01	Analog Output Type	0-5v:0~5V 0-10v:0~10V n-5v:0~±5V n-10u:0~±10V 4-20Ë:4~20mA 0-20Ë:0~20mA	n-10u	8.5
F8-02	Analog Output Data Source	Gross: Gross weight EAS: Measured value PEAk: Peak Valley value VALLE: Valley value PEAH: Peak nEt: Net weight	Gross	8.5
F8-03	First analog quantity	-9.999~25.000	00.000	8.5
F8-04	The second analog signal	-9.999~25.000	10.000	8.5
F8-05	First point weight	-99999~999999, with real-time replay Units of measurement are consistent.	000000	8.5
F8-06	Second point weight	-99999~999999, with real-time replay Units of measurement are consistent.	010000	8.5
F8-07	Fine-tune the first analog signal.	S1 AdJ:0.001 V(mA); n1 AdJ:0.01 V(mA); L1 AdJ:0.1 V(mA)	n1 AdJ	8.5
F8-08	Fine-tune the second analog signal		n1 AdJ	8.5
F8-09	Third analog signal	-9.999~25.000	00.000	8.5
F8-10	Third point weight	-999999~999999, with real-time replay Units of measurement are consistent.	000000	8.5
F8-11	Fine-tune the third analog signal.	S1 AdJ:0.001 V(mA); n1 AdJ:0.01 V(mA); L1 AdJ:0.1 V(mA)	n1 AdJ	8.5

6.7 Other parameters

F9 Other parameters				
Submenu	Parameter Name	Value range	Default value	Analysis
F9-01	Display refresh rate	001~200 times/second	010	8.6.1
F9-02	TEDS scan	oFF: Detect TEDS sensors only when power is applied. on: Scan the TEDS sensor every 1 second (Only supported by the TEDS version)		8.6.2
F9-03	Sensor millivolt value	-39.000mV~39.000mV	Real-time data	8.6.3
F9-04	Parameter menu password	000000~999999		
F9-05	Restore default parameters	Restore all parameters from F1 to F9		8.6.4
F9-06	Version number	Firmware version number		8.6.5
F9-09	Fault notification type	oFF: No prompt onE: Prompt only once YontEr: Interval Prompt	oFF	8.6.6
F9-10	Fault notification interval	00001~34,463, unit: seconds	00010	8.6.7

7.Calibration and verification

When a user first uses this instrument, or when any part of the measurement system has changed, as well as the current calibration parameters of the device.

When the instrument fails to meet the user's requirements, it should be calibrated. Calibration can be performed using weight calibration or digital calibration (no need).

Weight calibration: The calibration can be performed by modifying any one or more of the calibration parameters.

πPress the θkey briefly or long-press the ENT key for more than 2 seconds to enter the calibration wizard. Follow the instructions in the calibration wizard to complete the calibration steps.

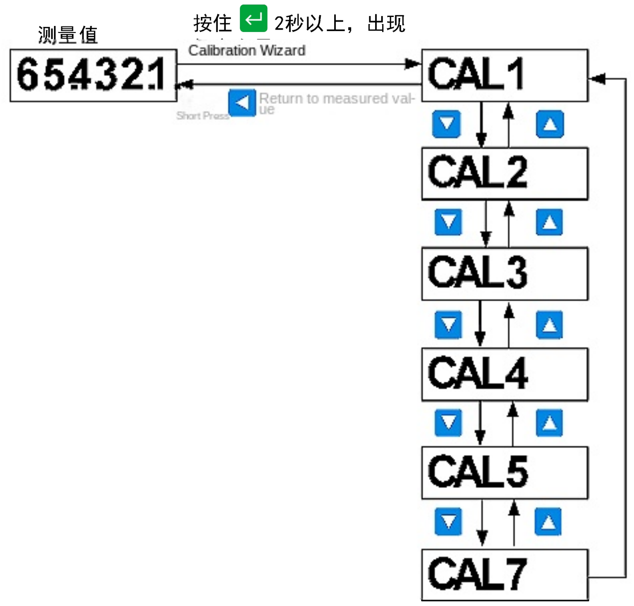
πThe instrument must be powered on for at least 15 minutes before calibration to allow the sensor and the instrument to stabilize.

Before calibrating the new equipment, the weighing body must first be pressed with a weight at full scale for at least 8 hours to stabilize its mechanical structure.

πThe angular difference must be checked before and after the device calibration.

7.1 Calibration parameters

Calibration Menu		
Name	Symbol	Content
CAL1	CAL1	Weight calibration
CAL2	CAL2	Digital calibration
CAL4	CAL4	Calibration password
CAL3	CAL3	Multi-point correction
CAL5	CAL5	Restore calibration parameters
CAL7	CAL7	Display correction parameters



7.2 Calibration Procedure

Calibration methods are divided into weighted calibration and weightless calibration (digital calibration).

πith weight calibration (CAL1): Calibrate the gain using weights

πCalibration without weights (**CAL2**): Instead of calibrating the gain, the gain is estimated based on the input sensor sensitivity.

∅When it is inconvenient to load weights on-site for system calibration, weightless calibration can be used. This applies when sensors or instruments are replaced.

Please recalibrate the scale or weighing system mechanism if there are any changes.

ith calibration weights CAL1

Calibration parameters for weights(Useweightstocalibrateandincreasebenefits)

CAL1 Weighing Calibration				
Name	Submenu	Parameter Name	Value range	Default value
unit	unite	Unit Settings	Hg: kilogram; g: gram; n: newton; t: ton; nonE: Custom	Hg
div	Dev	Degree setting	0.00010.0002, 0.0005, 0.001, 0.002, 0.0050.01, 0.02, 0.05, 0.1, 0.2, 0.51, 2, 5, 10, 20, 50	0.01
CAP	CAP	Maximum weighing value	0~999,999, consistent with the real-time weight unit	0100.00
ZEro	ZEro	Calibrate the zero point	-99999~99999, consistent with the real-time weight unit	
SPAn	SPAn	Calibration range	-99999~999,999, consistent with the real-time weight unit	

dËv(div):−−Scale setting, i.e., the smallest graduation−the minimum value that the instrument can read. (For example, a weight of 1000g, when being

When divided into 10 equal parts, the graduation value is 100 g; when divided into 100 equal parts, the graduation value is 10 g; and when divided into 1,000 equal parts...

The decimal point displayed on the digital tube is related to the scale division; if you select a scale division of 0.1, the display will show up to...

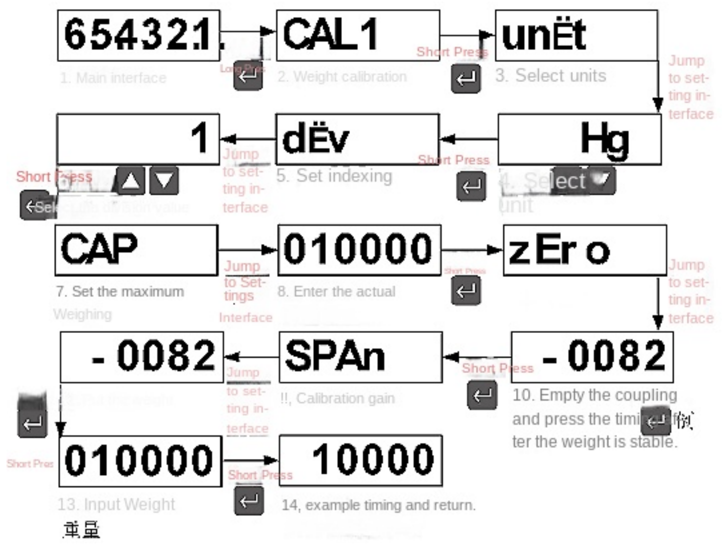
0.0If you select a graduation of 0.01, the display will show up to 0.00.

CAP(CAP):−−Maximum measurable value,i.e.,themaximumweightcapacityofthesensor.

ZERO(Zero):−−ZeroPointCalibration,thatistheweightofthesensorwhenit'sempty.

SPAn(Span):−−Gain calibration, i.e., the weight value input after loading weights onto the sensor (it is recommended to use 25% of the full scale range

The above weight).



