XSQC Weighing Dynamometer Instructions
V2.1

Instructions

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Contents

Chapter 1　overview

1.1 Product introduction

Thank you for choosing our products. Before using this product, please read this manual carefully to make this product work to the maximum extent.

This product uses a 24-bit Σ-$\triangle$ ADC to convert the analogue signal of the bridge weighing sensor into a digital signal and has a 1-way switch-in and 4-way switch-out of the relay dry contact, and 1-way 4-20mA output, which not only realizes the transmission function of the weighing signal but also can output the upper and lower limit alarm.

The device adopts an AC220V power supply system.

This product also has the function of sensor line detection, that is, when the sensor is not connected or the sensor is faulty (including wire falling off, etc.), the corresponding alarm prompt is given.

Features of products:

1. It can prevent RF RFI/ electromagnetic EMI interference and has strong EMC characteristics;

2.AC220V power supply;

3. High-speed 24-bit $\sum$-$\triangle$ADC sampling, sampling over 500Hz;

4. Complete sensor fault detection functions, such as signal overrun, module sampling fault, sensor line connection fault, etc.

5. The communication interface can be equipped with 232, 485, 4-20mA, 0-10V output, etc.

1.2 Safety Tips

1. This instrument has an anti-interference design. Please make sure that the instrument is reliably grounded and separated from the AC power grounding line.

2. Do not use it in a flammable gas environment.

3. Avoid direct sunlight

1.3 The technical parameters and overall dimensions

Measuring signal	-20mV~20mV， six 350 ohms weighing sensors can be driven in parallel.
Sampling frequency	500Hz
Detection precision	III Level
Resolution	1/500000
Input and output	1-way open, effective at low level; 4-way open, relay dry contact
Communication interface	Standard 1-way 485, optional (1-way 232, 1-way current / 1-way voltage, choose only one)
Non-linearity	0.005%FS
Working power supply	Instrument power supply AC220V V. The sensor is powered by 5V.
Weight	Around 0.3kg
External dimension	159*122*79
Opening size	150*75
Power consumption	＜ 5W
Operating temperature	-20~+65℃

Instrument selection

content	HY-XS		Code description		
Outline dimension		C	C，160*80mm		
		Q	Q,96*48mm		
Supply electricity		A	AC 220V		
		B	DC 10-30v (this option is not available for 160 * 80 size)		
Alarm (optional)		2~4	2-4 sets of relay outputs (96*48 has only two sets of relay options)		
Transfer (optional)			D1	(4-20)mA (analogue 232, 1 out of 2. 96*48,220V power supply without this option) (0-5)V, (0-10)V (analogue 232, choose 1 from 2. 96*48,220V power supply without this option)	
			D2	(4-20)mA (analogue 232, 1 out of 2. 96*48,220V power supply without this option) (0-5)V, (0-10)V (analogue 232, choose 1 from 2. 96*48,220V power supply without this option)	
Communication (optional)			3	232 communication (analogue 232, 1 out of 2. 96*48,220V power supply without this option)	
			4	485 communication	
External reset (96*48 size standard, 160*80 optional)I			I	Starting peak; Stop the peak; Zero; Start-stop peak; Clear the peak; Peeling;	

1.4 Interface Definition (Back View)
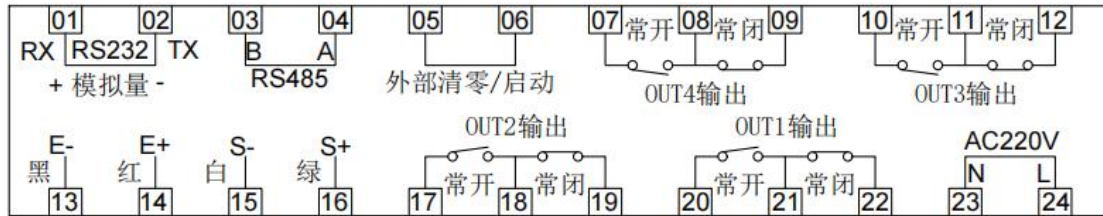
Statement

1: 23 (n) and 24(L) supply power to the instrument, 220AC；；

2: 20/21 is the normally open point of OUT1 relay, and 21/22 is the normally closed point of OUT1 relay;

17x18 is the normally open point of the OUT2 relay, and 18x19 is the normally closed point of the OUT2 relay.

10 + 11 is the normally open point of OUT3 relay, and 11 + 12 is the normally closed point of OUT3 relay; (optional function).

07x08 is the normally open point of OUT4 relay, and 08swap 09 is the normally closed point of OUT4 relay.

