Guideway weighing transducer

V2. 1

Instruction Manual

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Contents

1 Summary

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 24 bit ∑-△ADC chip,and the analog signal of bridge load cell is converted into digital signal. It also have 2 DI and 2 DO,and two analog outputs, which can convert 4-20mA or 0-10V output at will [module internal dial conversion].

Suitable for 10-30vdc power supply system.24 V power supply is recommended.

This product also has the function of sensor circuit detection, that is, when the sensor is not connected or the sensor is faulty (including the wiring falling off, etc.), the corresponding alarm will be given [effective when only one sensor is connected to each channel].

Product features:

1. It can prevent RFI / EMI interference and has strong EMC characteristics;
2. 10-30v DC supply;
3. High speed 24 bit ∑ - △ ADC sampling, more than 500Hz sampling, control output and sampling interval synchronization;

4. Complete sensor fault detection function, such as signal overrun, module sampling fault, sensor line connection fault, etc。
5. Complete communication interface， Standard RS 232 and 485.

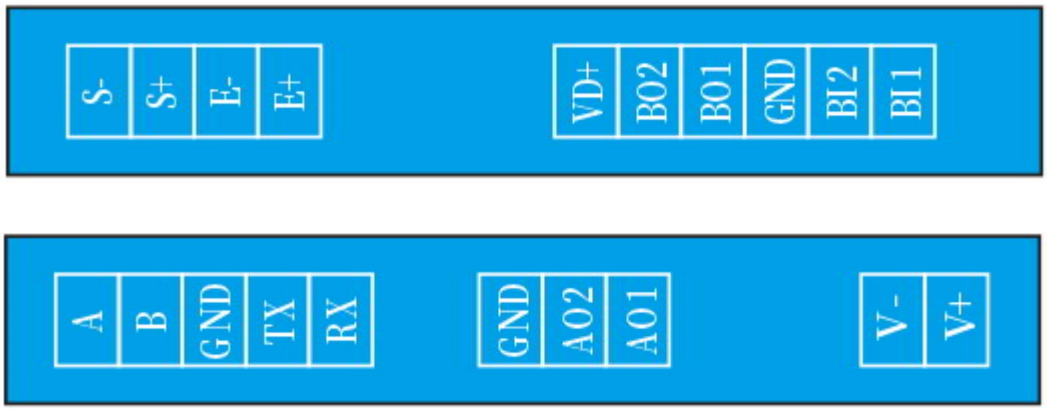
1.2 Safety tips

1. The instrument has anti-interference design. Be sure to ground the instrument reliably and separate it from the AC power supply ground wire;
2. Do not use in flammable gas environment;
3. Avoid direct sunlight;
4. The communication station is recommended to use the same 24 V power supply as the module, otherwise the communication connection needs to be transmitted through the isolation module [for example, the PLC is AC220 V, and the communication isolation module needs to be added between PLC and this module].

1.3 Technical parameters and dimensions

Measurement signal	-20mV~20mV, Each can drive 8 load cells with 350 ohm
Sampling frequency	500Hz
Accuracy	III level
Resolution	1/500000
DI/DO	2 DI, 2 DO, Low level active2 channels of analog quantity [4-20mA or 0-10V can be selected for code dialing]
Communication	rs 232,rs 485.
Nonlinearity	0.005%FS
Power	10-30V DC.Sensor voltage 5V.
Weight	About 0.1kg
Dimensions	92*72*59
Power waste	< 5W
Temperature	-20~+65℃

1.4 I/O



Explain

1：V + and V - to connect the DC power, and 24 V DC is recommended；

2：E+、E-、S+、S- are loadcell interface；

3：A / B is 485 interface；GND、TX、RX is 232 interface；

4：BO1,BO2 is DO terminal，Low level active。VD + must be connected to the positive power supply of relay；

5：BI1,BI2 is DI terminal，valid for GND，NPN type photoelectric junction。AO1 and AO2 are analog outputs, which are valid for GND. Open the shell, you can switch 4-20mA or 0-10V by on-board dialing

2 Operation method

2.1 Key and display area definition

For 4 keys：

Fn:Enter the menu / return to the previous level. Long press on the main screen, enter the password to unlock.

>T<: The weighing screen is tare, and the menu screen is changing menu options; the parameter screen is modifying, and the cursor is moving;

>0<： The weighing screen is zero; the menu screen is to change the menu options; the parameter screen is to modify and increase the value;

ENT： Confirm this operation.

2.2 Parameter display and setting

Before inputting parameters, press Fn in the main screen， input the password 123；

Press Fn in the main screen to enter parameter setting screen， 01-set is displayed(System parameter)， Press >T< >0<， can switch the display02—APP(Application parameters)、03-CAL(System operation)、04-INF(System information).Press ENT can enter the corresponding parameter table.then，press >T< >0< can switch display other parameters. Press ENT，enter

parameter modification status or next level display.Press 

more than 3 seconds， You can directly exit to the weight display interface.