☜. Enter weight calibration (CAL1): Press and hold 8for more than 2 seconds to enter CAL1.

☜. Unit Settings (unËt): CAL1 Short press 8to enter unËt, and you'll immediately be taken to the settings interface. Use the π key to switch units.

positions, press 8to save and switch to indexing mode.

☜. Gradation Setting (dËv): unËt Short press 8to enter dËv, and you'll immediately be taken to the setting interface. Use the π key to switch between gradations.

Value, press 8to save and switch to maximum weighing CAP.

☜. Maximum weighing (CAP): Short press 8to enter CAP, and you'll immediately jump to the settings interface. Press τto shift, and press π to modify the value

Size, press 8Save and switch to ZEro.

☜. Zero Calibration (ZEro): After setting CAP, briefly press 8to enter ZEro. Immediately afterward, a weight value will appear−this is the no-load reading.

Sensor: Short press 8 then the countdown starts for 5 seconds and switches to SPn.

☜. Gain Calibration (**SPAn**): After calibrating the zero point, immediately switch to **SPAn** and jump to a weight value; then load the weights

(Recommend sensor weight exceeding 25%), then briefly press 8and enter the weight of the loaded weights. Press τto shift, and press π to modify .

Numerical value. Press 8to save and return to the measurement value interface.

Calibration without weights

Digital calibration parameters (instead of calibrating the gain directly, the gain is estimated based on the input sensor sensitivity.)

CAL2 Digital Calibration				
Name	Submenu	Parameter Name	Value range	Default value
unit	unite	Unit Settings	Hg: kilogram; g: gram; n: newton; t: ton; nonE: Custom	
div	Dev	Degree setting	0.00010.0002, 0.0005, 0.001, 0.002, 0.0050.01, 0.02, 0.05, 0.1, 0.2, 0.51, 2, 5, 10, 20, 50	1
CAP	CAP	Maximum weighing value	0~999,999, consistent with the real-time weight unit	50000
ZEro	ZEro	Calibrate the zero point	-99999~99999, consistent with the real-time weight unit	
SEn	SEn	Calibration sensitivity	0.4000~6.000mV/V	2.000
FULL	FULL	Calibration range	-99999~999,999, consistent with the real-time weight unit	

dËv(div)−−degreesetting,whichisthesmallestgraduationthattheinstrumentcanread−thesmallestvalueitcandisplay.(Forexample1000gweight,whenitis...

When divided into 10 equal parts, the scale interval is 100g; when divided into 100 equal parts, the scale interval is 10g; when divided into 1000 equal parts, the scale interval is

At the time of division, with a resolution of 1g), the decimal point displayed on the digital tube is related to the resolution. If you select a resolution of 0.1, the display will show up to .

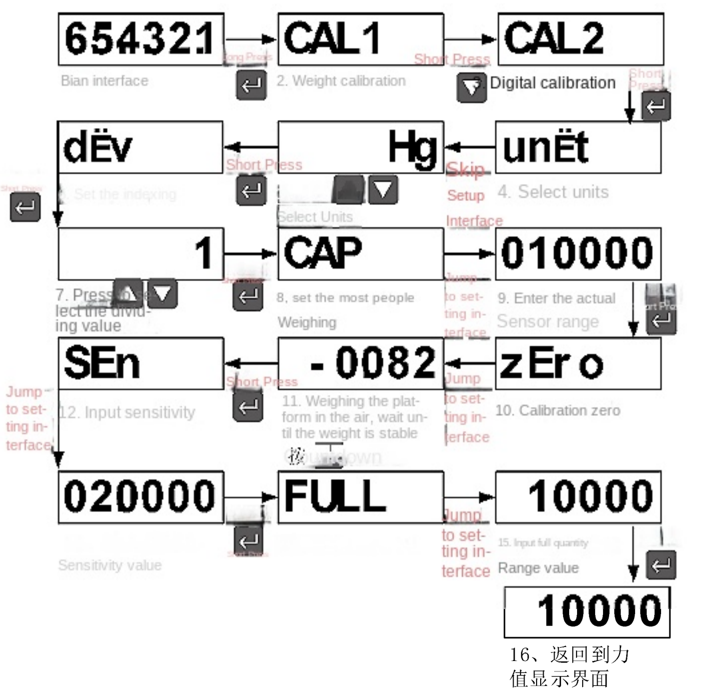
0.0If you select a graduation of 0.01, the display will show up to 0.00.

CAP(CAP)−−Maximum measurable value,whichisthemaximumweightcapacityofthesensor.

ZERO(Zero)−−ZeroPointCalibration,thatistheweightofthesensorwhenit'sempty.

SEn(SEn)−−Inputsensitivity,whichreferstothesensor'ssensitivityvalue.

FULL(FULL)−−Inputtransducermeasurementrange,thatisthetransducer'sfixedmeasurementrange.



☜. Enter weightless calibration (**CAL2**): Press and hold 8for more than 2 seconds to enter **CAL1**, then press θto enter **CAL2**.

☜. Unit Settings (**unËt**): **CAL1** Short press 8to enter **unËt** and immediately jump to the settings interface; use the π key to switch units.

Position, press 8to save and switch to the indexing setting.

☜. Scale Setting (**dËv**): **unËt** Short press 8to enter **dËv** and immediately jump to the settings interface; use the π key to switch between scales.

Value, press 8to save and switch to maximum weighing **CAP**.

☜. Maximum weighing (**CAP**): A short press of 8will immediately take you to the **CAP** setting interface. Press τto shift, and press π to modify the value.

Size, press 8to save and switch to **ZEro**.

☜. Zero Calibration (**ZEro**): After setting **CAP**, briefly press 8to enter **ZEro**. Immediately afterward, a weight value will appear−this indicates the empty-load condition

Sensor: Short press 8to start a 5-second countdown and switch to **SEn**.

☜. Set Sensitivity (**SEn**): After calibrating the zero point, briefly press 8a 5-second countdown will start, and the display will switch to **SEn**. Then, immediately jump to setting .

Set the interface and enter the sensor sensitivity.

☜. Output sensor range (**FULL**): After setting the sensitivity, briefly press 8until it reaches **FULL**, then immediately jump to the settings interface .

Enter the sensor's measurement range, then press 8to save and return to the force value display interface.

ulti-point correction

Multi-point correction (When the displayed value exhibits a non-linear relationship with the actual weight of the object on the weighing platform, data correction is required.)

Up to 10 points can be corrected.)

CAL3 Multi-point Correction				
Name	Submenu	Parameter Name	Value range	Default value
CLS	CLS	Clear multipoint correction parameters	Clear multipoint parameters	
qty	qty	Display the number of multi-point corrections	0~10 (shows multi-point edits that have been written) Positive quantity)	0
inS	YonS	Insert multi-point correction data	-99999~999999, compared with the real-time weight Unit consistent	0.00

CLS(CLS)−−Clearmultiplecorrectionsfromthedataset,thatistoremovethedatathathasalreadybeencorrected.

qty(qty)−−Displaysthenumberofpointsthathavebeenmodified,i.e.,itshowsthenumberofpointsthathavealreadybeenwrittenintothemodificationlog.

ËnS(inS)−−Insertmultipledatacorrections,whichisreferredtoasloadingweightsontotheplatformandthenenteringthecorrespondingweightvaluesforcorrection.

