AC dimming module user manual
(Support 485, analog, potentiometer, button dimming)

Brand：Huaqingjun

Manufacturer：Foshan Qingjun Electronics Co., Ltd.

Place of origin: Foshan, Guangdong (Third Floor, Block B, Chaofa Creative Park, No. 2 Lianhe Avenue, Nanhai District, Foshan City, Guangdong Province)

Specifications and models: 4 channels

一、Hardware Parameters

1.1: Message from the engineer：

The dimming module is only suitable for controlling single-phase AC load power; it is based on SCR dimming (chopping control) and can be widely used to control the following objects：

Incandescent lamp；

AC fan；

AC draught Fan;

Heating tube, etc.；

Not applicable: energy-saving lamps with ballasts；

1.2: Power supply requirements parameters (reference value)

Working voltage: default AC220V (AC110V~250V)

Frequency: Default 50hz (20~100hz adaptive)

Output current: 10A (each channel) 20A (4 channels of full output, built-in each 2 channels share a 10A insurance)

1.3: Communication circuit parameters

Hardware interface: RS485/RS422

Whether to isolate: fully isolated

Isolation voltage: ±1500V

Communication protocol: Modbus-RTU, Modbus-TCP

Baud rate: 1200/2400/4800/9600/19200/38400/57600/115200BPS

Data format: 1 start bit, 8 data bits, parity stop bit: 1/2

Maximum number of nodes: 1 host + 31 submodules sharing bus

Maximum transmission distance: >1000 meters (two sets of independent twisted pair cables)

Shielded terminal: support

Output indicator light：

The output indicator light only exists near the output circuit. Each channel will have an output indicator light. When the channel has an output voltage, the indicator light will be lit, otherwise it will go off.

System indicator light：

1: There are 3 system indicators (“Power indicator", "Communication indicator", "timeout indicator")

2: Built-in 4 red LED indicators; used for channel selection indication when button dimming or potentiometer dimming

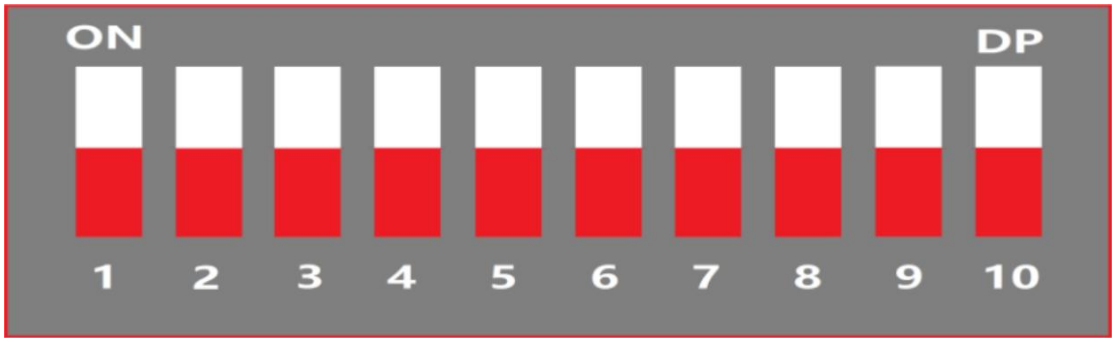
二、Setting of Communication Ways

2.1: Dial code switch

In order to make the operation easier, we have retained a 10-digit red dial switch on the board，

Used to configure the baud rate, verification method, and Modbus hardware address of the module with RS422.

Reminder: For all products with dip switches of the company, if you need to use 485 communication, you must configure the gear of the dip switch before using it for the first time. After each adjustment of the dip switch, its settings will take effect the next time it is re-powered on.



2.2：Parity setting

Data verification of communication port	S1	S2
No verification 1 stop byte	0FF	OFF
No verification 2 stop bytes	0FF	ON
Odd verification 1 stop byte	ON	0FF
Even verification 1 stop byte	ON	ON

2.3：Baud rate setting

Baud rate options	S3	S4	S5
1200	OFF	OFF	OFF
2400	OFF	OFF	ON
4800	OFF	ON	OFF
9600	OFF	ON	ON
19200	ON	OFF	OFF
38400	ON	OFF	ON
57600	ON	ON	OFF
115200	ON	ON	ON