2.2.1 01-SEt System parameter

Press 

in the main screen,01-set is displayed,press 

， Enter the system parameter display,The parameters included are shown in the following table：

Display	Definition	Default(Range)	Describe	REG
01-000	decimal point	2(0-4)		1001
01-001	Range	100.00(0-9999.99)	If the weight is greater than this value, it indicates OL	1003
01-002	Zero	0(0-999999)	Saved zero AD values.	1005
01-003	Coefficient	1000(1-999999)	Coefficient formed at full calibration.	1007
01-004	Unused			1009
01-005	Unused			1011
01-006	Filter	16(0-19)	The larger the value is, the better the filtering effect is, but the weight display lags behind.	1013
01-007	Unused			1015
01-008	Division	0(0-5)	0:1 1:2 2:5 3:10 4:20 5:50。	1017
01-009	Dyn.Range	0.01(0.00-99.99)	When this value is greater than 0, it starts to judge whether it is stable.	1019
01-010	Dyn.Time	0.30(0.00-9.99)	During this time, if the weight change is within the stable range, it will be stable.	1021
01-011	Creep Range	0.00(0.00-99.99)	When this value is greater than 0, creep correction is carried out.	1023
01-012	Creep Time	10.00(0.00-99.99)	In this time, the weight change is in the Creep Range and is stable, so the creep correction is carried out.	1025
01-013	Zero Range	0.00(0.00-99.99)	When the value is greater than 0, the auto zero operation is performed.	1027
01-014	Zero Time	1.00(0.00-9.99)	During this time, if the weight is within the range and is stable all the time, it will be automatically set to zero. Continuous stability is set to zero only once.	1029
01-015	Address	1(0-128)		1031
01-016	Baud of 232	1(0-4)	0:9600 1:19200 2:38400 3:57600 4:115200	1033
01-017	Check of 232	0(0-2)	0:None 1:Even 2:Odd	1035

01-018	Function of 232	0(0-9)	0:RTU 1:Send Other：Unused	1037
01-019	Order of 232	0(0-3)	0:1234 1:2143 2:3412 34321	1039
01-020	Baud of 485	1(0-4)	0:9600 1:19200 2:38400 3:57600 3:115200	1041
01-021	Check of 485	0(0-2)	0:None 1:Even 2:Odd	1043
01-022	Function of 485	0(0-9)	0:RTU 1:Send 2：TCP(Valid with Ethernet module) Other：Unused	1045
01-023	Order of 485	0(0-3)	0:1234 1:2143 2:3412 34321	1047
01-024	Active sending interval	200(1-1000)	Unit is ms	1049
01-025	Unused	0(0-12)		1051
01-026	I1 Functions	3(0-29)	0:None； 1：Start； 2：Stop； 3：Pack bag； 4：Zero； 5：Pause and release bag 7：Push package in place 8：Slave handshake input 12：Clear data Other：Unused	1053
01-027	I2 Functions	5(0-29)		1055
01-028	o1 Functions	1(0-59)	0:Communication control； 1：Clip / loose bag； 2：SP1； 3：SP2； 4：SP3； 5：Discharge/Fall bag 7：Final 8：Push bag Other：Unused Functions 7：if 02-000 is 3，thisfor the discharge output of the slave； is 4， It is the handshake signal sent from slave to host.	1057
01-029	o2 Functions	2(0-59)		1059
01-030	AO1 Functions	0(0-9)	0:Forward 1:Bidirectional The voltage or current output is set by on-board dialing	1061
01-031	AO2 Functions	0(0-9)		1063

2.2.2 02-APP Application parameters

Press 

in the main screen， 01-set is displayed， press 

switch display to 02-APP, press 

， enter application parameter display，the parameters included are shown in the following table：

Display	Definition	Default(Range)	Describe	REG
02-000	Set 1	400.00(-9999.99-9999.99)		1101
02-001	Set 2	400.00(-9999.99-9999.99)		1103
02-002	Null	10.00(0.00-9999.99)	Trigger point of automatic peak triggering	1105

02-003	Peak minimum time	0.20(0.00-9.99)	Minimum time for peak detection	1107
02-004	APP	0(0-9)	0:Real time value 1: Peak value	1109

Note 1: when set to peak value, the module display area shows peak value

2: All the above parameters are 32-bit shaping data

3: In principle, do not operate communication related parameters through communication

2.2.3 03-CAL System operation

Press 

in the main screen，01-set is displayed，press 

switch display to 03-CAL，Press 

enter the function operation of the module， For example, zero calibration, full calibration, etc. The operations included are shown in the following table：

Display	Functions	Describe
03-000	Zero	
03-001	Full	
03-002	Unused	

Zero：When 03-000 is displayed，press 

，display AD values，Press 

again，Show 3 seconds countdown, the end of timing, automatically save zero, and return to 03-000

Full：When 03-001 is displayed，Put the weight on the weighing table first，then press 

，Input the weight， press 

， the weight will display.if the AD have some error， it will display Err.Then press 

， Show 3 seconds countdown, the end of timing, automatically save zero, and return to 03-001.