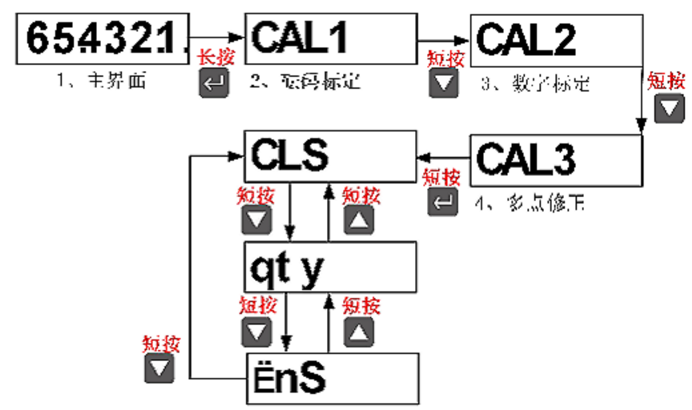


图1

图2

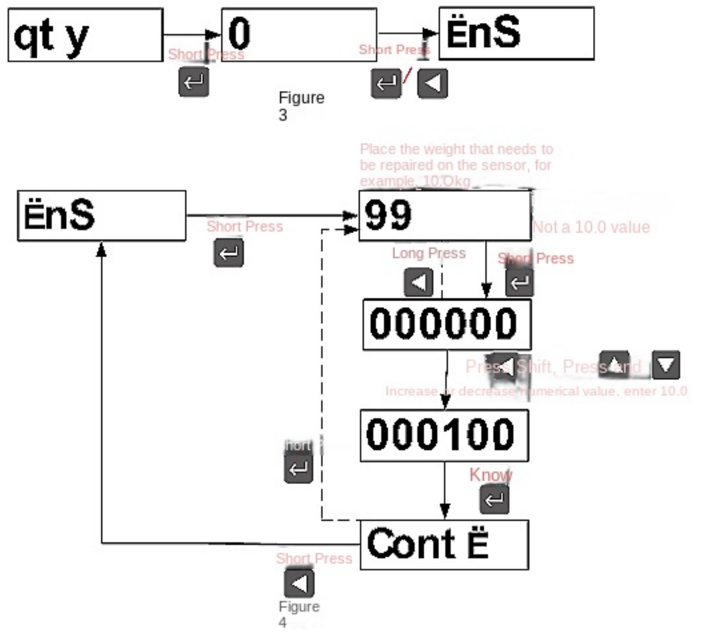


Figure 1. Entering Multi-point Correction Parameters (**CAL3**): Press and hold 8for more than 2 seconds to enter **CAL1**, then press θto enter **CAL2, then**
Press θto enter **CAL3**.

Figure 2. Clearing Multi-point Correction Parameters (**CL5**): **CAL3** Press 8to enter **CL5**, then press 8again to display **ContË**, and press 8once more to clear
Divide the data and switch to the **qty option.**

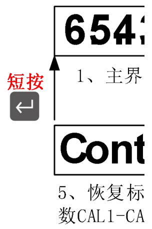
Figure 3. View the number of multi-point corrections (**qty**): **CL5** Press θto enter **qty**, then press 8to display the number of multi-point corrections; press 8or
τwitch to the **ËnS option.**

Figure 4. Inserting Multi-point Correction Data (**ËnS**): **qty** Press θto enter **ËnS**, and place the weights that need correction onto the conveyor

On the sensor, press 8to display the current weight value, then press 8again to enter edit mode. Use τto shift and π to increase or decrease the value.

Modify to the weight value you wish to display, then press 8to save and receive the prompt **ContË**–Do you want to proceed with the next correction point? When
Press τto return to **ËnS**, and press 8to enter the next correction state.

[redacted]estore calibration parameters



CAL5 Multi-point Correction				
Name	Submenu	Parameter Name	Value range	Default value
CAL5	**CLA5**	Restore calibration parameters	Restore CAL1-CAL7 parameters	

Calibration Parameter Recovery Steps: Press and hold 8for more than 2 seconds to enter **CAL1**, then press π to switch to **CAL5**, and press 8to confirm.

ContË, do you wish to continue? Press 8to restore calibration parameters and restart the module.

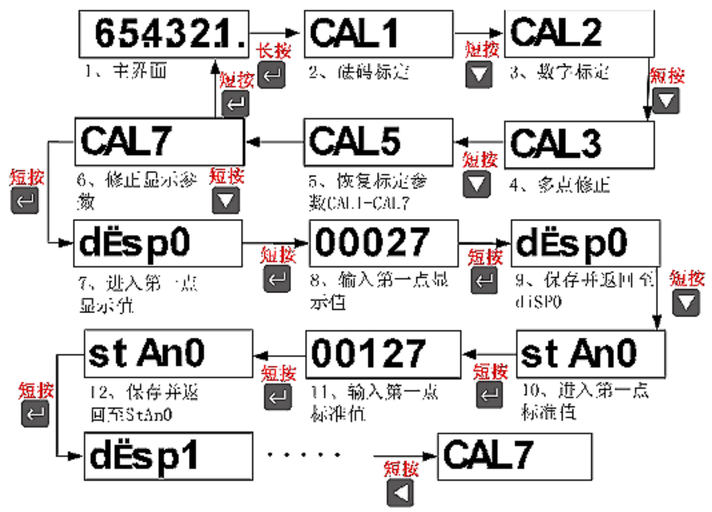
[redacted]orrect display parameters

Correct display parameters (when the input signal and display data exhibit a monotonically increasing nonlinearity, it is necessary to calibrate...) Make corrections as needed.

Monotonic increase means that as the input signal increases within its input signal range, the displayed data also increases.

CAL7 Corrected display parameters				
Name	Submenu	Parameter Name	Value range	Default value
diSP0	**dËSPO**	The first displayed value	-9999~99999, consistent with the real-time weight unit	000.00
StAn0	**StAnO**	First standard value	-9999~99999, consistent with the real-time weight unit	000.00
diSP1	**dËSP1**	Second displayed value	-9999~99999, consistent with the real-time weight unit	000.00
StAn1	**StAn1**	Second standard value	-9999~99999, consistent with the real-time weight unit	000.00
diSP2	**dËSP2**	Third point display value	-9999~99999, consistent with the real-time weight unit	000.00
StAn2	**StAn2**	Third standard value	-9999~99999, consistent with the real-time weight unit	000.00
diSP3	**dËsp3**	The fourth displayed value	-9999~99999, consistent with the real-time weight unit	000.00
StAn3	**StAn3**	Fourth standard value	-9999~99999, consistent with the real-time weight unit	000.00
diSP4	**dËSP4**	The fifth displayed value	-9999~99999, consistent with the real-time weight unit	000.00
StAn4	**StAn4**	Standard value for the fifth item	-9999~99999, consistent with the real-time weight unit	000.00
diSP5	**dËSp5**	The sixth displayed value	-9999~99999, consistent with the real-time weight unit	000.00
StAn5	**StAn5**	Sixth standard value	-9999~99999, consistent with the real-time weight unit	000.00
diSP6	**dËSp6**	The seventh digit displays a value from	-9999 to 99999, consistent with the real-time weight unit	000.00
StAn6	**StAn6**	Seventh standard value	-9999~99999, consistent with the real-time weight unit	000.00
diSP7	**dËSP7**	The eighth displayed value	-9999~99999, consistent with the real-time weight unit	000.00
StAn7	**StAn7**	Standard value for the eighth point	-9999~99999, consistent with the real-time weight unit	000.00
diSP8	**dËSP8**	Ninth point display value	-9999~99999, consistent with the real-time weight unit	000.00
StAn8	**StAn8**	Standard value for the ninth point	-9999~99999, consistent with the real-time weight unit	000.00
diSP9	**dËSP9**	Tenth point display value	-9999~99999, consistent with the real-time weight unit	000.00
StAn9	**StAn9**	Standard value for the tenth point	-9999~99999, consistent with the real-time weight unit	000.00

∅The display correction must be performed after calibration is complete.



∅he number of inflection points must be greater than 2; otherwise, there will be too few correction points, and the algorithm will not take effect.

∅In the valid data entered, the displayed value and the standard value cannot both be 0

∅After entering the quantity to be corrected, both the displayed value and the standard value for unused points will be set to 0.

Place the weights requiring correction on the sensor in ascending order, and record the displayed values at each breakpoint (placing the weights on the sensor).

The value displayed on the instrument and the standard value (the input value that needs to be corrected).

Enter the display correction parameters (**CAL7**): Press and hold the 8key for more than 2 seconds to enter **CAL1**, then press π to switch to **CAL7**.

Enter the display value at the first point (**dËSPO**): **CAL7** Press 8to enter **dËSPO**, then press 8again to enter the modification mode.

state, press τto shift, press π to adjust the value size, after entering the displayed value, press 8to save and return to dESP.