(optional function)

3: 13 external power supply negative sensor black line; 14 external power supply positive sensor red line.

15 sensor input negative sensor white line; 16 sensor input positive sensor green line.

4: optional analogue output 4-20mA or 0-10V 1 is positive and 2 is negative (optional function 232 / analogue 2 choose 1). Optional 232output 1 is RX,2, is TX,5 is GND (optional function 232 / Analog 2 choose 1).

5: at 485, 03 is 485B, and 04 is 485A. (optional function).

6: optional external zeroing or external startup shorting 05Accord 06 zeroing/startup is effective. (optional function)

Chapter 2 Operation Methods

2.1 Keys and Definition of Display Area
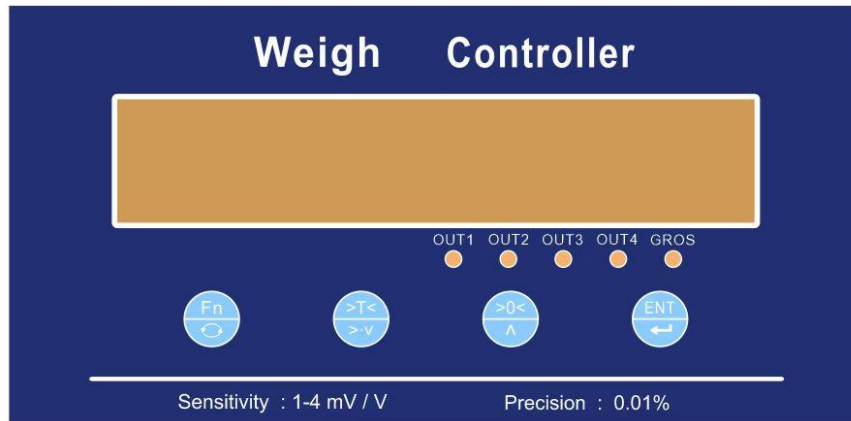
A total of 4 buttons: [Fn] [>T< >·V] [>0< ∧] [ENT]

[Fn]: Enter the menu/go back to the previous level. Long press the main screen and enter the password 000123 to unlock it.

[>T< >·V]: Press the weigh screen for 3 seconds for peeling (zero point is not saved when power is off and restarted), and the menu screen is for changing menu options; Modify the parameter screen and move the cursor.

[>0< ∧]: Press the weigh screen for 3 seconds to set the zero (power off to save the zero again); The menu screen is to change menu options; Modify the parameter screen and increase the value. [ENT]: Switch the gross/net weight in the weighing screen; The other screen is to confirm this operation.

OUT1-OUT4 outputs instructions for 4-way relays.

GROS light, gross weight; GROS extinction, net weight

2.2 Parameter display and setting

Before entering parameters, press [Fn] in the main screen, and enter password 000123 to unlock.

Press on the main screen [Fn] to enter the parameter setting screen. At this time, the first line shows 01-SEt (system parameter), press [>T< >·V] [>0< ∧], and press to switch between 02-APP (application parameters), 03-CAL

(system operation) and 04-INF (system information). After selecting the setting function，press![ENT] to enter the corresponding parameter table. At this point, press![>T<][>0<][>·v][∧] to switch to display other parameters. Press![ENT] to enter the parameter modification state or the next level display. Press![Fn] and hold the key for more than 3 seconds to exit the weight display interface directly.

2.2.1   01-SEt System parameters

On the main screen, when you press![Fn], 01-SEt is displayed. Press![ENT]to enter the system parameter, which contains the following parameters:

Display symbol	Define	Default value (range)	Description	PLC register address Remarks: MODBUS address minus one.
01-000	Decimal point	2(0-4)		1001
01-001	Measuring range	100.00(0-9999.99)	If the weight is greater than this value, prompt OL.	1003
01-002	Zero point	0(0-999999)	The saved zero sample value.	1005
01-003	Linear coefficient	1000(1-999999)	The coefficient is formed when the correction is full.	1007
01-004	Sampling frequency	2(0-3)	0:10 1:40 2:640 3:1280。	1009
01-005	Filtering method	0(0-0)	Selection of filtering method. Fixed as Kalman filter.	1011
01-006	Filter level	16(0-19)	The larger the value, the better the filtering effect, but the weight display is more lagging	1013
01-007	Refresh time	0.10(0-9.99)	The interval for refreshing the screen	1015
01-008	Score value	0(0-5)	0:1 1:2 2:5 3:10 4:20 5:50	1017
01-009	Stable range	0.01(0.00-99.99)	When this value is greater than 0, stability is judged.	1019
01-010	Steady time	0.30(0.00-9.99)	During this time, if the weight change is within a stable range, it will be stable	1021
01-011	Creep range	0.00(0.00-9999.99)	When this value is greater than 0, creep correction is carried out	1023
01-012	Creep time	10.00(0.00-99.99)	During this time, if the weight change is within the creep range and has been stable, creep correction shall be carried out.	1025
01-013	Zero range	0.00(0.00-9999.99)	When this value is greater than 0, the automatic zero-setting operation is performed.	1027
01-014	Zeroing time	1.00(0.00-9.99)	During this time, if the weight is within this range and has been stable, an automatic zero setting will be performed. Sustained stability is only set to zero once.	1029
01-015	Mailing address	1(0-128)		1031
01-016	232 port baud rate	1(0-4)	0:9600 1:19200 2:38400 3:57600 4:115200	1033
01-017	232-port check	0(0-2)	0: No parity 1: Even parity 2: Odd parity	1035
01-018	232 port function	0(0-9)	0:RTU 1: Active transmission and the rest: standby.	1037
01-019	232 port 32-bit sequence	0(0-3)	0:1234 1:2143 2:3412 3：4321	1039
01-020	485 port baud rate	1(0-4)	0:9600 1:19200 2:38400 3:57600 4:115200	1041
01-021	485-port check	0(0-2)	0: No parity 1: Even parity 2: Odd parity	1043

01-022	485 port function	0(0-9)	0:RTU 1: active transmission	1045
01-023	485 port 32-bit sequence	0(0-3)	0:1234　　1:2143　　2:3412　　3:4321	1047
01-024	Active transmission interval	200(1-1000)	The unit is Ms.	1049
01-025	Piecewise correction points	0(0-12)	Set to 0 without correction.	1051
01-026	Manual zeroing/peeling range	0.00(0.00-9999.99)	When this value is greater than 0, and when the gross weight is in this range, manual zeroing/peeling is allowed.	1053
01-027	Power-on zero range	0.00(0.00-9999.99)	When this value is greater than 0, and when the absolute value of gross weight is less than this range, the power-on zero operation is carried out.	1055
01-028	Power-on zero time	1.00(0.00-9.99)	After this time, if the absolute value of weight is within the zero range of power-on, it will be set to zero once.	1057
01-029	5, 6 terminal turn-in function selection	1(0-29)	0: none; 1: start peak; 2: stop peak; 3: set zero; 4: start and stop peak; 5 clear peak; 6: peel; rest standby	1059
01-030	AO function	0(0-9)	0: Forward 4-20mA 1: Bidirectional 4-20mA 2: Forward 0-10V 3: Bidirectional 0-10V	1061

2.2.2　02-APP Application parameters

Press on the main screen. When 01-SEt is displayed, press   to switch the display to 02-APP, and press to enter the display of application parameters, including the following parameters:

Display symbol	Functions	Default value (range)	Description	Register
02-000	Definite value1	100.00(-9999.99-9999.99)	OUT1 is described as S1 below.	1101
02-001	Definite value2	400.00(-9999.99-9999.99)	OUT2 is described as S2 below.	1103
02-002	Definite value3	600.00(-9999.99-9999.99)	OUT3 is described as S3 below.	1105
02-003	Definite value4	900.00(-9999.99-9999.99)	OUT4 is described as S4 below.	1107
02-004	Peak threshold value	10.00(0.00-9999.99)	The trigger point is when the peak is triggered automatically.	1109
02-005	Minimum peak time	0.20(0.00-9.99)	The following description is Z.	1111
02-006	Application Functions	0(0-9)	Minimum time for peak detection.	1113
02-007	OUT1Functions	1(0-59)	Note 1: the real-time weight is W. Peak weight P. The parameter 02-000 is S1.	1115

02-008	OUT2Functions	2(0-59)	The parameter 02-001 is S2. The 02-002 parameter is S3. The 02-003 parameter is S4. The peak threshold value is Z.	1117
02-009	OUT3Functions	3(0-59)	1 ： W>S1　　　　2:W<=S1 3:W>S2　　4:W<=S2 5RV W > S2 and W < = S16RU W < = Z.	1119
02-010	OUT4Functions	4(0-59)	7VOR P > S18RU P < = S19RV P > S210RU P < = S2. 11v P > S2 and P < = S1. 12VR W > S3 13R W < = S3 14R W > S4 15R W < = S4. 16W > S4 and W < = S3 17lv P > S3 18R P < = S3 19R P > S4 20R P < = S4. 21VR P > S4 and P < = S3. 22: peak detection 23: sampling error. Rest: standby	1121

Note

1: All the above parameters are 32-bit plastic data.

