

# SM1250B



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## 16-way switchgear acquisition module

### Product Overview

SM1250B switch signal acquisition module is based on industrial MODBUS-RTU protocol is the actual demand for the design and production of various industrial field, set the collection, processing, and other functions in a new industrialization module.

In order to facilitate networking and industrial applications, the module uses MODBUS-RTU communication protocol widely used in industry to support secondary development, and provide random testing and secondary development of software. Users only need to use any serial communication software module data query and set according to our protocol.

### Parameters

Name	Parameter values
Input	16 way
Baud Rate	Default 9600,8, n, 1
Communication port	RS485
Power supply	Bus-powered, DC6-24V 1A
Power Consumption	<1W
Input Isolation	3000V
Storage Temperature	-40 – 85°C
Operating Environment:	-40 – 85°C
Dimensions	122×71×26mm <sup>3</sup>

### Main features:

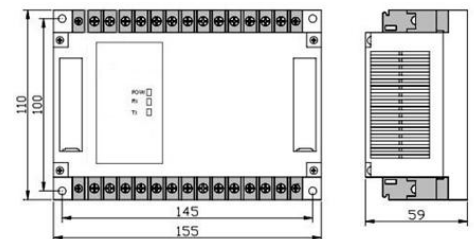
- 16 digital inputs (dry contact or wet contact anode)
- Input High: +5 V ~ +12 V
- Input Low: 0 ~ +1 V
- RS485 and dual-input isolation, high voltage isolation voltage: 2500V
- Device address can be changed;
- Based on MODBUS-RTU protocol can be connected directly to a PLC or configuration software;
- Supports baud query and change;



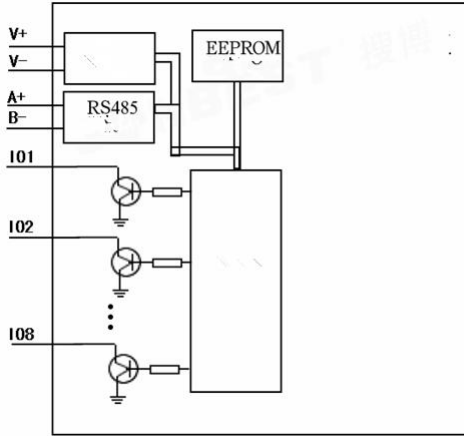
### ORDERING INFORMATION

Type	Order No.	Interface
SM1250B	SM1250B	RS485

### Dimensions



## Internal schematic



As shown above, SM1250B internally by the power manager, RS485 controller, EEPROM memory, embedded controllers, switch input circuit. Equipment using the standard MODBUS-RTU protocol, you can point directly to the switch control registers and status queries.

### Indicator

Equipment designed three lights, each function is as follows:

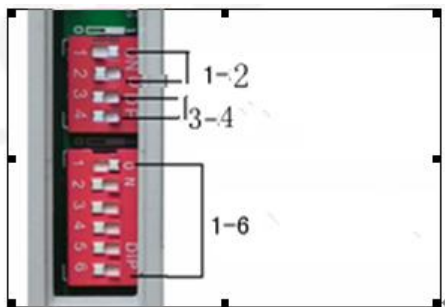
PWD - the power indicator, which lights after power is on.

RX - receive data indicator when communicating

Transmit Data indicator TX-communication

The left side of the terminal block pin definitions

After the front of the device from the left cover open, as shown below, on the left pin port is set manufacturers, two buttons on the right side of the sensor calibration button. The following two switches, each switch is set to the baud rate and device address.



### Communication baud rate setting

The equipment for the RS485 interface, while paragraph 4 S2

is not enabled, you can pull to the 0 position. The baud rate is set by DIP switch S2 to achieve the first three segments, as shown at right, DIP switch to "ON" means "1", pull to the side of said digital "0", representing the following meaning:

DIP switch S2			Baud Rate (bps)
Section 3	Section 2	Section 1	
0	0	0	19200
0	0	1	9600
0	1	0	4800

The default baud rate is 9600, the location as shown on the right. You must restart your device (power) new communication baud rate setting to be able to take effect

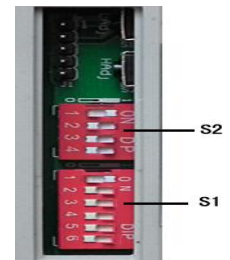
### Device address set

In the application, sometimes need to use multi-machine networking, networking devices in the address can not be the same, so the user changes the device address, the address range is 1-63. Change the device address of the device is via DIP switch S1 to achieve. DIP switch to "ON" means "1", off the system in the following table 1-6 DIP switch S1 segment and the address shown below:

DIP switch S1						Device Address
Section 6	Section 5	Section 4	Section 3	Section 2	Section 1	
0	0	0	0	0	1	1
0	0	0	0	1	0	2
0	0	0	0	1	0	3
...	...	...	...	...	...	...
1	1	1	1	1	1	63

The default device address is 1, DIP position as shown above.