Enter the first standard value (StAnO): dËSPO Press θto enter StAnO, then press 8to enter the modification mode

State, press τto shift, press π to adjust the value magnitude. After entering the correction value, press 8to save and return to StAnO.

Enter the second point's display value (dËSP1): StAnO Press θto enter dËSP1 and fill in the corresponding display value.

After entering the displayed value and the standard value, press 8to save, then press ESC to return to CAL7.

8.Functions and Corresponding Parameter Description

[redacted].1 Basic Parameter Description (F1)

[redacted]

Options	Unit	Options	Unit	Options	Unit
Hg	kilogram kg	**t**	ton t	**nonE**	Custom unit
g	gram g	**n**	Cow N		

[redacted]

The range for automatic zeroing upon instrument power-up—directly set the weight value in the weight unit used during calibration. Execute.

When performing the power-on reset, you must be within the power-on reset range, and the weight must remain stable.

[redacted]

When the weight displayed on the scale is within the manual zeroing range, performing a manual zeroing operation will set the total weight display to zero. Power off and then power back on.

After power-on, the zero value remains unchanged. Directly set the weight value in the same unit used during calibration, and the weighing platform will then...

When the weight is within the set weight range and manual cleaning is performed, the instrument displays zero weight. When the weight is unstable...

If the set or zeroing range is exceeded, manual zeroing cannot be performed.

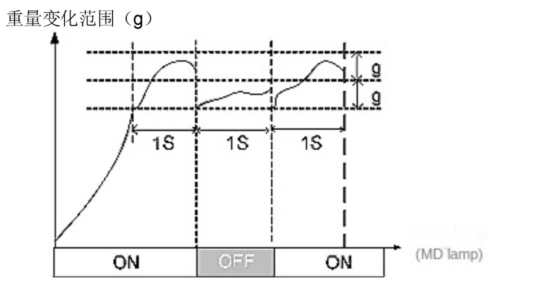
[redacted]

The MOT light on the front panel of the handheld terminal is illuminated, indicating that the weight is unstable. Under unstable weight conditions, calibration and zeroing cannot be performed.

Stability judgment includes the stability range and the stability judgment time. If the weight variation remains within the stability range throughout the stability duration, the system is considered stable once the duration expires.

Set as weight stable.

ʘssume the unit of weight is g, set the stability judgment range to 1g, and the stability judgment time to 1s. F1-04 = 1g, F1-05 = 1s



If the weight value varies by more than 1 g within 1 second, the Mot stability indicator light turns ON. When the weight value varies within 1 second...

The adjustment range is within 1 g. The Mot stability indicator light turns off (OFF), and tracking begins every 1 second.

[redacted]

When the weight value fluctuates within the zero point range, the instrument determines it to be at the zero point.

[redacted]

ʘhe automatic zero-tracking range refers to the range of values indicated by the sensor when it is unloaded or not subjected to any weight, achieved by adjusting the zero point.

The point tracking range ensures the accuracy and stability of weighing results.

ʘDuring the automatic zero-tracking period, if the weight change remains within the automatic zero-tracking range, the system will automatically track to zero once the time limit is reached.

The point makes the weight 0.

ʘThe purpose of setting the automatic zero-tracking range:

1.To improve weighing accuracy, adjusting the zero-point tracking range can eliminate potential errors inherent in the weighing equipment itself.

Such as sensor drift and mechanical wear, thereby improving the accuracy of weighing.

2.Stable weighing results—during dynamic weighing, environmental factors or fluctuations in the equipment itself may cause variations in the weighing

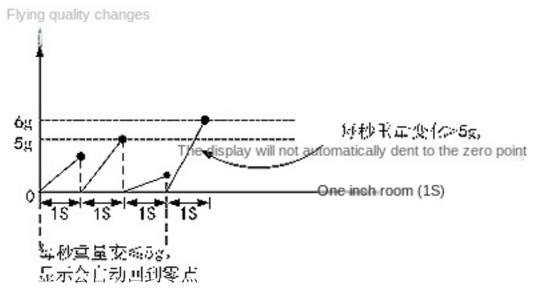
The stability of the results has declined. Adjusting the zero-point tracking range can, to a certain extent, offset these effects and ensure accurate weighing results.

Stability.

3.Easy to calibrate and maintain. By adjusting the zero-point tracking range, it's easier to determine the calibration status of the weighing device.

Promptly identify and address potential issues to ensure the equipment operates normally.

ʘAssume that the automatic zero-tracking range for F1-07 is 5g, and the automatic zero-tracking time for F1-08 is 1 seconds.



The weight value fluctuated within 1 seconds and never exceeded 5g. The displayed weight value was 0. Tracking is initiated every 1 seconds.

∅The zero-position tracking automatically turns off during calibration and reactivates after calibration is complete.

∅he set zero-tracking range must be smaller than the manual zeroing range.

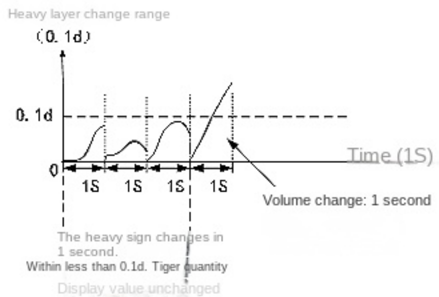
[redacted]

Creep refers to the phenomenon where, under constant environmental conditions (such as temperature and humidity), the sensor's output signal changes over time while the applied load remains unchanged.

It changes over time.

ʘssume F1-09 creep tracking range is 100, meaning 100 × 0.001 d = 0.1 d; F1-10 creep tracking time is 10 .

That is, 10 × 0.1 s = 1 s.



If the weight variation within 1 seconds is less than 0.1d, the displayed weight value remains unchanged; if the weight variation within 1 seconds exceeds

After 0.1d, the displayed value changes, and tracking is performed every 1 seconds.

∅Creep tracking is valid only when the measurement state is stable.

[redacted]

The conversion of analog signals to digital signals, often referred to as AD conversion, has the faster the conversion speed, the lower the sampling accuracy.

[redacted]1-12 Filter Type and F1-13 Filter Intensity

ʘiltering is the process of removing specific frequency bands from a signal. It's an important measure for suppressing and preventing interference. AD Sampling

After sampling, the data often contain various types of noise from different sources due to a variety of reasons. In order to obtain...

To obtain weighing data as close to reality as possible, the weighing equipment employs digital filtering for data signal processing.

Select different filter types according to the specific application scenario.

ʘThe lower the filtering intensity, the faster the response speed of the data output, but the poorer the noise suppression effect will be; whereas the filter...

The greater the wave intensity, the slower the response speed of the output signal; however, the better the noise suppression effect will be. In terms of response speed...

Make a reasonable trade-off between degree and filtering effect.

[redacted]Set the number of first-level filtering cycles / F1-15 Set the second-level filtering intensity / F1-**16** Enable the stable filtering function

ʘhe instrument features two-stage filtering: first, a primary filter is applied, followed by a secondary filter. F1-14 The setting configured is for the primary stage.

Number of filtering cycles. F1-15 Sets the filtering depth for the second-level filter. After both levels of filtering are completed, it will also determine whether is required.

To stabilize the filtering, perform another round of stabilization filtering if needed; otherwise, end the filtering process. F1-16 Set whether

Stable filtering is required.

[redacted]-17 AD Resolution

ʘD The ability to distinguish the smallest quantized signal, expressed in the number of binary digits; the higher the resolution, the more

The more sub-divisions you create within the full-scale range, the more precise the resulting measurement will be. The digital signal obtained is then converted back to using a DAC.

The closer you get after the conversion, the closer you'll be to the original simulated input value. Don't confuse resolution with accuracy—specifically, "accuracy"...

"Accuracy" is used to describe the degree of precision of a physical quantity, while "resolution" is used to describe the granularity of scale divisions.

[redacted]he F1-18 display show negative numbers?

ʘ**1234**: Displays both positive and negative numbers (default)

ʘ**234**: Only positive numbers can be displayed; when a negative signal is input, **is displayed.** 0.

