Multi-channel DC power digital isolation transducer manual
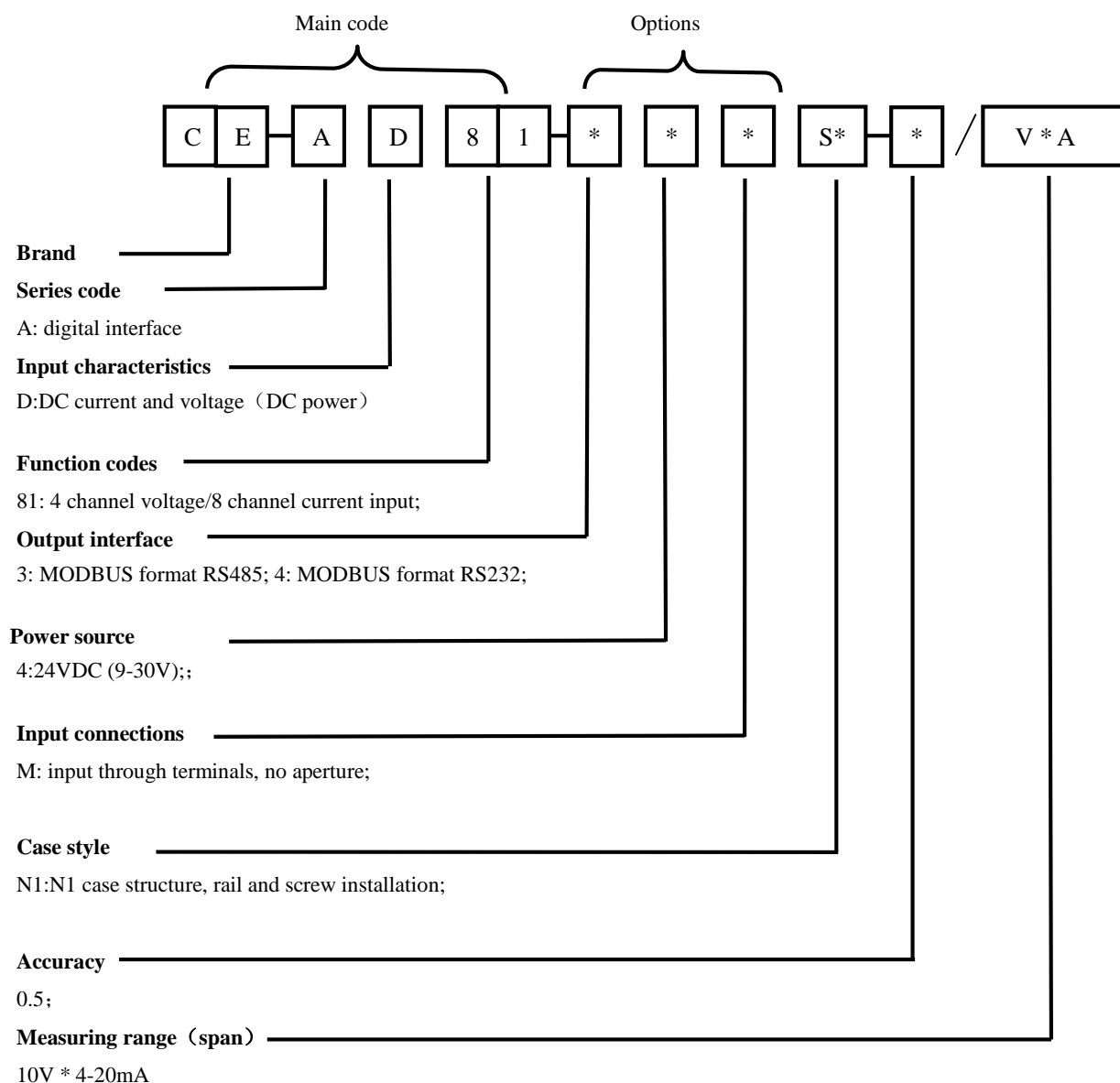
CE-AD81-34MN3-0.5

1 Overview

The main function of this product is to centralized measurement convert multi-channel standard DC transmission signal into digital signal output, can measure 8 channel current and 4 channel voltage input signal. Multi - channel DC intelligent transmitter can be widely used in a variety of industrial control and measurement systems, and mainly measure the 4 ~ 20mA or 0 ~ 10V output signal of a variety of pressure, temperature, flow and power transducer. Output communication interface is RS485 or RS232, wide range of power supply DC 9 ~ 30V, using the standard MODBUS-RTU communication protocol.