Note: You must restart the new device address setting device (power) to enter into force



### Power Interface

Device power supply interfaces for the two core green connectors. Power supply equipment for DC6-24V, the maximum voltage must not exceed 24V, the minimum voltage is not less than 5.5V, recommended the use of DC9V 1A power when used alone, if the sensors are more and longer lead time, we recommend using the 2A-3A the DC9V power. Long-range multi-machine communication, it is recommended to use DC12 2A above

**monolithic power.**

Symbol	Name	Explanation
V+	Positive power supply.	DC6-24V positive supply
V-	Negative power supply	DC6-24V negative supply

**Communication Interface**

Symbol	Name	Explanation
GND	RS232 ground wire	This equipment is not used
RX	RS232 receiver	This equipment is not used
TX	RS232 transmit	This equipment is not used
B-	RS485 B+	RS485 communication interface B-
A+	RS485 A+.	RS485 communication interface A +

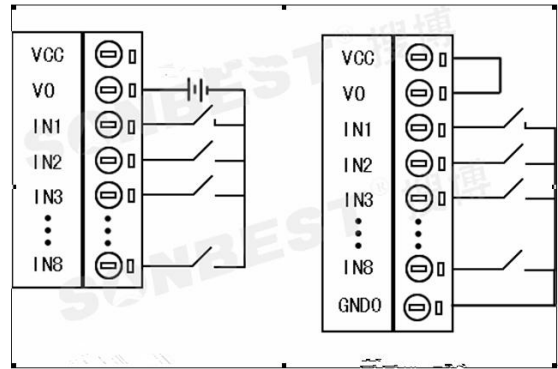
**Terminal Block**

VCC	Equipment supply pins	From the external power supply DC5V + should
V0	Users positive power supply	User equipment connected to the positive power supply to the voltage range of 3.2-12V
IN1	Signal Input 1	Dry contact or wet contact signal input pin
GND1	Signal input to a	
IN2	Signal Input 2	
GND2	Signal input to 2	
...		
IN16	Signal Input 16	
GND16	Signal input to 16	

**Wiring**

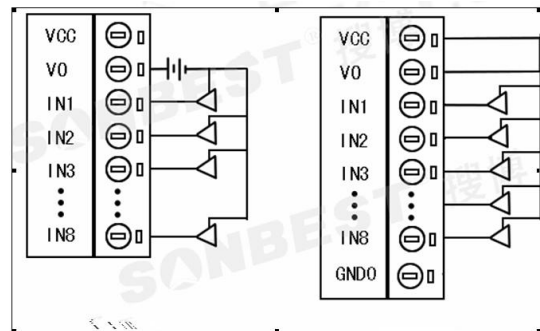
Dry contact signal input wiring

As shown, the device provides two kinds of wiring, a user with an external power supply that is connected with the dry contact, a connection with the internal power supply and dry contact device. When using the power user, we recommend using a voltage range of 5-12V.



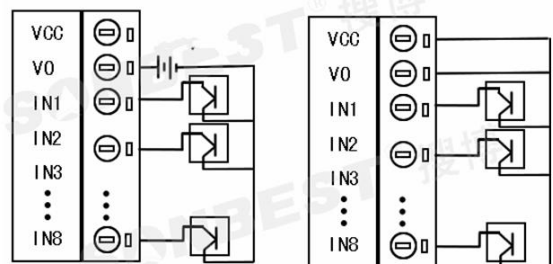
TTL / CMOS signal input wiring

As shown, the device provides two kinds of wiring ways, one with an external power supply that users An internal power supply equipment. V0 and GND0 internal equipment fully isolated power supply can directly be connected directly V0, GND0 and user power. If you do not use the power user, the device can also be used inside the power supply. VCC is internally isolated from the positive power supply, GND0 negative internal isolated power supply.



Open collector signal input

As shown, the device provides two kinds of wiring, a user with an external power supply that is, a device with an internal power supply..



Device address and baud rate inquiry

There are four kinds of equipment available to set the baud rate, respectively 4800,9600,14400,19200, default baud rate is 9600.

Device address range 1-250.

If the user does not know the device baud rate or address, can be used as a method to retrieve the device address and baud rate.

1. Need the right side of the terminal block CNG pin and GND shorted.
2. Turn on the computer serial debugging assistant, first set to the default 9600 baud, 8 data bits, no parity, 1 stop bit.
3. The device power reboot.

Each restart power supply, the device sends 4 bytes of data, of which the first two bytes of data to the device address, the 2 bytes for the device baud rate. As shown above, the two bytes of 2580, corresponding to the decimal number is 9600, indicating that the current device baud rate of 9600, the result is correct. If the data is not sent back to four decimal bytes or baud rate corresponds to a value other than "4800,9600,14400,19200" When any one of values, you can switch the baud rate serial debugging assistant tool, until the correct baud loopback so far. If the baud rate is correct, compared with the previous two-byte device correct device address.