[redacted].2 Peak/Valley Parameter Description (F2)

On the display value interface, you can view peak/valley values by switching the display mode. When you switch to peak display, Peak is indicated

Bright—when switching to valley display, the Valley indicator light turns on; when switching to peak-valley display, the Peak and Valley indicators turn on.

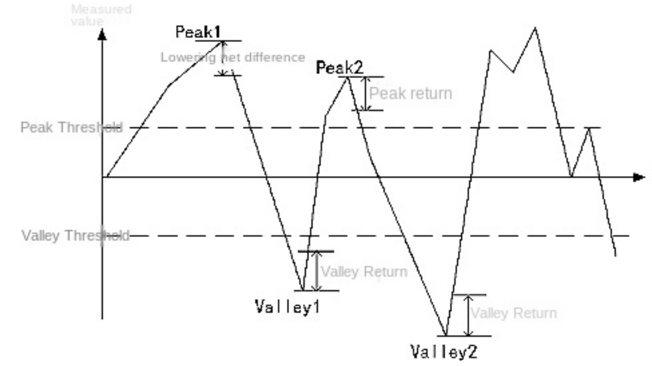
The indicator light illuminates simultaneously. When the next peak or trough value appears, the displayed data will be overwritten.

ʘPeak threshold: Peak detection is initiated when the measured value exceeds the peak threshold.

ʘeak Hysteresis: When the measured value drops back to the peak hysteresis setpoint, peak detection stops.

• Valley threshold: When the measured value falls below the valley threshold, valley detection is initiated.

ʘValley hysteresis: When the measured value returns to the valley hysteresis setpoint, valley detection stops.



As shown in the figure above, once the measured value exceeds the "peak threshold," the meter starts detecting the peak. When the measured value begins to decline, the meter...

After exceeding the "peak hysteresis," the instrument completes peak detection and obtains the peak value.

🡻fter a peak is detected, only when the measured value drops below the "peak threshold" and then rises again above the "peak threshold" ...

Only then can the peak be re-detected. To acquire the peak, the value must exceed the "peak threshold" and the subsequent drop must surpass the "peak hysteresis."

🡻Valley detection is similar to peak detection and will not be described separately.

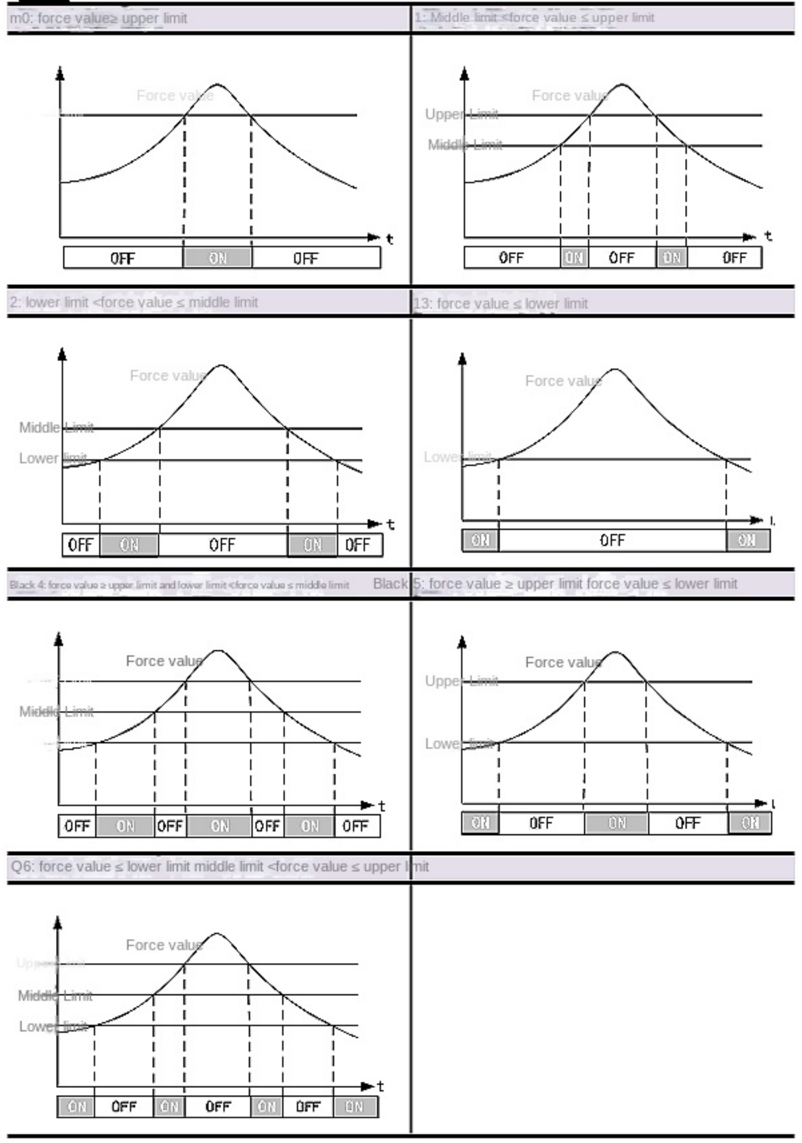
Maximum value&Minimum value detection:

To obtain the maximum measured value: Set the "Peak Threshold" according to actual needs and set the "Peak Hysteresis" to 0.

To obtain the minimum measured value: Set the "valley threshold" according to actual needs and set the "valley hysteresis" to 0.

[redacted].3 Comparator Parameter Description (F3)

[redacted]3-1.2/F3-2.2 Comparison Method (**29**)



ʘComparator 1 Setup Steps

a.F3-1.1 Turn on the comparator∅.F3-1.2 Select the comparison judgment method∅.F3-1.3 Select the comparison data source∅

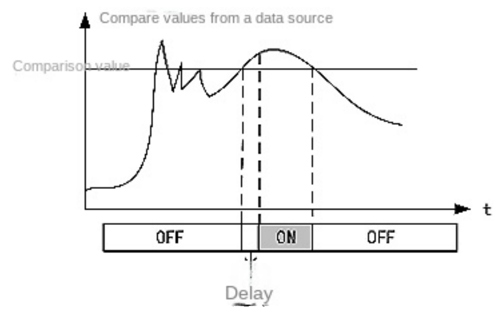
d.F3-1.4 Set comparison delay ∅.According to the comparison judgment method: F3-1.5 Set the comparison upper limit /F3-1.6 Set

Set the upper limit value in the comparator∅.F3-1.7 Set the lower limit value in the comparator∅.F3-1.8 Set the comparison criteria∅.F3-1.9

Set the comparator threshold (comparison is performed only when the force value exceeds the comparator threshold.)

ʘomparator 2 The setup steps for this comparator are identical to those for the comparator 1; therefore, they will not be described separately here.

8.3.2 F3-



8.4 Digital Input/Output Parameters (F6) 8.4.1 F6-00 Output Port Test

Enter **F6-00**, and check whether the port output is normal. When **o1.on** is displayed, the Ch1 light turns on; when **o2.on** is displayed, the CH2 light turns on.

8.4.2 F6-01 Output Port 1 Settings and F6-02 Output Port 2 Settings

Transistor output activation steps:

A: Connect the wires according to the discrete output wiring diagram.

B: Set the output conditions and output ports OUT1 corresponding to F6-01 Set the conditions, output port OUT2 corresponding to F6-02 Set

Set the condition, output port OUT3 corresponds to F6-03 Set the condition, OUT4 corresponds to F6-04 Set the condition, OUT5 corresponds to

Should F6-05 set the conditions, OUT6 corresponds to F6-06 set the conditions, OUT7 corresponds to F6-07 set the conditions. If you need to...

Compare and output the force values–please select **10~15**; comparator 1 results–comparator 6 results, refer to menu F3 and

Analysis.

8.4.3 F[redacted]

Set the hold time for the input signal; the larger the setting, the longer the input signal needs to be held, enhancing anti-interference performance.

The better the fruit, the better; the smaller the setting, the faster the response.

