

8/16-channel switch values digital transducer manual

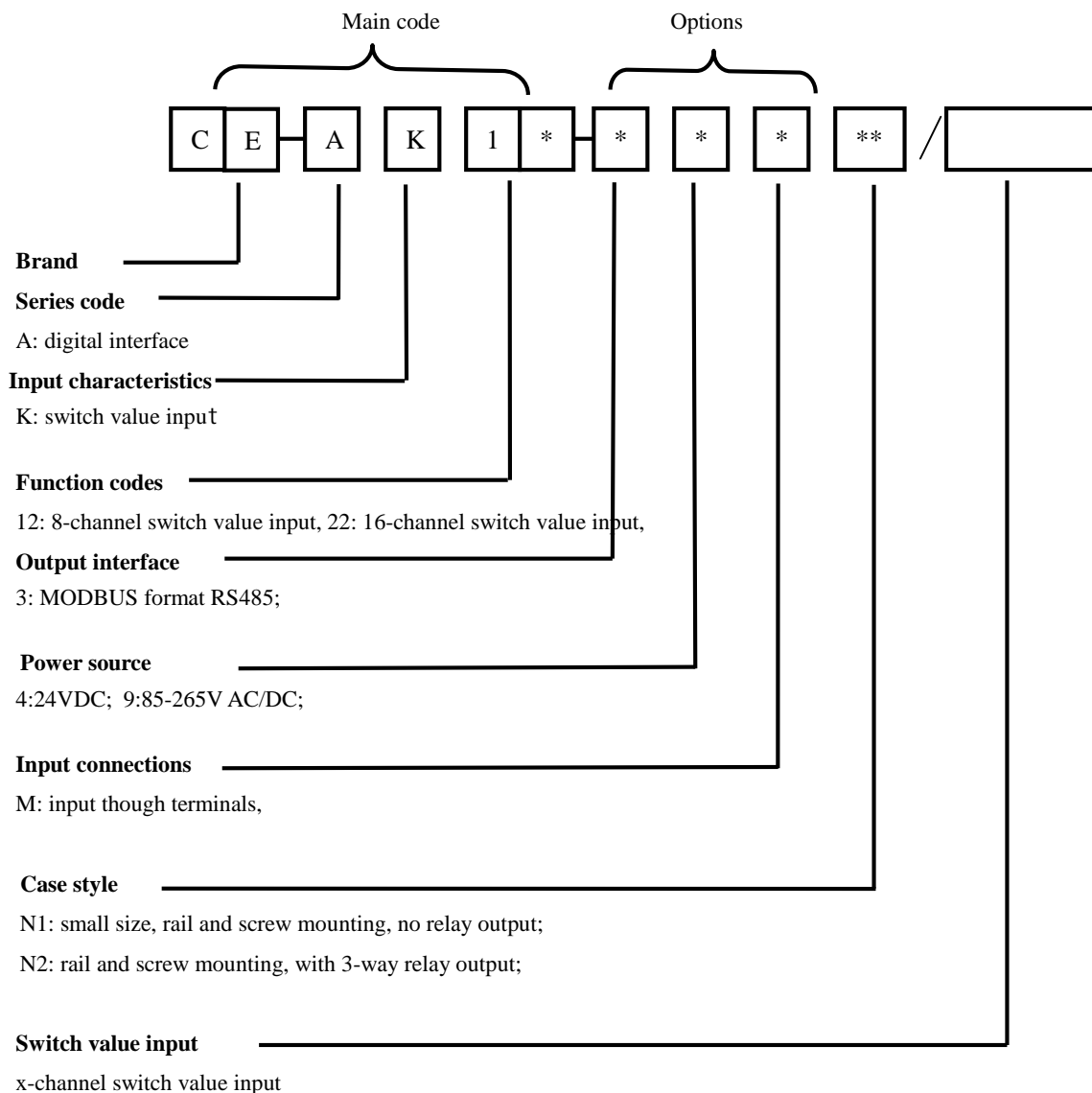
CE-AK*2-3*MN*

1 Overview

This product is a high-performance transducer of switch input measurement. The input and output of switch node is complete isolated from power supply and communication port, greatly improving the reliability of the product. It is widely used in various industrial measurement and control system, the switch status signal of the measured is transmitted to the corresponding host through the RS485 bus interface. At the same time it is with 3-way relay output and remote control, available to directly connect a variety of PLC and other equipment with the standard MODBUS protocol.