**Communication protocol**

Switch input status inquiry (function 1)

A total of 16 devices switch input signal, corresponding 16-point register allocation table is:

Register Address	Pin label	Literacy status	Data length
0009	IN1	Read-only	1bit
0010	IN2	Read-only	1bit
0011	IN3	Read-only	1bit
0012	IN4	Read-only	1bit
0013	IN5	Read-only	1bit
0014	IN6	Read-only	1bit
0015	IN7	Read-only	1bit
0016	IN8	Read-only	1bit

Command Format

Slave Address	Function Code	Starting address	Data length	CRC code
01H	01H	0008H-000FH	0000H-0008H	CRC16

For example, a query input IN1 state value command: 01 01 00 08

00 01 7C 08

Slave Address	Function Code	Starting address	Data length	CRC code
01H	01H	0008H	0001H	7C 08H

Reply message is: 010101019048 format is as follows:

Device Address	Function Code	Data length	Data	CRC code
01H	01H	01H	01H	90 48 H

The above information in reply to a data value 01H, the binary value 0000 0001B that IN1 current state is high.

If both inquiries eight digital inputs state value, the command is:

Slave Address	Function Code	Starting address	Data length	CRC code
01H	01H	0008H	0008H	BC 0EH

Device reply message:

Device Address	Function Code	Data length	Data	CRC code
01H	01H	01H	FFH	11 C8 H

The above data recovery information is FFH, the binary value 1111 1111B that IN1-IN8 current state are high, low to IN1, high as IN8.

Switch output status inquiry (function 1)

A total of 16 devices switch input signal, corresponding 16-point register allocation table is:

Register Address	Pin label	Literacy status	Data length
0001	IO1	Read and write	1bit
0002	IO2	Read and write	1bit
0003	IO3	Read and write	1bit
0004	IO4	Read and write	1bit
0005	IO5	Read and write	1bit
0006	IO6	Read and write	1bit
0007	IO7	Read and write	1bit
0008	IO8	Read and write	1bit

Command Format

Slave Address	Function Code	Starting address	Data length	CRC code
01H	01H	0001H-0008H	0000H-0008H	CRC16

For example, a query input status value IO1 command: 01 01 00 00 00 01 FD CA

Slave Address	Function Code	Starting address	Data length	CRC code
01H	01H	0001H	0001H	FD CA

01H	01H	0000H	0001H	FD CA H
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Reply message is: 010101019048 format is as follows:

Device Address	Function Code	Data length	Data	CRC code
01H	01H	01H	01H	90 48 H

The above information in reply to a data value 01H, the binary value 0000 0001B that IO1 current state is high.

If both inquiries eight switch output state value, the command is:

Slave Address	Function Code	Starting address	Data length	CRC code
01H	01H	0000H	0008H	3DCCH

Device reply message:

Device Address	Function Code	Data length	Data	CRC code
01H	01H	01H	FF H	11 C8 H

The above data recovery information is FFH, the binary value 1111 1111B that IO1-IO8 current state are high, low for the IO1, high as IO8.

Switch output control (function 5)

Command Format

Slave Address	Function Code	Starting address	Point state value	CRC code
01H	05H	0001H-0008H	0000H or FF00H	CRC16

Point state value 0000H, set the point is low, when FF00H, set the high point.

For example, the state set IO1 high command: 01 05 00 00 FF 00 8C 3A

Command parsing:

Slave Address	Function Code	Starting address	Point state value	CRC code
01H	05H	0000H	FF00H	8C 3A H

Information and send commands to the same reply.

Set device address (Function No. 6)

Register address device address is 4x0014 which should 0DH, values range 1-250 namely 0001H-00FAH

Command Format

Slave Address	Function Code	Starting address	Value range	CRC code
01H	06H	000DH	0001-00FAH	CRC16

For example, to change the current device address is 1 to 2 orders

of: 01 06 00 0D 00 02 99 C8

Command parsing:

Slave Address	Function Code	Starting address	Point state value	CRC code
01H	06H	00 0DH	000DH	99 C8 H

Set the baud rate (function number 6)

Register address device address is 4x0013 which should 0EH, value ranges 4800,9600,14400 or 19200, the other value is invalid.

Baud rate (in decimal)	Baud Rate (hex)
4800	12C0H
9600	2580H
14400	3840H
19200	4B00H

Command Format

Slave Address	Function Code	Starting address	Value range	CRC code
01H	06H	0003H	Four elected a	CRC16

For example, to change the current device address is 19200 baud command: 01 06 00 0C 4B 00 7F 39

Command parsing:

Slave Address	Function Code	Starting address	Baud state value	CRC code
01H	06H	00 0CH	4B 00H	7F 39H

Information and send commands to the same reply.