8.4.4 [redacted]-51/F6-52/F6-53/F6-54 Input Port 1 Settings

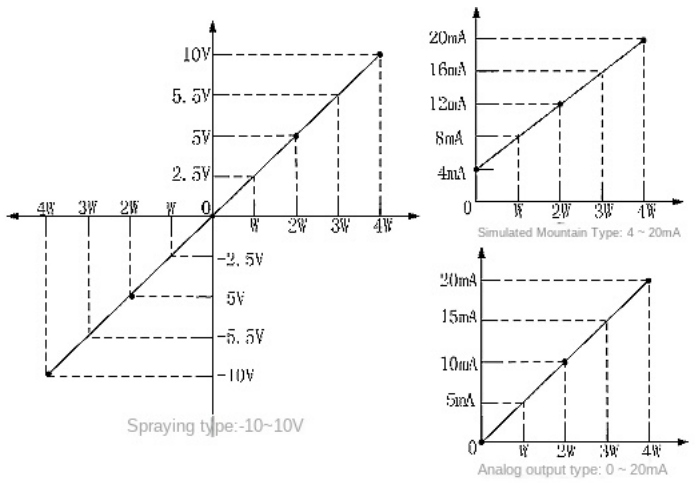
he instrument is activated by an external signal fed through the input port, enabling one of the functions selected from F6-51 to F6-54. **F6-51~F6-54**

The most commonly used function among them is external signal reset.

8.5 Analog Parameter (F8) [redacted]e instrument, if you need to output an analog signal, you must enter the F8 menu to configure the analog

Set the quantitative parameters.)

The analog output has a linear relationship with the weight value.



☜. Set the analog output type (F8-01): 0~20mA/4~20mA/0~±10V.

☜. Select the analog data source type (F8-02): Measured value / Gross weight / Net weight / Peak value / Valley value / Peak-to-valley value.

☜. Set the analog values (F8-03) and (F8-04): Set the corresponding first point according to the analog output type selected in F8-01.

Analog input and second analog input (if 0~20mA is selected: the first analog input is 0.000, and the second analog input is 20,000; If you select 4~20mA: The first analog value is 4.000, and the second analog value is 20.000; If you select Select -10~10V: The first analog value is 0.000, and the second analog value is 10.000.

☜. Set the weight values (F8-05 and F8-06): Enter 0 as the zero-point weight value in F8-05, and enter the full-scale weight value in F8-06.

☜. Fine-tune the first analog point (F8-07) and the second analog point (F8-08): When the first and second analog points...

When the output value deviates, you can make fine adjustments using F8-07 and F8-08 to ensure precise output.

☜. The third analog signal (F8-9) and the third weight (F8-10) can be optionally configured–for example, when setting a 4-20mA output

Simply set the first analog output to 4mA, and the second analog output to 20mA. If you need to set

At the three points–4mA, 12mA and 20mA–set the analog value for the first point as 4mA, and set the analog value for the second point as .

12mA, set the third analog value to 20mA. The three analog signals must be set in ascending order. the third point is set to analog.

☜. Fine-tune the third analog output (F8-11): When there is a slight deviation in the third analog output, you can fine-tune it using F8-11.

After the simulation parameters are set, don't go back to F8-01 to confirm the output type. If you do go back to F8-01 and then press Confirm,

If you press the key, the voltage or current setting parameters within F8 will revert to their default values. If you want to access F8-01, just exit .

Press the Back key when outputting; the simulated parameters–whether voltage or current–depend on the output. ±10V, ±5V, 0~10V, 0~5V,

4-20mA, 0-20mA Automatically switches; the third-point parameter is not used by default.

8.6 Other parameters (F9)

8.6.1 F9-01 Display refresh rate

Frequency of digital tube display refreshes

8.6.2 F9-02 TEDS Scan

For instruments equipped with TEDS, if the TEDS function is unavailable, the F9-02 menu will also be absent.

EDS Function: Information such as the sensor's sensitivity and measurement range is imported into the TEDS chip, and the chip is then bonded to .

On the sensor, the instrument can eliminate the need for calibration by recognizing chip data, enabling the on-site measurement system to have automatic calibration functionality.

8.6.3 F9-03 Sensor millivolt signal

ntering the F9-03 menu will display the millivolt value output by the sensor to the instrument; this millivolt value is proportional to the weight reading shown on the instrument.

The sensor's normality can be determined by the millivolt value.

8.6.4 [redacted]05 Restore default parameters (F9-05 can restore the parameters set using F1~F9 to their factory-default values.)

a.Enter F9-05 menu∅.Press 8to display **ContË**∅.Press 8to save and return to the display value interface.

(For instruments equipped with a tactile switch, press and hold the zeroing button on the instrument, then power it on. The communication parameters can be reset after 3 seconds.

To the default value)

8.6.5 F9-[redacted]

Products of the same model are distinguished by different version numbers as their functions are added, reduced, or modified.

[redacted]9-09 Fault Notification Type

In case of an error–for example, when the sensor cable is disconnected–selecting **oFF** does not trigger an error; selecting **onE** triggers an error only once; select

SelectËntEr keeps reporting an error.

[redacted]9-10 Fault notification interval

When the **Enter** selection keeps triggering an error, you need to set the interval between consecutive errors.

9.Communication parameters

9.1 Continuous Transmission Function Setting

By enabling the continuous transmission function, the meter can continuously and uninterruptedly send data to the host. Position machine.

Free protocol continuous sending settings

☜. Enter F7.101/F7.201 Select protocol type **FrEE**

☜. Go to F7.110/F7.210 and select the option to enable continuous sending on.

☜. Enter F7.111/F7.211 Select the continuous data transmission source; generally, select Gross Weight **GroSS**

☜. Enter F7.112/F7.212 Select the data update method according to customer requirements.

☜. Enter F7.113/F7.213 to select the interval for data transmission.

When setting the interval for continuous transmission, be sure to note that the set time cannot be shorter than the time required for one frame. For example:

Okay, if the set baud rate is **9600**, then the speed is **9600** bits per second. Since 1 byte **= 10** bits, the speed is **is 960** bytes per second, meaning that **1** seconds can transmit **960** bytes. If the continuously sent back format is **FE 01 50 00 00 00 00 06 CF FC CC FF**, which means that **12** bytes constitute one frame. Therefore, one frame (**12** bytes) requires

The time for is **12/960 = 0.0125** seconds **= 12.5** milliseconds. Therefore, when setting the interval for continuous transmission, we must make it sufficiently large .

At 12.5 milliseconds. Of course, you can also increase the baud rate to shorten the interval time.

☜. Go to F7.114/F7.214 and select the format for data transmission.

For example, the resolution is 0.01, and the digital tube displays 0.82. The data returned varies depending on the selected format.

Std: Standard format: FE 01 50 00 00 00 00 52 CF FC CC FF**SËP**: Simplified format: 0.82 (If the instrument does not support the ASCII protocol, select the **SËP** format; data is transmitted in ASCII

Send in HEX format to the host computer; note that the host computer must be set to display in HEX.) **SËP2**: Simple Format 2: FE 01 50 00 00 52 CF FC CC FF (data length is only 2 bytes)

9.2 Modbus RTU Protocol

Data format: 8 data bits, 1 stop bit, odd parity

8 One data bit, one stop bit, even parity

8 data bits, 1 stop bits, no parity (default)

Baud Rate: 1200, 2400, 4800**, 9600** (default), 19200, 38400, 57600, 115200, 230400 460800921,600 bps

Read register data format (read internal instrument data)

Module address	Function code	Register start address		Number of registers		CRC16 Check	
Addr	03	High 8 bit	Low 8 bit	High 8 bit	Low 8 bit	Low 8 bit	High 8 bit

2.Return format

Module address	Function code	Number of bytes	Register data		CRC16 Check	
Addr	03	N	High 8 digits	Low 8 digits	Low 8 bits	High 8 bits

Take the gross weight reading as an example

Address	Category	Description	Attribute	Default value
40081	32 position	Actual gross weight; negative numbers are represented using the standard two's complement method.	Read-only	--

The register addresses are 080 and 081 (if it's a Siemens PLC, please use register addresses 40081 and 40082), then the register starting address is 0**80** (the hexadecimal representation of 80 is **50**), and the number of registers is **2** units. Default

The module address is **01** (When connecting two or more meters in parallel, you need to set them to different module addresses– 2–so that the host computer can recognize them .

