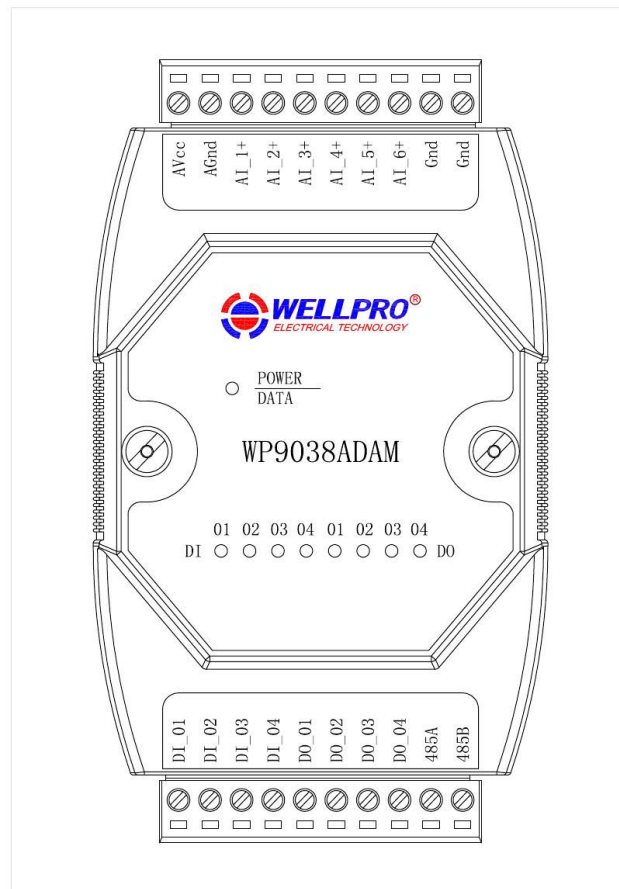


WP9038ADAM

User's Manual

Version 1.42



Shanghai Wellpro Electrical Technology Co., Ltd.
www.shwellpro.com

1、Product description

- 6 ch single terminal analog input (DC 0-20mA/4-20mA),using independent 12 bit industrial AD collection chip
- 4 ch optoelectronic isolation digital input and output (NPN transistor open collector output)
- Using RS485 MODBUS RTU communication standard. It can be netted with configuration software, PLC and industry touch pad
- Communication, input and output status LED
- Communication circuit designed for lightening protection and interference immunity
- Could be used for signal collection and control of Industrial field apparatus
- 3 Year's quality assurance for normal use

2、Specification

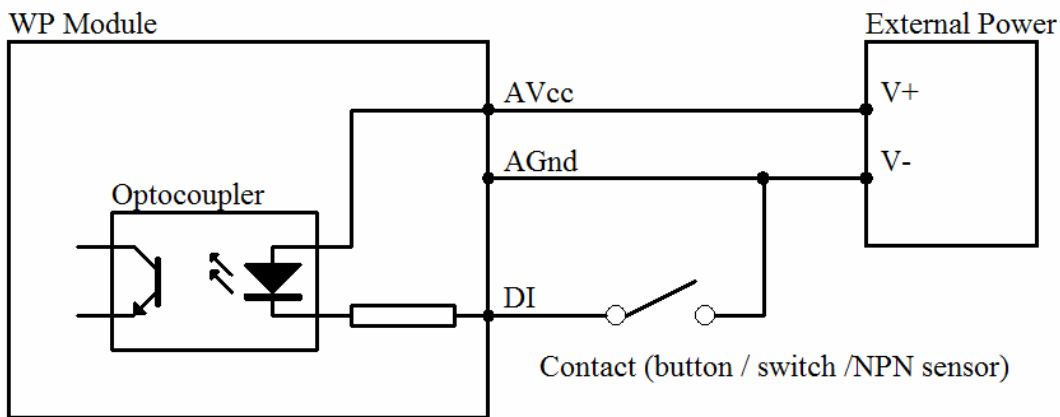
- Analog input channel 6 ch single terminal
- Analog input type DC 0-20mA/4-20mA
- Analog input accuracy $\pm 0.02\text{mA}$
- Digital input channel 4 ch (active low)
- Digital output channel 4 ch (NPN transistor open collector output, 500mA)
- Working Temperature $-20\sim 70^{\circ}\text{C}$
- External power supply DC 9V \sim 30V/2W
- Isolation protect 1500VDC
- Installation method Standard DIN slide rail or screw
- Dimension 125 \times 73 \times 35mm