2 Part Number

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



3 Technical Specifications

- 2 Input - Passive contacts (Dry contacts);
- 2 Withstand voltage of the passive contacts — $\geq 24\text{VDC}$;
- 2 Output data — Values of 8/16 channels of switching signal input. ("1" means "on", "0" means "off".);
- 2 Remote control output ----- 3-way relay output (normally closed contact, contact capacity AC250V*5A);

- 2 Output interface —— RS-485 bus. 1200m, $\pm 15\text{KV}$ ESD protection;
- 2 Baudrate —— 1200, 2400, 4800, 9600, 19.2k bps;
- 2 Refreshing period —— 100 mS;
- 2 Isolation voltage ----- 2500V DC;
- 2 Quiescent power consumption —— $<750\text{ mW}$ (+24V);
- 2 Power supply —— +24V or 220V optional;
- 2 Operating temperature —— $-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$;
- 2 Installation method ----- rail or screw installation.

4 Case Style (marked in the figure Unit: mm)



Figure 4.1 CE-AK*2-3*MN2 type product shape

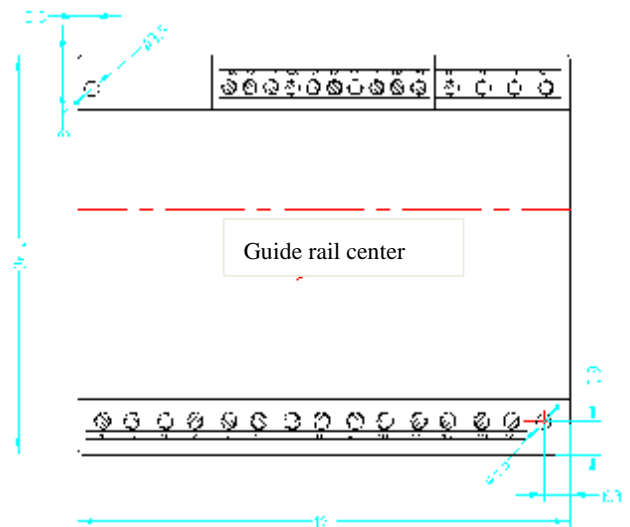


Figure 4.2 CE-AK*2-3*MN2 product installation diagram



Figure 4.3 CE-AK*2-3*MN1 type product shape

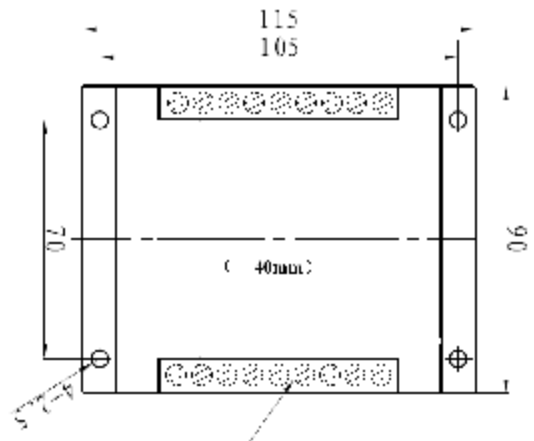
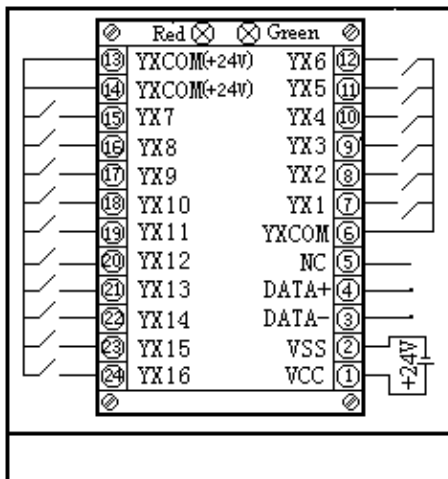


