

# **CWT-BK-0404R-2AI-2AO-S**

# **CWT-BK-0404T-2AI-2AO-S**

## **Modbus I O Module**

## **manual**



## 1 OVERVIEW

Options:

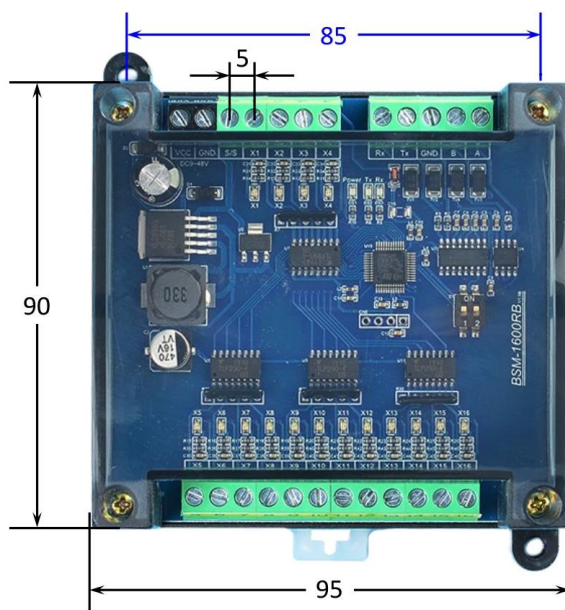
Model	IO Port	Communication Port	Protocol
CWT-BK-0404R-2AI-2AO-S	4DI+4DO (relay)+2AI+2AO	RS485+RS232	Modbus RTU
CWT-BK-0404T-2AI-2AO-S	4DI+4DO (transistor)+2AI+2AO	RS485+RS232	Modbus RTU

### 1.1 Basic Parameter

Power	DC9-48V
Protection	IP20
Installation	DIN rail mounting or screw fixing
Working Environment	-40°C ~ 70°C, 5% ~ 85%RH(non-condensing)

## 2 INSTALL

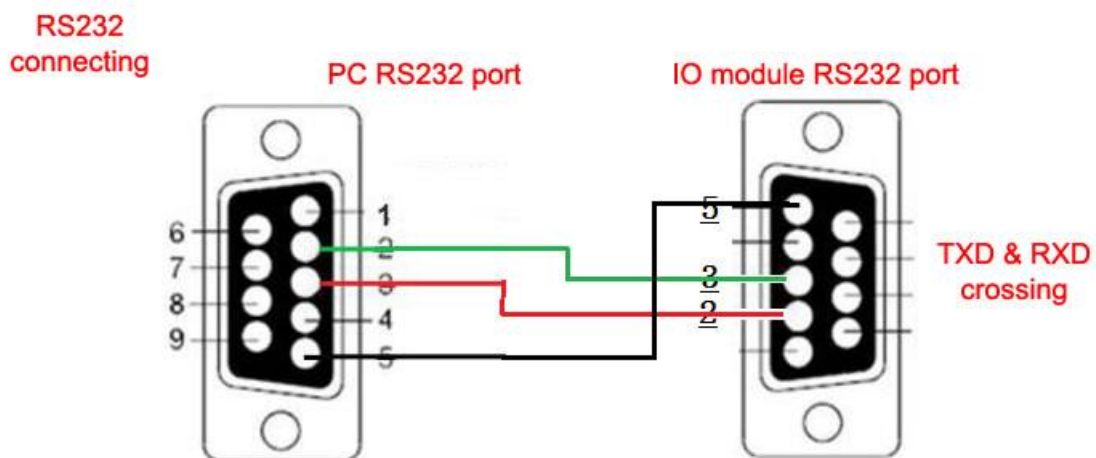
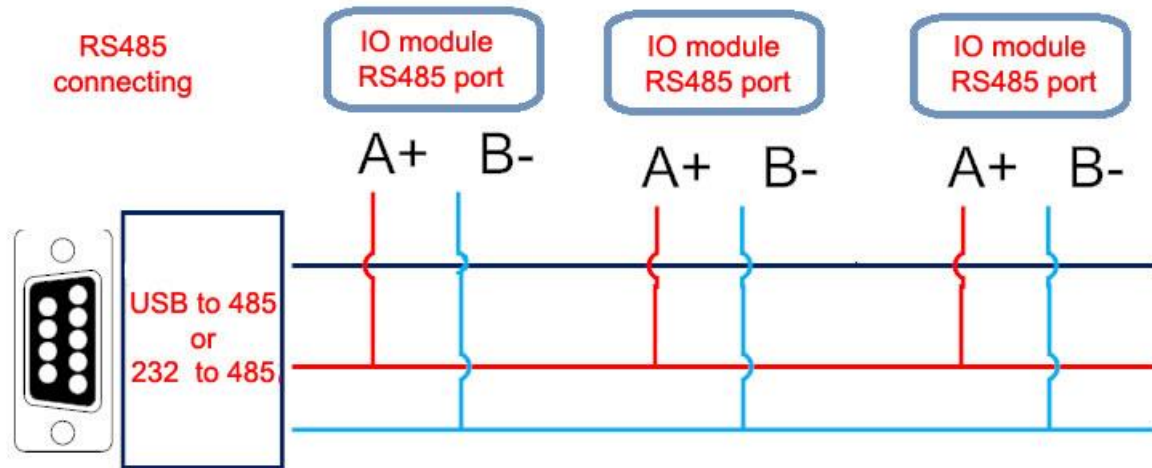
### 2.1 size