3、Interface definition

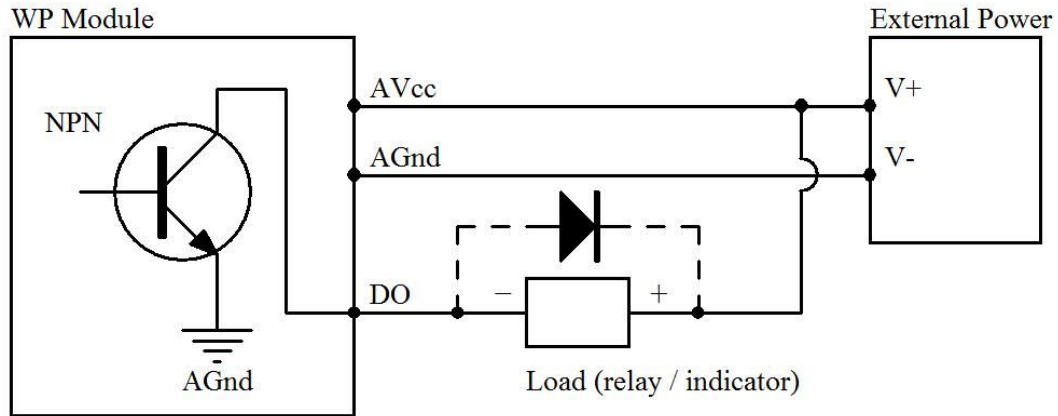
AVcc	External PSU positive terminal input
AGnd	External PSU negative terminal input
AI 1+	Positive terminal of 1 st analog input
AI 2+	Positive terminal of 2 nd analog input
AI 3+	Positive terminal of 3 rd analog input
AI 4+	Positive terminal of 4 th analog input
AI 5+	Positive terminal of 5 th analog input
AI 6+	Positive terminal of 6 th analog input
Gnd	signal ground, connect to negative terminal of analog input
Gnd	signal ground, connect to negative terminal of analog input
DI_01	1 st digital input
DI_02	2 nd digital input
DI_03	3 rd digital input
DI_04	4 th digital input
DO 01	1 st digital output
DO 02	2 nd digital output
DO 03	3 rd digital output
DO 04	4 th digital output
485A	RS485 signal A+
485B	RS485 signal B-

4、Digital/analog application diagram

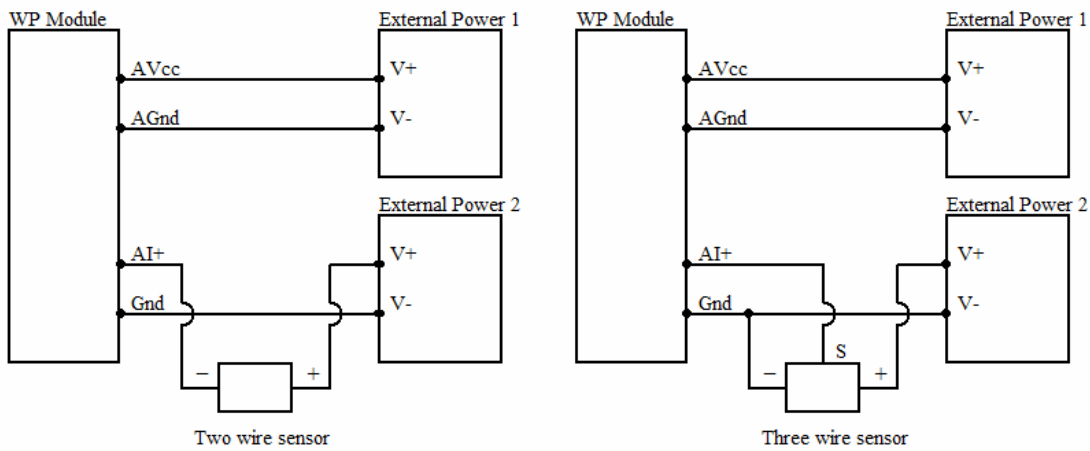
4.1、digital input diagram



4.2、digital output diagram



4.3、analog input diagram



5、Communication Instruction

5.1、Communication parameter (default setting): 9600, N, 8, 1

Parameter	Description
9600	baud rate
N(no check)	check bit
8	data bit
1	stop bit

5.2、Command for collecting the input signal of analog quantity:

Send: 01 03 00 00 00 06 C5 C8 (example/hexadecimal)

data	byte	data description	remark
01	1	module address	address range:01-FE
03	1	function code	03-read register
0000	2	register address (4x mode)	0000-analog input address of first register
0006	2	reading length	0006-read 6 registers
C5C8	2	CRC check code	CRC check code for all data

Receive: 01 03 0C 07 69 00 00 00 00 00 00 00 00 00 B6 26 (example/hexadecimal)

data	byte	data description	remark
01	1	module address	address range:01-FE
03	1	function code	03-read register
0C	1	byte numbers	0C-read 12 bytes

0769	16	read data	0769-read data from the first analog input
0000			0000-read data from the second analog input
0000			0000-read data from the third analog input
0000			0000-read data from the fourth analog input
0000			0000-read data from the fifth analog input
0000			0000-read data from the sixth analog input
B626	2	CRC check code	CRC check code for all data

The received command means the data of the first analog input is “0769”, and it is equal to 1897 in decimal, then substitute into the formula: $I=(DATA*20)/4095=(1897*20)/4095\approx 9.26mA$. The current in the other channel is 0mA.