2. In principle, do not communicate related parameters through communication operations.

2.2.3　03-CAL System operation

In the main screen, press Fn, 　 when 01-SEt is displayed, you can press >T< >0< to switch the display to

03-CAL, and press ENT enter the Functions operation of the module, such as zero calibration and full calibration.

The operations included are as follows:

| Display symbol	Functions	Description
03-000	Zero calibration	
03-001	Full calibration	
03-002	Sectional adjustment	

Zero calibration**:** When 03-000 is displayed, press ENT to display the sampled value, and then press ENT again

to display the 3-second countdown. When the timer ends, the zero point will be automatically saved and returned to 03-000.

Full calibration: When 03-001 is displayed, first put a heavy object (weight) on the weighing platform, then

press [ENT] and input the weight of it, and press [ENT] to confirm. At this time, the weight of the heavy object will be displayed. If the signal is wrong, an ERR error will be prompted. At this point, press [ENT], displaying the 3-second countdown. When the time is over, the full-scale coefficient value will be automatically saved and returned to 03-001.

Sectional adjustment: When 03-002 is displayed, press [ENT] to select 0 and 1. When you select 0 and press [ENT], the original weight value is displayed. According to the actual needs, record the weight points that need to be adjusted by stages from small to large. Then press [Fn] to return to the 03-002 display, then press [ENT] and select 1, and press [ENT] The prompt Pr--xx indicates the input of the original weight value, and the prompt co--xx indicates the input of the adjustment factor. Xx represents the modified dot number, which can be changed by [>T< >-v] [>0< ∧]. Adjustment factor = actual weight / original weight, the calculation retains 4 decimal points.

2.2.4 04-INF System information

On the main screen, press [Fn]. When 01-SEt is displayed, press [>T< >-v] [>0< ∧] to switch the display to 04-INF, and press [ENT] to enter the Functions operation of the module, such as zero calibration and full calibration. The operations included are as follows:

Version only for query:

Display symbol	Functions	Description
04-000	Version and other queries	Query version, instrument error and other information.
04-001	Password management, etc	Set password, restore default, etc.
04-002	Factory test	Factory testing and related factory operations

manufacturers' use.

Password management, etc: When 04-001 is displayed, press [ENT], and then "01-pass", "02-def" and "03-fac" can be displayed by pressing [>T< >-v] [>0< ∧]

When "01-PASS" is displayed, press [ENT] to modify the password. Enter the original password first, and then enter the new password.

When "02-dEF" is displayed, press [ENT], then select YES, and then press [ENT] to restore the default.

When "03-FAC" is displayed, it is only used by manufacturers.

Factory test: When 04-002 is displayed, press [ENT] and then the sampled values, "dI-xxx", "do- x", "--Ao--" and "Errxxx" can be displayed by pressing [>T< >-v] [>0< ∧].

"dI-xxx" indicates the on state, and xxx means I1, I2 and i3.

"do- x" is the display of the open state. Press [ENT] to change X, where 1-7 indicates o1-o7 respectively, and 0 indicates no output.

"--Ao--" is the setting of AO zero/full point, press [ENT]. Enter zero point for "Z xx", enter full point for "F

xx" after pressing ![ENT] to save, and press ![ENT] to save after adjustment. When adjusting the value, you can use a multimeter to measure whether the force output voltage value is correct. (For details, see the following analogue adjustment steps)

"Errxxx" is a sensor error query, and non-zero indicates that there is a sensor error. Bit0,bit1, sensor excitation disconnection; Bit2, overflow, at this time, the signal line may be broken or the sensor may be faulty; Bit3, sampling module failure;