2 Part Number

CE-A product selection is as follows, in order to make your selected products accurate application, please read carefully.

Main code   Options

| C | E | A | D | 8 | 1 | * | * | * | S* | * | / | V * A |

Brand

Series code

A: digital interface

Input characteristics

D:DC current and voltage（DC power）

Function codes

81: 4 channel voltage/8 channel current input;

Output interface

3: MODBUS format RS485; 4: MODBUS format RS232;

Power source

4:24VDC (9-30V);;

Input connections

M: input through terminals, no aperture;

Case style

N1:N1 case structure, rail and screw installation;

Accuracy

0.5；

Measuring range（span）

10V * 4-20mA

3 Product Features

- ² Using high-precision 24-bit dedicated AD chip can reach 0.2 class.
- ² The wide ratio dynamic range, greater than 1000: 1.
- ² Use plug terminal wiring, easy for site
- ² Available with wide power supply: DC: 10-30V

² High reliability, power port to resist the surge voltage up to 4KV.

4 Specifications

Input signal

Input: 8 channel 0-20mA current and 4 channel 0-10V voltage.

Overload: overload 1.2 times the range can be measured correctly, overload 2 times the range of input 1S is not damaged;

Current Channel: the input impedance is 110Ω;

Voltage Channel: the input impedance is > 100KΩ;

Data update cycle: 800mS;

Communication output

Output interface: RS-485 (twisted pair line) ±15KV ESD protection, or RS-232 interface ±2KV ESD protection;

Communication protocol: standard MODBUS-RTU protocol;

Baud rate: 1200, 2400, 4800, 9600(default), 19200 bps;

Parity: Odd parity, even parity, no parity (default), set by software;

Address: 01H to FFH, factory default 01, set by software;
Isolation: voltage and current input are isolated from power supply and communication, the isolation voltage is 2500V DC;
Accuracy: 0.5;
Power supply: DC 9～30V ;
Power consumption: <0.5W;
Operating temperature: -20℃～60℃;
Storage temperature: -40℃～85℃, relative humidity: 5% to 95% no dew;
Installation: standard DIN rail installation of 35mm
Volume: 122mm * 70mm * 43mm;
Weight: 130 gram.

5 Case Style (marked in the figure Unit: mm)
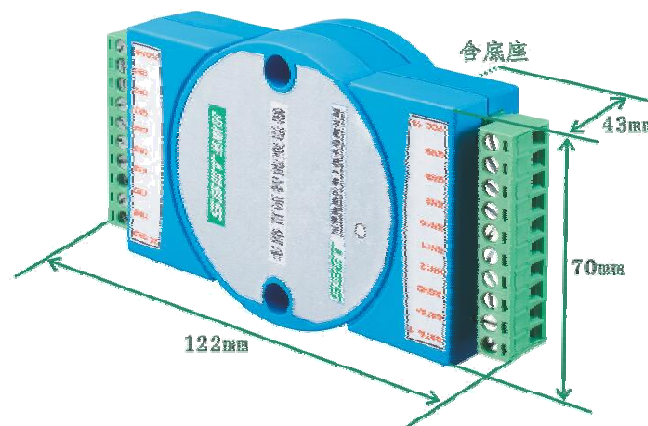5.1, Dimensions and Appearance (Unit: mm):

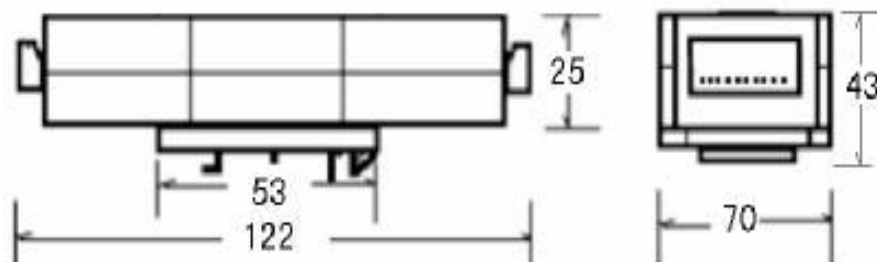Figure 1 CE-AD81-34MN3 product dimension diagram