5.3、Command for digital input collection:

Send: 01 02 00 00 00 04 79 C9 (example/hexadecimal)

data	byte	data description	remark
01	1	module address	Address range 01-FE
02	1	function code	02-read input bit
0000	2	input address(1x mode)	0000-initial address of input bit
0004	2	read length of input bit	0004-read 4 input bits
79C9	2	CRC check code	CRC check code for all data

Receive: 01 02 01 05 61 8B (example/hexadecimal)

data	byte	data description	remark
01	1	module address	Address range 01-FE
02	1	function code	02-read input bit
01	1	byte numbers	01-read one byte length
05	1	read data	05-read input bit status
618B	2	CRC check code	CRC check code for all data

Converting reading data “05” to 2 hexadecimal results “00000101”, last 4 numbers are active. From left to right, it represents the 4 digital input channel status DI_04~ DI_01. Here it means DI_03、DI_01 have input but others no.

5.4、Command for digital output (several controls):

Send: 01 0F 00 00 00 04 01 03 7E 97 (example/hexadecimal)

data	byte	data description	remark
01	1	module address	Address range 01-FE
0F	1	function code	0F-write multiple coil
0000	2	coil address(0x mode)	0000-initial address of coil
0004	2	write coil length	0004-write 4 coils
01	1	write data byte	01-write one byte data
03	2	data writing	03-write output state of 4 coil
7E97	2	CRC check code	CRC check code for all data

Receive: 01 0F 00 00 00 04 54 08 (example/hexadecimal)

Converting reading data “03” to 2 hexadecimal results “0000 0011”, last 4 numbers are active. From left to right, it represents the 4 digital output channel status DI_04 ~ DI_01. Here it means DO_02、DO_01 have output but others no. When module receives correct command, it will make corresponding actions and send response back to the master. This is successful communication.

5.5、Command for digital output (single control):

Send: 01 05 00 00 FF 00 8C 3A (example/hexadecimal)

data	byte	data description	remark
01	1	module address	Address range 01-FE
05	1	function code	05-write single coil
0000	2	coil address(0x mode)	0000-digital output(DO_01)coil address 0001-digital output(DO_02)coil address 0002-digital output(DO_03)coil address 0003-digital output(DO_04)coil address
FF00	2	data writing	FF00-coil open, 0000-coil close
8C3A	2	CRC check code	CRC check code for all data

Receive: 01 05 00 00 FF 00 8C 3A (example/hexadecimal)

When module receives correct command, it will make corresponding actions and send response back to the master. This is successful communication.

5.6、Command for state collection of digital output:

Send: 01 01 00 00 00 04 3D C9 (example/hexadecimal)

data	byte	data description	remark
01	1	module address	Address range 01-FE
01	1	function code	01-read coil state
0000	2	coil address(0x mode)	0000-initial address of coil
0004	2	read coil length	0004-read 4 coils state
3DC9	2	CRC check code	CRC check code for all data

Receive: 01 01 01 03 11 89 (example/hexadecimal)

data	byte	data description	remark
01	1	module address	Address range 01-FE
01	1	function code	01-read coil state
01	1	byte numbers	01-read one byte data
03	1	read data	03-read coil state
1189	2	CRC check code	RC check code for all data

Converting reading data “03” to 2 hexadecimal results “0000 0011”. From left to right, it represents the 4 digital output channel status DI_04 ~ DI_01. Here it means DO_02、DO_01 have output but others no.

5.7、command for module address setting:

Send: 00 06 00 64 00 01 08 04 (example/hexadecimal)

date	byte	data description	remark
00	1	module address	00-group sending
06	1	function code	06-write single register
0064	2	register address (4x mode)	0064-modify module address
0001	2	data writing	set new address for module, range 0001-00FE
0804	2	CRC check code	CRC check code for all data

Receive: 00 06 00 64 00 01 08 04 (example/hexadecimal)

This command means to send a code to a module, set the module address as 01, this setting could be saved when power off; default address of module is 01,each module address could be assigned separately when using multiple modules for network. Attentions is required that only one module could be used in 485 network when using multiple address sending, otherwise all the modules will share the same address in 485 network. When module receives correct command, it will make corresponding actions and send response back to the master. This is successful communication.