2.2.4 04-INF System information

Press Fn in the main screen，01-set is displayed，press >T< >0< >·v ∧ switch display to 04-INF，Press ENT enter the function operation of the module：

Display	Functions	Describe
04-000	Version	Query version, instrument error and other information
04-001	Unused	
04-002	Test	Factory test and related factory operation

Version： For manufacturer's use only

Password： 04-001 is displayed，press ENT，press >T< >0< >·v ∧ can switch display “01-PASS”，“02-dEF”，“03-FAC”.

“01-PASS” For manufacturer's use only.

“02-dEF” is displayed，press ENT，then select Yes，Press ENT again，will default。

“03-FAC” is displayed，For manufacturer's use only.

Test： 04-002 is displayed，press ENT，press >T< >0< >·v ∧ can switch display AD、“dI-xxx”、“do-x”、“--Ao1-”、“--Ao2-”、“Errxxx”。

“dI-xxx” is DI state, xxx is I1, I2, I3 state。

“do- x” is DO state, press ENT，can make x change，1-7 means o1-o7,0, no output.

“--Ao1-”，“--Ao2-” is AO zero / full setting，press ENT.“Z xxxx” input zero，press ENT to save it，“F xxxx” input full，After adjustment can press ENT to save.When adjusting the value, the multimeter can be used to measure whether the output voltage value is correct.

“Errxxx” It's a sensor error query，A non-zero indicates a sensor error. Bit0, Sensor excitation disconnection; bit2, overflow, At this time, the signal line may be broken or the sensor may be faulty; bit3, Sampling module fault;

3 Supplementary notes

3.1 modbus Communication protocol

The default set is 19200,1 start bit，8 data bit，1 stop bit，none.

Name	Default(Range)	Describe	Address
Weight		Write 0:Zero；Write other values,means input the weight on scale. If the weight is 2 decimal points and the weight is 10.00, write 1000.	1
Packaging results			3
State		.00bi run；.01bit,pack；.02bit，finish；.03bit，fill；..05bit，DO test；06bit，SP1；.07bit，SP2；.08bit，SP3；.13bit，auto	5
AD			7
DI/DO state		If read：0-1bit is DI state，3-4 is DO state	9
Other state		AD fault。0 bit， The excitation line may break； 2 bit， overflow,Maybe the sensor is broken or the signal wire is broken； 3 bit， Module error.	11
Operate		If write： 1,Enter IO test；2,Exit IO test；	31
DO operate		901~903 Odd values correspond to o1~o7。 In test state,Can operate the corresponding output。 When register 1059 ~ 1061 (output function) is set to 0, write 1, corresponding to output, write 0, corresponding to output reset.	901~903

3.2 Other communications

3.2.1 Active sending protocol

START	[+/-]	DATA	DEC[0-3]	XOR	END
0x02	0x2B/0X2D	6 chars	0x30-0x33	2 chars	0xFF

1:The data is transmitted in ASCII code. For example, if 1234 is displayed, hexadecimal 30 31 32 33 34 will be passed.

2:The XOR operation is performed on all data[not contain a start character] before the XOR check bit， and can get a byte of data， Then the byte is converted into two ASCII codes. For example, the computed check is 0x4a, and the corresponding hexadecimal ASCII is 34 41.

3.3 MODBUS RTU Communication examples

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

Master to slave read data operation

The host reads 32 bits of register 1，the order is：

01	03	00 00	00 02	C4 0B
Slave	Function number	Data address	Data number	CRC check

Then the MCU receives the data, calculates CRC according to the data, and judges whether the data is correct, if the data is correct，The back data order like this：

01	03	04	00 01 E2 40	E2 A3
Slave	Function number	Data number	data	CRC Check

The four hex data are converted to decimal , which is 123456.

Master to slave write data operation

The host write 32 bits of register 1，the order is

Write the weight 123456，the order is：

01	10	00 00	00 02	04	00 01 E2 40	EB 3F
Slave	Function No.	Data Addr.	Reg.No.	Char No.	Data	CRC Check

Do Zero，the order is：

01	10	00 00	00 02	04	00 00 00 00	F3 AF

Back：

01	10	00 00	00 02	41 C8
Slave	Function No.	Data Addr.	Reg.No.	CRC Check

Modbus RTU CRC check code calculation method

```
//modbus CRC16

publicvoid  CRC16Calc(byte[] dataBuff,  int  dataLen)

{

    int  CRCResult = 0xFFFF;

    if  (dataLen < 2)

    {

         return;

    }

    for  (int  i = 0; i < (dataLen - 2); i++)

    {

           CRCResult = CRCResult ^ dataBuff[i];

            for  (int  j = 0; j < 8; j++)

            {

                    if  ((CRCResult & 1) == 1)

                    CRCResult = (CRCResult >> 1) ^ 0xA001;

                    else  CRCResult >>= 1;

            }

    }

    dataBuff[dataLen - 1] =Convert.ToByte(CRCResult >> 8);

    dataBuff[dataLen - 2] =Convert.ToByte(CRCResult & 0xff);

}
```