Figure 2 CE-AD81-34MN3 DIN rail installation diagram

5.2 Terminal definition

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sales@ce-transducer.com

3rd Floor, building 1, Zaimao industrial park, Baoji road, Bantian, Longgang district, Shenzhen City, China   Post code: 518049

Table 1, Terminal Definitions Table

Input signal			Power and communication output		
Terminal	definition	Description	terminal	definition	Description
1	UIN4	4th channel voltage input	6	DATA-(RXD)	Negative of RS485
2	UIN3	3rd channel voltage input	7	DATA+(TXD)	Positive of RS485
3	UIN2	2nd channel voltage input	8	AGND	GND for RS485 output
4	UIN1	1st channel voltage input	9	GND	Negative of power supply
5	UIN-	GND for voltage input	10	VCC	Positive of power supply
11	IIN-	GND for input current			
12	IIN1	1st channel current input			
13	IIN2	2nd channel current input			
14	IIN3	3rd channel current input			
15	IIN4	4th channel current input			
16	IIN5	5th channel current input			
17	IIN6	6th channel current input			
18	IIN7	7th channel current input			
19	IIN8	8th channel current input			
20	IIN-	GND for input current			

Note 1, the voltage input signal and current input signal are in common ground

6 MODBUS Protocol

6.1 Format of data

(1) Function code 0x03 —— To read the contents of registers from the slave equipment.

The Message from the master equipment:

Address of the slave equipment	(0x01-0xFF 1byte)
Function code	(0x03 1byte)
Address of the first register	(2bytes)
Quantity of registers	(2bytes)
CRC code	(2bytes)

The correct responded message from the slave equipment

Address of the slave equipment	(0x01-0xFF 1byte)
Function code	(0x03 1byte)
Byte count	(2xN* 1byte)
Data section	(N*x 2 bytes)
CRC code	(2bytes)

(2) Function code10H---to set data of registers of the slave equipment

The message from the master equipment

Address of the slave equipment	(0x01-0xFF 1byte)
Function code	(0x10 1byte)
Address of the first register	(2bytes)
Quantity of registers	(2bytes)
Byte count	(2xN* 1byte)
The data written to the register	N*x 2 bytes)
CRC code	(2bytes)

The correct responded message from the slave equipment

Address of the slave equipment	(0x01-0xFF 1byte)
Function code	(0x10 1byte)
Byte count	(2bytes)
Data section	(2bytes)
CRC code	(2bytes)

Note: 1. For all Address of register, Quantity of registers and Contents of register (Data), their high order by is before their low order byte. But the low order byte of CRC code is before its high order byte.

2. The length of the register is 16 bits (2 bytes).

6.2 Format of commands and explanation of the registers

List of definitions of registers for electrical parameters data, address and baudrate, the transducer's name and check parity

Address of Register(Hex)	Contents of register	Quantity of registers	Attribute of register	Range of data
0010H	Current 1 road	1	Read only	-12000~+12000
0011H	Current 2 road	1	Read only	-12000~+12000
0012H	Current 3 road	1	Read only	-12000~+12000
0013H	Current 4 road	1	Read only	-12000~+12000
0014H	Current 5 road	1	Read only	-12000~+12000
0015H	Current 6 road	1	Read only	-12000~+12000
0016H	Current 7 road	1	Read only	-12000~+12000
0017H	Current 8 road	1	Read only	-12000~+12000
0018H	Voltage 1 road	1	Read only	-12000~+12000
0019H	Voltage 2 road	1	Read only	-12000~+12000
001AH	Voltage 3 road	1	Read only	-12000~+12000
001BH	Voltage 4 road	1	Read only	-12000~+12000
0020H	Address and Baudrate	1	Read/writ	Address (0-255) Baud rate (03-07)
0021H	Transducer's name	2	Read only	Depend on part number(4 bytes)
0023H	Check parity	1	Write	0-no check；1-ODD；2-EVEN；

(2) **Examples:**

For all Address of register, Quantity of registers and Contents of register (Data), their high order byte is before their low order byte. But the low order byte of CRC code is before its high order byte

A: Example for the command "To read the all data":

Address of slave equipment	Function code		Address of the first register		Quantity of register	CRC-L
0x03	0x00	0x10	0x00	0x0C	0x44	0x0A

B: Example for the command "To modify the address and baudrate":(Change the address from 01 to 02; set new baudrate to 9600 bps <code 06>)

Address of slave equipment	Function code	Address of the first register	Quantity of register	Data bytes count	Data written to register	CRC-H	CRC-H

0x01	0x10	0x00	0x20	0x00	0x01	0x02	0x02	0x06	0x20	0x52

Note: Codes for baudrate setting: 03-1200bps, 04-2400bps, 05-4800bps, 06-9600bps, 07--19200bps.