5.8、Command for communication parameter setting:

Send: 01 06 00 65 00 02 18 14 (example/hexadecimal)

data	byte	data description	remark
01	1	module address	address range:01-FE
06	1	function code	06-write single register
0065	2	register address (4x mode)	0065-modify communication parameter
0002	2	data writing	0001-set communication parameter 4800,N(no check) ,8,1 0002-set communication parameter 9600,N(no check) ,8,1 0003-set communication parameter 19200,N(no check) ,8,1 0004-set communication parameter 38400,N(no check) ,8,1 0005-set communication parameter 4800,E(even check) ,8,1 0006-set communication parameter 9600,E(even check) ,8,1 0007-set communication parameter 19200,E(even check) ,8,1 0008-set communication parameter 38400,E(even check) ,8,1
1814	2	CRC check code	CRC check code for all data

Receive: 01 06 00 65 00 02 18 14 (example/hexadecimal)

This command means to send a code to the module and set the communication parameter as “9600, N (No check), 8, 1”. This setting could be saved when power off. The default communication parameter is “9600, N (no check), 8, 1”. Attention is required, when electing the correct communication parameter in communication setting and restarting the communication terminal, setting will be done. Normally, the lower of baud rate, the lower of the transaction speed but the higher of transaction stability. The opposite is also true. When module receives correct command, corresponding action will be taken and response will be sent back to the master. This is successful communication.

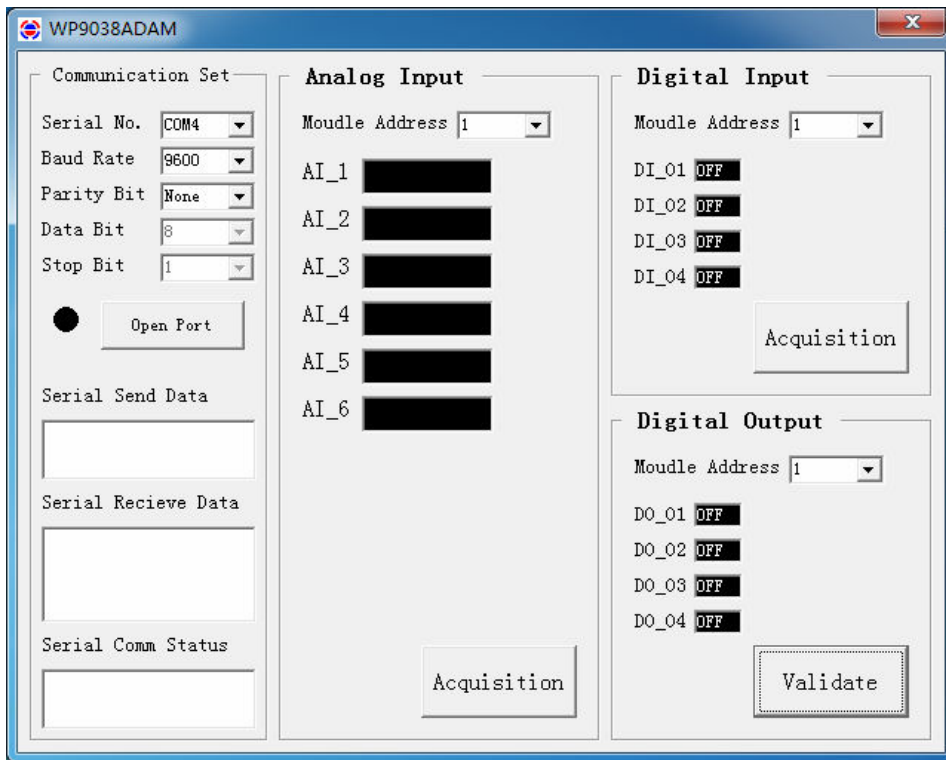
6、Indicator LED description

- When module powered on, Led is green.
- When module is under communication, LED is twinkling.
- when module receive correct command, LED is green.
- when module receive incorrect command or command for other modules, LED is red.

7、PC debugging instruction

This module provides software for parameter setting and function test. Please follow the steps below:

- Connect the module and computer using RS485 converter.
- Connect 12V or 24V power with module and power on. **To avoid any unnecessary damage, please make sure the power positive & negative terminals are correctly connected before power on.**
- Open the software, select the correct module number, you will see the window of function test or parameter setting.
- Set correct parameter, open communication interface.
- Select corresponding setting, collection and control items.



8、RS485 network diagram