Figure 4.4 CE-AK*2-3*MN1 product installation diagram

5 Terminal definition and connection diagrams

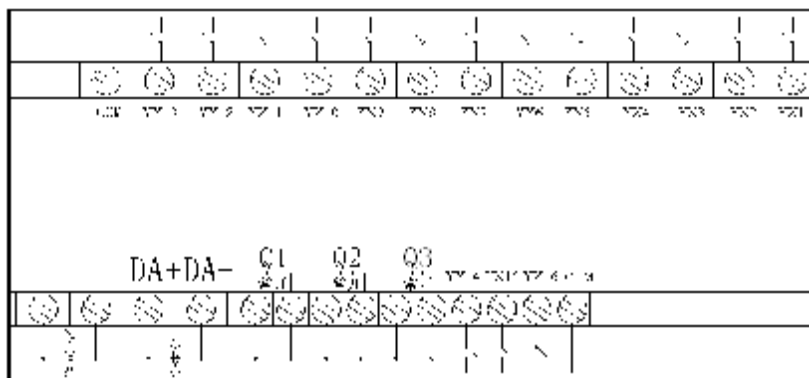
Wiring diagram of MN1 case product is shown in Figure 5.1, 5.2;



Pin	Function
13	Red
14	Green
15	YX7
16	YX8
17	YX6
18	YX5
19	YX4
20	YX3
21	YX2
22	YX1
23	(+24v)YXCOM
24	NC
25	DATA+
26	DATA-
27	N
28	L

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[illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible]



Function code	(10H	1byte)
Address of the first register	(2bytes)	
Quantity of registers	(2bytes)	
Byte count	(2xN*	1byte)
The data written to the register	(2x N*)	
CRC code	(2bytes)	

The correct responded message from the slave equipment

Address of the slave equipment	(01H-FFH	1byte)
Function code	(10H	1byte)
Address of the first register	(2bytes)	
Quantity of registers	(2bytes)	
CRC code	(2bytes)	

Note: 1 For all address of registers, quantity of registers and contents of registers (data), the high order byte 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 16bits (2 bytes).

2Format of commands and explanation of the registers

All of the following commands are illustrated with an address is 01 and baudrate is 06 (9600 bps);

2.1 The command “To read the data of all switching value inputs”:

A: Send command

Address of the slave equipment	Function code	Address of the first register		Quantity of registers		CRC-L	CRC-H
01H	03H	00H	10H	00H	01H	85H	CFH

Note: The values data will be stored in the first register 0000H, the high order byte is before their low order byte.

B: Return data

Address of the slave equipment	Function code	Data count	Data		CRC-L	CRC-H
01H	03H	02H	Values data H	Values data L	Check code	Check code

Note: “Values data” mean 8 bits of switching values. The most significant bit is the datum of switching value input 8 and LSB is the datum of switching value input 1.

2.2 The command “To read the data of transducer’s name and configuration”

A: Definition table of transducer’s name, address and baud rate register

Address of register (Hex)	Content of registers	Quantity of registers	Status of registers	Range of data
0020H	Address and baudrate	1	Read/write	Address(0-256) Baudrate(03-07)
0021H	Transducer’s name	2	Read only	Configured by product type (4 bytes)
0023H	Parity check	1	Read/write	0: no check, 1: odd check, 2: even parity; 3: 2 stop bits

Description: MN1 case products without parity mode;

B: Send command

Address of the slave equipment	Function code	Address of the first register	Quantity of registers	CRC-L	CRC-H
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B: Return data

Address of the slave equipment	Function code	Data count	Data			CRC-L	CRC-H
01H	03H	06H	Address core	Baudrate core	Model's name (4bytes)	Check code	Check code

2.3 The command "To modify the address and baudrate":

A: Send command: (Change the address from 01 to 02; set new baudrate to 9600 bps <code 06>)

Address of the slave equipment	Function code	Address of the first register		Quantity of registers		Data bytes count	Data written to register		CRC-L	CRC-H
01H	10H	00H	20H	00H	01H	02H	02H	06H	20H	52H

Note: The data of new address and baudrate will be stored in the first register 0020H, the high order byte is address data and the low order byte is baudrate code. Codes for baudrate setting: 03-1200bps, 04-2400bps, 05-4800bps, 06-9600 bps, 07- 19200 bps.