C: Example for the command "To read the transducer's name and configuration":

Address of slave equipment	Function code	Address of the first register		Quantity of register		CRC-L	CRC-H
0x01	0x03	0x00	0x21	0x00	0X03	0x01	0x03

D: Example for the command "To modify the parity bit":(Modified into odd parity)

Address of slave equipment	Function code	Address of the first register		Quantity of register		Data bytes count	Data written to register		CRC-H	CRC-H
0x01	0x10	0x00	0x23	0x00	0x01	0x02	0x00	0x01	0x10	0x00

Note: 0-no check, 1-ODD, 2-EVEN.

6.3 Data

  List of the format of data responded after the read command (suppose the rated value of voltage is 10V, the rated value of current is 20mA):

NO.	Name	Input value	Hex. Data (100%)		Decimal Data (100%)
			High byte	Low byte	
1	IIN1	20mA	27	10	10000
2	IIN2	20mA	27	10	10000
3	IIN3	20mA	27	10	10000
4	IIN4	20mA	27	10	10000
5	IIN5	20mA	27	10	10000
6	IIN6	20mA	27	10	10000
7	IIN7	20mA	27	10	10000
8	IIN8	20mA	27	10	10000
9	UIN1	10V	27	10	10000
10	UIN2	10V	27	10	10000
11	UIN3	10V	27	10	10000
12	UIN4	10V	27	10	10000

(1)Format of the data of current, voltage and power

2 bytes   Sign + Data (No Sign for AC voltage and AC current)

Range of the data: -12000~+12000

Meaning of the data: 10000 correspond to the rated input value. For example, when the maximum value of input current is 5.000A, the expected output value is10000D or 2710H and 2.500A correspond to 5000D or 1388H of the expected output

8-bit Low order byte   (responded data)

7	6	5	4	3	2	1	0（LSB）

8-bit High order byte

Sign 1=negative 0=positive	14	13	12	11	10	9	8

(2)Calculation of current and voltage:

$$UIN=U/10000*10 \qquad (V)$$

Thereinto:

U—— The data of voltage received by the master equipment. (2 bytes, high order byte ahead, the MSB is sign bit.)

$$IIN=I/10000*20 \qquad (mA)$$

Thereinto:

I—— The data of current received by the master equipment. (2 bytes, high order byte ahead, the MSB is sign.)

Please contact us if you need some internal calibrating commands for zero point calibration

7 Application notes and precautions:

7.1．Red indicator of the transducer: When the product is working normally, the red light flashes once in 0.8S and the data is updated when the red light is flashing.

7.2．Voltage input signal and current input signal ground access separately, can not be mixed together to reduce interference and measurement error;

8 Correct use of the transducer

8.1. Isolator installation

This model isolator uses standard DIN35 rail installation, easy to use. The installation method is as follows:

8.1.1 The transducer fixed on the side of the card slot and hook on the mounting rail;

8.1.2 Set the transducer side of the bayonet pressure to the rail, then the transducer installed to the rail;

8.1.3 Remove from the rail, pull down the pull-pin, you can remove the transmitter;

8.2. Isolators have been accurately set, users can power on after correct connection. Product has no special requirements on the auxiliary power, multiple transducers can share a common set of power supplies. Such as the purchase of commercially available power supply, which require the isolation voltage $\geq$ 2000VAC, AC ripple <10mV.

8.3. Connect the input and output signals in strict accordance with the isolator terminal definition diagram. Otherwise, the isolator may be damaged or the output value may be wrong.

8.4. For the accuracy of the isolator to be tested in the following conditions:

8.4.1 Degree of 0.05 or more standard signal source and measuring instruments (the level of the table used must be higher than the product grade index);

8.4.2 Power supply: nominal $\pm$ 5%, ripple $\leq$ 10mV, Ambient temperature: 25 ℃ $\pm$ 5 ℃, Relative humidity: RH (45 ~ 80)%;

8.4.3 Correctly connection according to the wiring diagram, preheat 5 to 20 minutes after the test;

Note: There are unknown and the technical indicators of the test methods, please contact our company.