### 3 COMMUNICATION PORT

#### 3.1 RS232/RS485

Port type	1RS485 & 1RS232
Baud rate	1200 ~ 115200, default 9600
Parity	Even, Odd, None
start bit	1 bit
data bits	8 bit
Stopbits	1,2bits
Protocol	MODBUS RTU
default	9600.N.8.1, slave id is 1
Response time	15ms (9600bps), 3ms (115200bps)

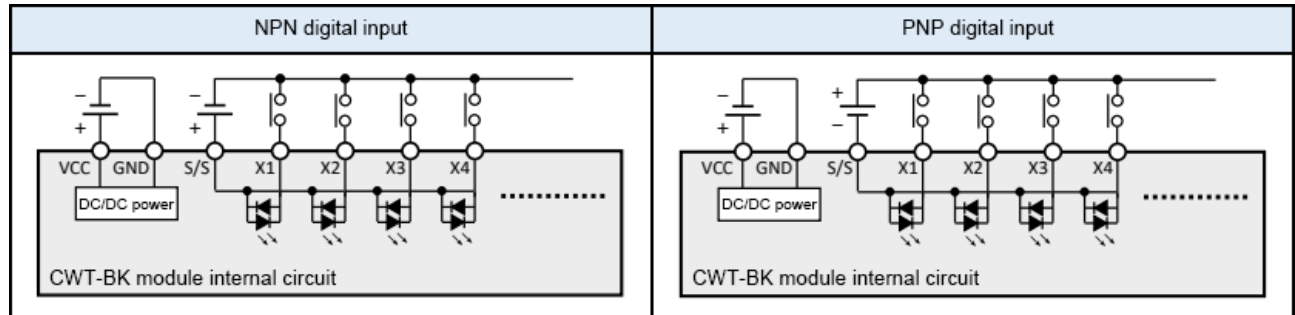


## 4 IO PORT

### 4.1 Digital input

ON signal level	9-24VD
OFF signal level	0-9VDC

#### DI wiring diagram

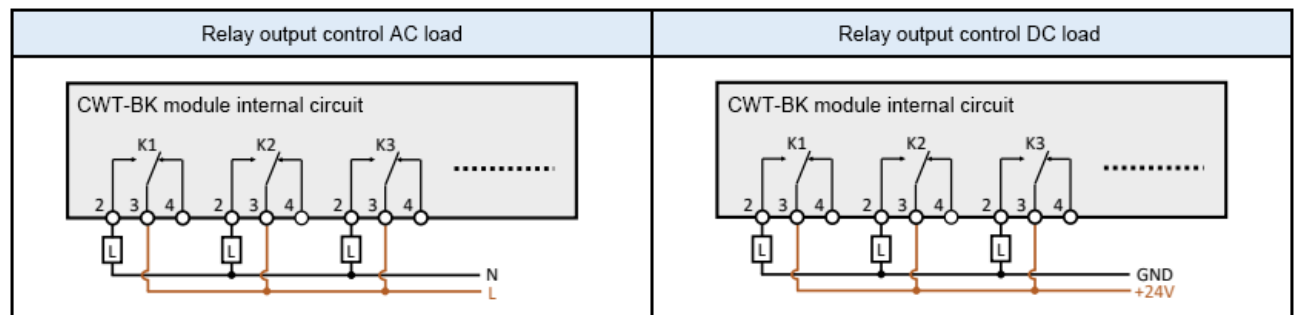


### 4.2 Digital output

#### Digital output (relay)

Output type	Relay (NO)
Load current	2A
Response time	<20ms

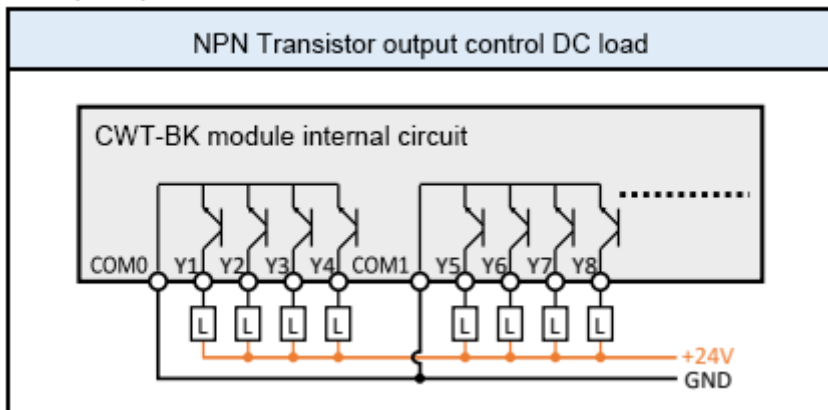
#### wiring diagram



#### Digital output (Transistor)

Output type	NPN transistor output
Load current	500mA
Response time	<5ms

## wiring diagram



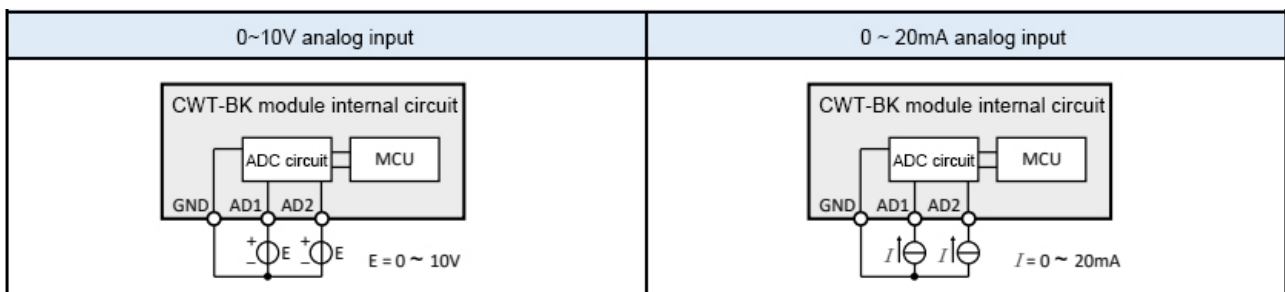
## 4.3 Analog input

Input type	0 ~ 20mA or 0 ~ 10V
Precision	0.1%, 12 bit

**0-20mA input is default, can set 0-10V input by jump wire**

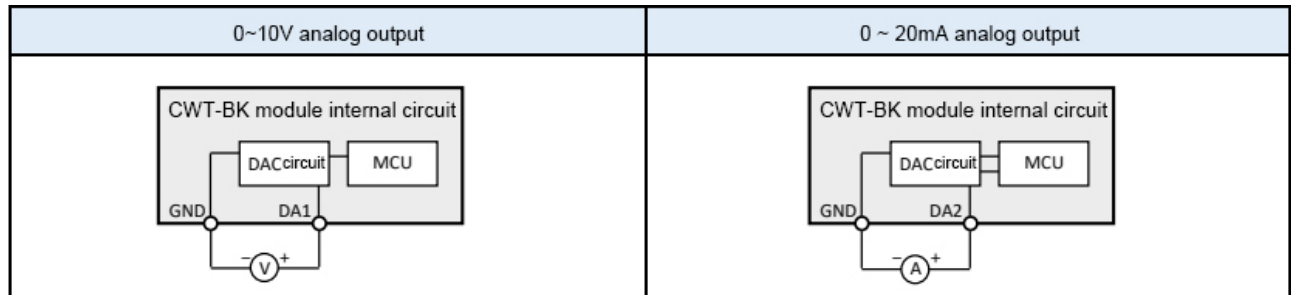


## wiring diagram



## 4.4 Analog output

Output type	<b>channel 0 is 0-10V output, channel 1 is 0-20mA output</b>
Precision	0.1%, 12 bit



## 5 MODBUS REGISTER MAP

Parameters	PLC address	Function code	Format	Content	Read/Write