Don't). The function code for reading the register is **03**, and the CRC16 checksum is calculated based on all the preceding data 01 03 00 05 00 02. Replace

The calculated result is **C4 1A**; format the above data according to the read register transmission protocol and compile it into the following instruction: 01 03 00 50 00 02 C4 1A

Module address	Function code	Register start address		Number of registers		CRC16 Check	
01	03	00	50	00	02	C4	1A

Return the register data in the response 00 00 00 84 is the gross weight value obtained, 84 in decimal is 132.

Module Address	Function Code	Number of Bytes	Register Data–Group 1		Register Data–Group 2		CRC16 Check	
01	03	04	00	00	00	84	FA 50	

Register data 00 00 00 84 Converted to decimal is 132; if the data is FF FF FE C9, it's a negative number,FF FF F C9-FF FF FF FF = (4294966985 - 4294967295) - 1 = -311. FF FF FF FF represents -1

Write register data format (overwrite or set internal instrument data)

1.Sending format

Module Address	Function Code	Register Start Address		Number of registers		Number of bytes	Register data		CRC16 Check	
Addr	10	High 8 Bit	Low 8 Bit	High 8 Bit	Low 8 Bit	N	High 8 bit	Low 8 bit	Low 8 bit	High 8 bit

2.Return format

Module address	Function code	Register start address		Number of registers		CRC16 Check	
Addr	10	High 8 bit	Low 8 bit	High 8 bit	Low 8 bit	Low 8 bit	High 8 bit

Take setting the manual zero-range as an example.

Name	Address	Category	Description	Attribute	Default value
Zeroing Range	40094(093)	16 position Unsigned integer	Set the range for zeroing; the unit is a percentage of full scale; writing 0 The manual zero-clearing function is ineffective after writing	Just write	--

The register address is 093 (if it's a Siemens PLC, please use 40094). For one register, the register starting address is .

For 0**93**(93 in hexadecimal is **5D**), the number of registers is 1. The default module address is **01**(when connecting 2 units in parallel or using

When connecting to the instrument, you need to set it to 2 different module addresses so that the host computer can recognize them. The function code for writing to registers is **10**,

The register data assumption sets the range to 100%,100, which in hexadecimal is **64**. The CRC16 checksum is calculated based on all the preceding

Data 01 10 00 5D 00 01 02 00 64 The converted value is **AA F6**. Write the above data in register write format

The instruction is 01 10 00 5D 00 01 02 00 64 AA F6.

Module Address	Function Code	Register Start Address		Number of registers		Number of bytes	Register data	CRC16 Check	
01	10	00	5D	00	01	02	00	64 AA	F6

Return format 01 10 00 5D 00 01 90 1B

Module address	Function code	Register start address		Number of registers		CRC16 Check	
01	10	00	5D	00	01	90	1B

The following are examples of some commonly used commands; for detailed protocol information, please refer to the relevant documentation!

9.2.1 Read Modbus RTU protocol (gross weight)

Send: 01 03 00 50 00 02 C4 1A (Address 80 in hexadecimal is 50) Response: 01 03 04 00 00 00 84 FA 50 (Data varies depending on the actual situation) Register data 00 00 00 84 converted to decimal is 132. If the data is FF FF FE C9, it represents a negative number. FF FF FEC9 - FF FF FF FF = (4294966985 - 4294967295) - 1 = -311. FF FF FF FF indicates -1

9.2.2 Weight Calibration (Modbus RTU Protocol)

Calibrate the zero point (clear the weighing platform before sending the zero-point command to ensure the sensor is unloaded)

Sent: 01 10 00 24 00 04 08 7F FF FF FF 00 00 00 00 8E 7A

Reply: 01 10 00 24 00 04 81 C1

Calibration gain (place weights, filling at least 25% of the full scale or more)

Send: 01 10 00 28 00 04 08 7F FF FF FF 00 00 07 D0 9D C6 (using **2000** as an example) Send: 01 10 00 28 00 04 08 7F FF FF FF 00 00 0B B8 99 28 (using **3000** as an example) Send: 01 10 00 28 00 04 08 7F FF FF FF 00 00 13 88 93 3C (using **5000** as an example) Send: 01 10 00 28 00 04 08 7F FF FF FF 00 00 27 10 84 56 (using **10000** as an example) Response: 01 10 00 28 00 04 41 C2

9.2.3 Digital Calibration Weight Calibration(Modbus RTU Protocol)

Send: 01 10 00 2E 00 02 04 00 00 27 10 6A 07 (taking **1mV/V** as an example) Send: 01 10 00 2E 00 02 04 00 00 4E 20 44 43 (taking **2mV/V** as an example) Reply: 01 10 00 2E 00 02 21 C1

Sensor range

Send: 01 10 00 30 00 02 04 00 00 07 D0 F3 17 (using **2000** as an example) Send: 01 10 00 30 00 02 04 00 00 0B B8 F7 F9 (using **3000** as an example) Send: 01 10 00 30 00 02 04 00 00 13 88 FD ED (using **5000** as an example) Send: 01 10 00 30 00 02 04 00 00 27 10 EA 87 (using **10000** as an example) 01 10 00 30 00 02 41 C7

9.2.4 [redacted]ation Parameters(Modbus RTU Protocol)

Set the maximum weighing capacity

Send: 01 10 00 56 00 02 04 00 00 07 D0 75 15 (using **2000** as an example) Send: 01 10 00 56 00 02 04 00 00 0B B8 71 FB (using **3000** as an example) Send: 01 10 00 56 00 02 04 00 00 13 88 7B EF (using **5000** as an example) Send: 01 10 00 56 00 02 04 00 00 27 10 6C 85 (using **10000** as an example) Response: 01 10 00 56 00 02 A1 D8

Taiwan grading

Send: 01 10 00 58 00 01 02 00 00 AB 48 (using **0.001** as an example) Send: 01 10 00 58 00 01 02 00 06 2B 4A (using **0.01** as an example) Send: 01 10 00 58 00 01 02 00 09 6B 4E (using **0.1** as an example) Send: 01 10 00 58 00 01 02 00 0C AB 4D (using **1** as an example) Send: 01 10 00 58 00 01 02 00 0E 2A 8C (using **5** as an example) Response: 01 10 00 58 00 01 80 1A

[redacted]s RTU protocol)

Set the manual zeroing range

Send: 01 10 00 5D 00 01 02 00 0A 2B 1A (taking full scale **10%** as an example) Send: 01 10 00 5D 00 01 02 00 14 AB 12 (taking full scale **20%** as an example) Send: 01 10 00 5D 00 01 02 00 32 2A C8 (taking full scale **50%** as an example) Send: 01 10 00 5D 00 01 02 00 50 AB 21 (taking full scale **80%** as an example) Send: 01 10 00 5D 00 01 02 00 64 AA F6 (taking full scale **100%** as an example) Response: 01 10 00 5D 00 01 90 1BExecute manual zeroing Send: 01 10 00 5E 00 01 02 00 01 6A EE

Reply: 01 10 00 5E 00 01 60 1B

9.3 Free Protocol

Data format: **8** data bits, 1 stop bit, no parity (default

Baud Rate: 1200, 2400, 4800**, 9600** (default), 19200, 38400, 57600, 115200, 230400 460800921,600 bps

1.Sending format

Frame header	Address	Instruction	Instruction parameter		CRC Check (optional)	Frame end
FE	Addr	1 Byte	0~255 byte	high 8 bit	Low 8 bits	CF FC CC FF

2.Handshake successful response

Frame header	Address	Instruction	CRC Check (optional)		Frame end
FE	Addr	F1	High 8 digits	Low 8 digits	CF FC CC FF

Finger-grip command (default address is 1)

Name	Instruction	Instruction Argument	Instruction Description
Handshake	0x00	No module	sends 0XF1 to the host after receiving the command, indicating successful handshake. Return format: FE ADDR F1 CF FC CC FF

Transmission format: FE 01 00 CF FC CC FF

Frame header	Address	Instruction	Instruction parameters	Frame end
FE	01	00	None	CF FC CC FF

Return format: FE 01 F1 CF FC CC FF

Frame header	Address	Instruction	Frame end
FE	01	F1	CF FC CC FF

3. Write instruction response (overwrite or set internal instrument data

Frame header	Address	Instruction	Content	CRC Checksum (optional)		Frame end
FE	Addr	F2	0: Failure; 1: Success	High 8 digits	Low 8 digits	CF FC CC FF

9.3.1 [redacted]t the zeroing range (default address is 1)

Name	Instruction	Instruction parameters	Instruction Description
Set up Zero range	0x55	Channel+ ManualRange+ PowerRange	**Channel(1** bytes): Sensor channel number ; numbering starts from 0; for 0xFF Select all channels **ManualRange(1** bytes): Manually clear the range; **PowerRange(1** bytes): Power-on reset range ; Unit is expressed as a percentage of full scale; the parameter range is 0~100; if set Set to 0, then the corresponding function will be disabled

Transmission format: FE 01 55 00 32 64 CE FC CC FF(For example, the manual zeroing range is 50%, and the power-on zeroing range is

is 100%, and the hexadecimal representation of 50 is 32; the hexadecimal representation of 100 is 64. Instruction parameters: Channel number 00; Manual clear .