2.4：Module address setting

Station number setting	S6	S7	S8	S9	S10
0	OFF	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	OFF	ON
2	OFF	OFF	OFF	ON	OFF
3	OFF	OFF	OFF	ON	ON
4	OFF	OFF	ON	OFF	OFF
5	OFF	OFF	ON	OFF	ON
6	OFF	OFF	ON	ON	OFF
7	OFF	OFF	ON	ON	ON
8	OFF	ON	OFF	OFF	OFF
9	OFF	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON	OFF
11	OFF	ON	OFF	ON	ON
12	OFF	ON	ON	OFF	OFF
13	OFF	ON	ON	OFF	ON
14	OFF	ON	ON	ON	OFF
15	OFF	ON	ON	ON	ON
16	ON	OFF	OFF	OFF	OFF
17	ON	OFF	OFF	OFF	ON
18	ON	OFF	OFF	ON	OFF
29	ON	OFF	OFF	ON	ON
20	ON	OFF	ON	OFF	OFF
21	ON	OFF	ON	OFF	ON
22	ON	OFF	ON	ON	OFF
23	ON	OFF	ON	ON	ON
24	ON	ON	OFF	OFF	OFF
25	ON	ON	OFF	OFF	ON
26	ON	ON	OFF	ON	OFF
27	ON	ON	OFF	ON	ON
28	ON	ON	ON	OFF	OFF
29	ON	ON	ON	OFF	ON
30	ON	ON	ON	ON	OFF
31	ON	ON	ON	ON	ON

三、Register Information

3.1：Register information for the output of the following 16 relays

Number of channel	Modbus register address hexadecimal	Siemens PLC address	Register control coil	Supported function codes
Channel 1	0x0009	40010	Data range 0~100 (power-off memory) (Corresponding to 0~100% brightness respectively)	03 06 16
Channel 2	0x000A	40011		
Channel 3	0x000B	40012		
Channel 4	0x000C	40013		

四、RS485 Modbus-RTU function code example

4.1：Modbus-RTU brief description of the working principle

The Modbus-RTU protocol uses the query+response communication mode.The master device sends a request packet to the slave device at the specified address, which contains the operation that the master requires the slave to perform and the additional information required to complete the operation.

After the selected slave station receives the request packet, it performs the operation specified in the packet, and returns a response packet based on the execution result.If the operation is successful, it responds to normal packets; if an error occurs during execution, it responds to error packets.

The master station then judges the result of the slave operation based on the slave response packet to perform the next step.

4.2：Modbus-RTU function code

Function code	Object	Function	Attribute
03	Hold register	Read multiple hold registers	Read
06	Hold register	Write a single hold register	Write
16	Hold register	Write multiple hold registers	Write

4.3 Function code example：

4.3.1：03 Code read the output ratio of the hold-type register (output channel)

Note: Non-existent hold registers or discrete registers cannot be read, otherwise the module will respond with an error message.

1）Master request message

Example: Query the output value of output channel 1：

Demand contents	Length	Scope	Example
Sub-station address	1 byte	0x00～0x1F	0x01
Function code	1 byte	0x03	0x03
Initial address	2 bytes	0x0000～0x000F	0x0009
Input quantity	2 bytes	0x0001～0x0010	0x0001
CRC verification	2 bytes	0x0000～0xFFFF	0x5408

2）The slave responds to the message normally

Demand contents	Length	Scope	Example
Sub-station address	1 byte	0x00～0x1F	0x01
Function code	1 byte	0x03	0x03
Number of valid	1 byte	N	0x02
Input status	N byte		0x0032
CRC verification	2 bytes	0x0000～0xFFFF	0x3991

Explanation: The output ratio of channel 1 is 0x0032, which is: 50%

3）Slave exception response message

Demand	Length	Scope	Example
Sub-station	1 byte	0x00～0x1F	0x01
Function	1 byte	0x83	0x83
Error code	1 byte	0x01（not a supported function code）	0x01
		0x02（the initial address is out the range of	
		0x03（the register quantity is beyond the	
		0x04（data checking error）	
CRC	2 bytes	0x0000～0xFFFF	0x80F0

4.3.2：06 code write a single hold register (set the output channel ratio)

Note: The hold register specified in the request message must exist and be writable, otherwise the module will respond with an error message.

1) Master request message

Example: Set the output ratio of output channel 1 to 50%

Demand contents	Length	Scope	Example
Sub-station address	1 byte	0x00～0x1F	0x01
Function code	1 byte	0x06	0x06
Initial address	2 bytes	0x0000～0x000F	0x0009
Register value	2 bytes	0x0000～0xFFFF	0x0032
CRC verification	2 bytes	0x0000～0xFFFF	0xD81D

2）The slave responds to the message normally

Demand contents	Length	Scope	Example
Sub-station address	1 byte	0x00～0x1F	0x01
Function code	1 byte	0x06	0x06
Initial address	2 bytes	0x0000～0x000F	0x0009
Register value	2 bytes	0x0000～0xFFFF	0x0032
CRC verification	2 bytes	0x0000～0xFFFF	0xD81D

3）Slave exception response message

Demand	Length	Scope	Example
Sub-station	1 byte	0x00～0x1F	0x01
Function	1 byte	0x86	0x86
Error code	1 byte	0x01（not a supported function code）	0x01
		0x02（the initial address is out the range of	
		0x03（the register quantity is beyond the	
		0x04（data checking error）	
CRC	2 bytes	0x0000～0xFFFF	0x830A

4.3.3：16-code write multiple hold-type registers

Note: The register specified in the request message must exist and be writable, otherwise the module will respond with an error message.