B: Return data

Address of the slave equipment	Function code	Address of the first register		Quantity of registers		CRC-L	CRC-H
01H	10H	00H	20H	00H	01H	00H	03H

3.4 The command "To control relay output" (MN1-case products do not have this function):

A: Register address table of switch value output

Use function code 05H of the Modbus to access the contents of the following address table, where ON means the relay is closed and OFF means the relay is released.

Address of the register (Hex)	Number of relays	Read/write	Function code	Data range
0001H	K1	W	05	FF00H =ON, 0000H =OFF
0002H	K2	W	05	FF00H=ON, 0000H =OFF
0003H	K3	W	05	FF00H =ON, 0000H =OFF

B: Send command (control pull of K1 relay)

Address of the slave equipment	Function code	Address of the first register		Data written to register		CRC-L	CRC-H
01H	05H	00H	01H	FFH	00H	DDH	FAH

C: Return data

Address of the slave equipment	Function code	Address of the first register		Data written to register		CRC-L	CRC-H
01H	05H	00H	01H	FFH	00H	DDH	FAH

The way to control other relays Ibid.

3.5 The command "To read the state of relay output (DO)" (MN1-case products do not have this function):

A: Use function code 01H of the Modbus to access the contents of the following address table, thereinto 1=ON, 0=OFF

Address of the data	Content of the data	Type of data	Read/write	Command word	Range of the data
0001H	DO1	BIT	R	01	1=ON,0=OFF

0002H	DO2	BIT	R	01	1=ON,0=OFF
0003H	DO3	BIT	R	01	1=ON,0=OFF

B: The command “To read the alarm status of 3-way relay output”

Send command:

Address of the slave equipment	Function code	Address of the first register		Read the quantity of switch bits		CRC-L	CRC-H
01H	01H	00H	01H	00H	03H	2DH	CBH

Return data:

Address of the slave equipment	Function code	Data bytes count	Return data	CRC-L	CRC-H
01H	01H	01H	05H	91H	8BH

Description: 05 is converted into binary number 00000101, relay 1 is closed, relay 2 is released, relay 3 is closed, and high 5 bits are meaningless

3.6 The command “To read the input state of switch value(function code 02, the standard MODBUS protocol read IO status of function code, MN1-case products do not have this feature)

A、Use s function code 02H of the Modbus to access the contents of the following address table, thereinto1=ON, 0=OFF

Address of the data	Content of the data	Type of data	Read/write	Command word	Range of the data
0001H	YX1	BIT	R	01	1=ON,0=OFF
0002H	YX2	BIT	R	01	1=ON,0=OFF
0003H	YX3	BIT	R	01	1=ON,0=OFF
.....					
000EH	YX14	BIT	R	01	1=ON,0=OFF
000FH	YX15	BIT	R	01	1=ON,0=OFF
0010H	YX16	BIT	R	01	1=ON,0=OFF

B: To read the switch value input state from 1to 16 channels of NO.1 collector.

Send command:

Address of the slave equipment	Function code	Address of the first register		Read the quantity of switch bits		CRC-L	CRC-H
01H	02H	00H	01H	00H	10H	28H	06H

Return data:

Address of the slave equipment	Function code	Data bytes count	Return data		CRC-L	CRC-H
01H	02H	02H	06H	05H	7AH	1BH

Description: 06H is converted into binary number 00000110, switch value input of first 2-way and 3-way are closed, the first way is open, and the ways from 4 to 8 are off.

05H is converted into binary number 00000110, switch value input of first 9-way and 11-way are closed, he 10- way is open, and the ways from 12 to 16 are off.

Table 1, setting the switch function code (MN1-case products do not have this feature)

(Switch pull to ON position represents 1and pulled to OFF position represents 0)



SW.8	Baudrate setting	SW.7	SW.6	SW.5	SW.4	SW.3	SW.2	SW.1	Address settings
0	9600	0	0	0	0	0	0	1	1
1	19200	0	0	0	0	0	1	0	2
		0	0	0	0	0	1	1	3
		0	0	0	0	1	0	0	4
								
		1	1	1	1	1	0	0	124
		1	1	1	1	1	0	1	125
		1	1	1	1	1	1	0	126
		1	1	1	1	1	1	1	127

Description: SW.X represents the corresponding switch bit of DIP switch SW.