Slave ID	40001	03/06	UINT16	1~255	R/W
Status bit	40002	03/06	UINT16	Bit0: RS232 communication Bit1: RS485 commnnication	R/W
Baud	40003	03/06	UINT16	48: 4800bps 96: 9600bps 192: 19200bps 1152: 115200bps	R/W
Parity	40004	03/06	UINT16	0: none 1: even 2: odd	R/W

IO Port	Register address (hex)	PLC address	Function code	Format	Read/Write
Di0 ~ Di3	0000 ~ 0003	10001~10004	02	UINT16	R
Do0 ~ Do3	0000 ~ 0003	00001~00004	01/05	UINT16	R/W
Ai0 ~ Ai1	0000 ~ 0001	30001~30002	04	UINT16	R
Ao0~ Ao1	01F4 ~ 01F5	40501~40502	06	UINT16	R/W

IO port	Register value	meaning
DI	0	off
	1	on
Do	0	off
	1	on
Ai	0-4000	corresponds to 4-20mA
		corresponds to 0-10V
Ao	0-4000	corresponds to 0-20mA
		corresponds to 0-10V

**How to convert mA or V to physical value**

AI is 0-20mA

physical value= $((P_{max}-P_{min})/4000)*(register\ value)+P_{min}$

AI is 0-10V

physical value= $((P_{max}-P_{min})/10)*(register\ value)+P_{min}$

E.g., if AI connect a 4-20mA temperature sensor, measuring range is 0-100 degree

4mA corresponds to register value is 800

20mA corresponds to register value is 4000

Current register value is 2000

Current temperature value=  $((100-0)/(4000-800))*(2000-800)+0 = 37.5$  degree