Analogue adjustment steps

Steps	operate	Description
1	Range adjustment	Press the meter ![Fn] to display 000000, press the parameter value ![>0< ^] to move the cursor, press modify parameter ![>T< >·v] enter password 000123, press save password ![ENT], then press enter menu ![Fn] to display 01-SEt, press ![ENT] to enter and press ![>T< >·v] to find 01-001, and press enter parameter ![ENT] to enter the actual range of the sensor. Remarks: If multiple sensors are used together, you need to enter the total range of multiple sensors.
2	Analog zero adjustment	After entering the password, the main interface will display 01-SEt in the enter menu by pressing ![Fn], 04-INF will be found in the menu by pressing ![>0< ^]. Press ![ENT] to enter the submenu, press ![>0< ^] to find 04-002 to enter a string of numbers, then press ![ENT] to find a series of numbers and press ![>T< >·v] to find- Ao-- and press ![ENT] to enter, displaying Z * * * at this time, using the multimeter, with the red stylus connected to the analogue positive pole of terminal 1 and the black stylus connected to the analogue negative pole of terminal 2, observe the multimeter, adjust the parameter value of z * * *, press ![>0< ^] to move the cursor according to the parameter value, and press ![>T< >·v] to modify the parameter, and the multimeter value will be adjusted according to the parameter value. Adjust the parameters to be close to 4mA or 0V, and then press ![ENT] to save. End of analogue zero adjustment.
3	Analog full-scale adjustment	After adjusting the zero point according to step 2, press ![ENT] and the instrument will display F * * * to enter the analogue full adjustment. Adjust the parameter value of F * * * with the multimeter. Press ![>0< ^] to move the cursor according to the parameter value. Press ![>T< >·v] to modify the parameter, and the multimeter value will change according to the adjustment of the parameter value. Press ![ENT] to save after adjusting the parameter to be close to 20mA or 10V. Analog full adjustment is over.

Auxiliary explanation

3.1   Modbus Communication Protocol

The default is a 19200 baud rate, 8 data bits, no check, and 1 stop bit [19200,8, N,1] communication setting. All data are 32-bit plastic data, occupying 2 registers, totalling 4 bytes.

Functions	Data class length	Description	PLC register address. Note: MODBUS address minus one
Weight	32-bit plastic surgery	Write 0: zero correction; write other values to indicate that the input weighs the weight and the correction is full	1
Net weight	32-bit plastic surgery	If the weight is 2 decimal places and the weight is 10.00, then write 1000	3
Tare weight	32-bit plastic surgery	The 0 bit is in the on state and the 3-6 bit is in the on our state.	5
Sampling value	32-bit plastic surgery	Sampling error	7
In-and-out state	32-bit plastic surgery	Bit 0, 1, excitation line may be broken; bit 2, signal overflow, sensor may be broken or signal line may be broken; bit 3, sampling module error	9
Other status	32-bit plastic surgery	Description	11

3.2 Other communications

3.2.1   Active transmission protocol

Start symbol	symbol^{+/-}	Data[6 Bit]	Decimal point[0-3]	XOR check	End
0x02	0x2B/0X2D	6 bytes	0x30-0x33	2 bytes	0xFF

1: Data is transmitted in ASCII code. For example, if 1234 is displayed, pass hexadecimal 30 30 31 32 33 34

2: The XOR operation of all data before the XOR check digit except the start character will obtain a byte of data, and then convert this byte into two ASCII codes, for example, the calculated check is 0x4A, and its corresponding hexadecimal ASCII is 34 41.

3.3 Other functions

If you need Ethernet Functions, contact the manufacturer in advance. You can obtain Ethernet configuration and test tools from the manufacturer.

3.4 MODBUS   RTU Communication example

The address of the company adopts the address description rule of the Siemens system, and the actual instruction is sent. The instruction is hexadecimal, and the address needs to be reduced by 1.

Host to slave machine read weight operation

The host reads the 32-bit weight operation of register 1, sends the instruction to read, register address -1, the default start register address starts from 0, then the message is:

Equipment address, station number.	Functions No.	Data address	Read data number	CRC Check
01	03	00 00	00 02	C4 0B

The single-chip microcomputer receives this string of data according to the data calculation CRC check to determine whether the data is correct, if the judgment data is correct, return the information to the host, the returned information is also in format.

Example: return content

Equipment address, station number.	Functions No.	Number of data bytes	Four bytes of data	CRC Check
01	03	04	00 01 E2 40	E2 A3

The returned four hexadecimal bytes of data are converted into decimal weight, which is 123456

The host writes data operations to the slave computer.
Zero clearance and calibration instructions:

The host computer carries out the data operation of writing 32 bits in the No. 1 register.

For example, if zero is cleared, the hexadecimal message is:

Equipment address, station number.	Functions No.	Data address	Number of registers	Number of bytes	Four bytes of data	CRC Check
01	10	00 00	00 02	04	00 00 00 00	F3 AF

Example: calibrate the weight of weight 100. write 1000 if you need to add one decimal place, 10000 if you need to add 2 digits, and take hexadecimal 100.00 as an example:

Equipment address, station number.	Functions No.	Data address	Number of registers	Number of bytes	Four bytes of data	CRC Check
01	10	00 00	00 02	04	00 00 27 10	E9 93

Return content:

Equipment address, station number.	Functions No.	Data address	Number of registers	CRC Check
01	10	00 00	00 02	41 C8