Zero range 32; Power-on reset range 64.)

Frame header	Address	Instruction	Instruction parameters	Frame end
FE	01	55	00 32 64	CF FC CC FF

Return format: FE 01 F2 01 CF FC CC FF (01 Success)

Frame header	Address	Instruction	Content	Frame end
FE	01	F2	01	CF FC CC FF

4. Read instruction response (read internal instrument data)

Frame header	Address	Read the corresponding instruction and its associated instruction parameter content		CRC Check (optional)		Frame end
FE	Addr	1 byte+	1~253 bytes	High 8 bit	Low 8 bit	CF FC CC FF

9.3.2 [redacted]s weight reading (default address is 1)

Name	Instruction	Instruction Argument	Instruction Description
Read Gross weight	0x50	Channel	The module returns the current gross weight value to the host; the high-order byte is sent first. **Channel(1** Bytes**):**Sensor channel number; numbering starts from 0; when set to 0xFF, Select all channels Return format: FE Addr 50 Channel Value1 Value2 Value3 Value4 CF FC CC FF

Transmission format: FE 01 50 00 CF FC CC FF (Instruction parameter 00 is the channel number

Frame header	Address	Instruction	Instruction parameters	Frame end
FE	01	50	00	CF FC CC FF

Return format: FE 01 50 00 00 00 00 46 CF FC CC FF (Corresponding instruction parameter content: Channel number 00

The weight value read out 00 00 00 46.)

Frame header, address, read the corresponding instruction, and the corresponding instruction parameter content.				Frame end
FE 01		50	00 00 00 00 46	CF FC CC FF

9.3.3 [redacted]d commands continuously (default address is 1)

Name	Instruction	Instruction Argument	Instruction Description
Continuous Send	0x07	Channel+ Enable+ DataType+ SendType+ Intervals+ Style(Optional)	**Channel(1** bytes): Sensor channel number ; numbering starts from 0; when set to 0xFF, select Select all channels **Enable(1** Byte): Enable switch ; 0x01: Continuous transmission ; 0x00: Off; **DataType(1** Byte): Data Type;00:Measured Value;01:ADInternal Code Value;02:Gross Revalue;03:Net weight value;04:Peak;05:Valley;06:Peak-to-valley difference **SendType(1** Byte):0x00: Send regardless of whether the data has changed; 0x01:Send only when data changes **Intervals(1** bytes): Continuous transmission interval time; unit ms **Style(1** bytes): Instruction format; 0x00: Standard format; 0x01: Simplified format, see Number optional

Sent: FE 01 07 00 01 02 00 32 CF FC CC FF(Corresponding instruction parameter content: Channel number **00**; Enable Switch **01**; Data type **02**; Send regardless of whether the data has changed **00**; Continuous transmission interval time 50ms, 50

32)

Frame header, address, read the corresponding instruction, and the corresponding instruction parameter content.				Frame end
FE 01		07	00 01 02 00 32	CF FC CC FF

FE 01 07 00 01 02 00 14 CF FC CC FF(Gross weight–send regardless of data changes, with an interval of 20ms)

FE 01 07 00 01 02 00 0A CF FC CC FF(Gross weight–send regardless of data changes, with an interval of 10ms)

FE 01 07 00 01 02 00 05 CF FC CC FF(Gross weight–send regardless of data changes, with an interval of 5ms)

Reply: FE 01 50 00 00 00 00 EA CF FC CC FF (The continuously occurring readings correspond to the gross weight; the instruction for gross weight is

For 50)

Frame header	Address	Read the corresponding instruction:	Corresponding instruction parameter	Frame end content
FE	01	50	00 00 00 00 EA	CF FC CC FF

9.4 ASCII Protocol

✓ Data format: 7 data bits, even parity, 1 stop bit

7 Data bits, odd parity, 1 stop bit

7 1 data bit, no parity, 2 stop bits

8 1-bit data, 1-bit stop bit, odd parity

8 1-bit data, 1-bit stop bit, even parity

8 1-bit data, 1-bit stop bit, no parity (default)

8 1-bit data, 2-bit stop bits, no parity

Baud Rate: 1200, 2400, 4800, **9600** (default), 19200, 38400, 57600, 115200, 230400 460800921,600 bps

1.Sending format

Frame header	Address	Instruction	Content	LRC Check (optional)	Frame end
:	3 Byte	1~20 bytes	0~255 bytes	2 Byte	CR LF

2.Handshake successful response

Frame header	Address	Content	LRC Check (optional)	Frame end
:	3 Byte	OK (2 bytes)	2 Byte	CR LF

Ooldhandsandgivethecommand(Entertheaddressas1)

Name	Instruction	Instruction Description
Handshake	CONNECT	The module sends OK to the host after receiving the command, indicating successful handshake. Return format: : ADDR OK CR LF

Sending format: :001CONNECT

Return format: :001OK

Frame header	Address	Content
:	001	OK

3. Write instruction response (overwrite or set internal instrument data)

Frame header	Address	Content	LRC Verification (optional)	Frame end
:	3 bytes	OK:Success;ER:Failure	2 bytes	CR LF

9.4.1 he zeroing range (the default address is 1)

Name	Instruction	Instruction Description
Set to zero Scope	ZERORANGE=Channel ,Manual,Power	**Channel: Sensor channel number; numbering starts from 0; for** 255 Select all channels at once. **Manual: Manual zeroing range;** **Power: Power-on reset range;** The unit is a percentage of the full scale; the parameter range is: 0~100; if set to 0, the corresponding function will be disabled. Can (incompatible with version 1.X protocol)

Transmission format: :001ZERORANGE=00,50,80 (Assuming the manual zeroing range is 50%, and the power-on zeroing range is 80%)

Return format: :001OK

4.Read instruction response (read internal instrument data)

Frame header	Address	Instruction	Content	LRC Check (optional)	Frame end
:	3 Byte	1~20 bytes	0~255 bytes	2 Byte	CR LF

9.4.2

Name	Instruction	Instruction Description
Read gross weight	RDGROSS=Channel	The module returns the current gross weight value to the host; **Channel: Sensor channel number; numbering starts from 0; up to 255** Time selection for all channels return format: Addr GS=Channel,VALUE CR LF (Incompatible with Protocol Version 1.X)

Sending format: :001RDGROSS =00Return format: :001GS=0.46

10. Code hint

Use the digital tube to indicate a wrong judgment.

Serial number	Compliant	Content	Reason
1	**Err01**	Power-on zeroing error	1The zero-setting range is set too small, and the weight exceeds the zeroing range.
2	**Err02**	Manual zeroing error	2.Zero the scale when the weight is unstable.
3	**Err06**	Steady yet unstable	
4	**Err20**	Data exceeds the range.	
5	**Err21**	The weight value is unreasonable.	
6	**Err22**	The weights were not placed during calibration.	Weight calibration: When calibrating the gain, no weights were placed.
7	**Err25**	Password entered incorrectly.	
8	**Err90**	Sensor failure	
9	**Err91**	AD chip failure	

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