1) Master request message

Example: Configure channel 1=20% Channel 2=50% channel 3=80% channel 4=100%

Demand contents	Length	Scope	Example
Sub-station address	1 byte	0x00～0x1F	0x01
Function code	1 byte	0x10	0x10
Initial address	2 bytes	0x7530	0x0009
Register value	2 bytes	N	0x0004
Byte quantity	1 byte	2*N	0x08
Register value	2*N byte		0x0014, 0x0032
			0x0050, 0x0064
CRC verification	2 bytes	0x0000～0xFFFF	0xC659

Note 1: The value of N must be an even number greater than 0 such as 2, 4, 6, 8, etc.

2）The slave responds to the message normally

Demand contents	Length	Scope	Example
Sub-station address	1 byte	0x00～0x1F	0x01
Function code	1 byte	0x10	0x10
Initial address	2 bytes	0x7530	0x0009
Register value	2 bytes	N	0x0004
CRC verification	2 bytes	0x0000～0xFFFF	0x11C8

3）Slave exception response message

Demand	Length	Scope	Exampl
Sub-station	1 byte	0x00～0x1F	0x01
Function	1 byte	0x90	0x90
Error code	1 byte	0x01（not a supported function code）	0x01
		0x02（the initial address is out the range of	
		0x03（the register quantity is beyond the	
		0x04（data checking error）	
CRC	2 bytes	0x0000～0xFFFF	0x8DC0

The above example is only to show the differences between the MODBUS-RTU protocol and the MODBUS-TCP protocol. Other function codes can be implemented in this format.

Tip: If you are using a PLC or an intelligent terminal that supports MODBUS-TCP (such as a touch screen), the user does not need to understand the content of the protocol, because this is the work done automatically by the PLC. The user only needs to set up the communication port of the PLC and change the register address that needs to be operated to automatically complete the communication.

5. Button dimming method

Connect a button between the terminal GND and the terminal "CH" 1

Connect a button between the terminal GND and the terminal "plus" 2

Connect a button between the terminal GND and the terminal "minus" 3

1: Each time you press the button 1; the 4 channel indicators will be lit in turns, and the channel that is lit in the test can be dimmed.；

2: After selecting the output channel, press button 2 or button 3 to adjust the output ratio by 10% each time.；

Note: If there is no operation within 5 seconds after selecting the channel, the dimming mode will be automatically exited and the current output ratio will be remembered.

6. Potentiometer dimming method

Connect a button between the terminal GND and the terminal "CH" 1

The three terminals of RP + / AD / RP-are connected to the left, middle and right feet of the 10K potentiometer.

1: Each time you press the button 1; the 4 channel indicators will be lit in turns, and the channel that is lit in the test can be dimmed.;

2: After selecting the output channel, twist the potentiometer to adjust the output ratio of the selected output channel;

Note: If there is no operation within 5 seconds after selecting the channel, the dimming mode will be automatically exited and the current output ratio will be remembered.

7. 0~5V dimming method

The terminal GND is connected to the GND of the external analog signal (0~5V);

The terminal AD is connected to the signal pin of the external analog signal (0~5V);

1: Each time you press the button 1; the 4 channel indicators will be lit in turns, and the channel that is lit in the test can be dimmed.;

2: After selecting the output channel, modify the voltage of the AD port to adjust the output ratio of the selected output channel.;

Note: If there is no operation within 5 seconds after selecting the channel, the dimming mode will be automatically exited and the current output ratio will be remembered.

The demos of all brands of PLCs and configuration software of touch screens and the solutions are available in our company. Please contact us without hesitation if you want to know more details about the products.

Foshan Qingjun Electronics Co., Ltd.
Address：Room 307, the 3rd floor, Building B, Chaofa Chuangyi Park, 2# Lianhe Road, Nanhai District, Foshan city, Guangdong, China
Phone number: +86 17708670771
Tel：（86）0757 81809248
Company website：fsqjkj.en.alibaba.com