SmartGen

MAKING CONTROL SMARTER

AIN8

ANALOG INPUT MODULE

USER MANUAL

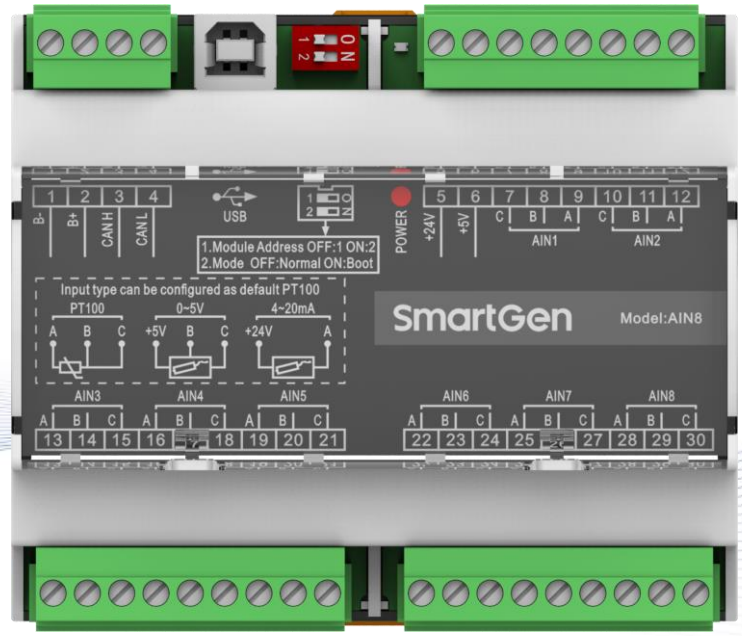

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Table 1 - Software Version

Date	Version	Content
2017-12-01	1.0	Original release.
2023-02-23	1.1	Update the manual format, information and logo of SmartGen.
2025-03-04	1.2	1. Update the figure of mask and terminal diagram of AIN8; 2. Update the baud rate description of CANBUS, add description of module address; 3. Update the technical parameters; 4. Update the description of terminal connection; 5. Update the description of protection; 6. Delete the sensor parameter setting; 7. Update the application diagram; 8. Update the figure of overall dimension.

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1 OVERVIEW

AIN8 analog input module is an expansion module which has 8 analog input channels and the PT100 resistor-type sensor input, (4~20)mA current-type sensor input or (0-5)V voltage-type sensor input can be chosen for each channel. The data collected by AIN8 are transmitted to the host controller for processing via CANBUS port. Different alarm threshold values and sensor names can be set for each sensor via host controller, if sensor meet with alarm condition, corresponding alarm information will be displayed on the host controller.

2 PERFORMANCE AND CHARACTERISTICS

- Each channel can be set as PT100 resistor-type sensor input, (4~20)mA current-type sensor input or (0-5)V voltage-type sensor input;
- User can define each channel sensor's name;
- Alarm threshold of each channel can be configured;
- Changing sensor types can be realized via software configuration, and there is no need to change hardware interface;
- AIN8 CANBUS communication baud rate can be set as 250kbps;
- Module address can be configured by DIP switch, where Switch 1 in the OFF position (12 side) corresponds to 1 and the ON position to 2;
- AIN8 must be used with the host controller;
- Widely power voltage range (8~35)VDC, which is suitable for different voltage requires of starter battery;
- Modular structure，flame retardant ABS shell, pluggable wiring terminals, guide rail mounting, compact structure and easy operation.

3 SPECIFICATION

Table 2 – Technical Parameters

Item	Content
Working Voltage	DC8.0V~35.0V continuous power supply
Overall Power Consumption	<2W
PT100 Resistor-type Input	(0-300)Ω
(0-5)V Voltage-type Input	(0-5)V
(4-20)mA Current-type Input	(0-20)mA
Case Dimension	107.6mm x 93mm x 60.7mm
Guide Rail Dimension	35mm
Working Temp.	(-25~+70)°C
Working Humidity	(20~93)%RH
Storage Temp.	(-25~+70)°C
Insulation Strength	Apply AC 2.2kV voltage between AV high and low voltage terminals, and the leakage current is not more than 3mA within 1min.
Weight	0.22kg

4 WIRE CONNECTION

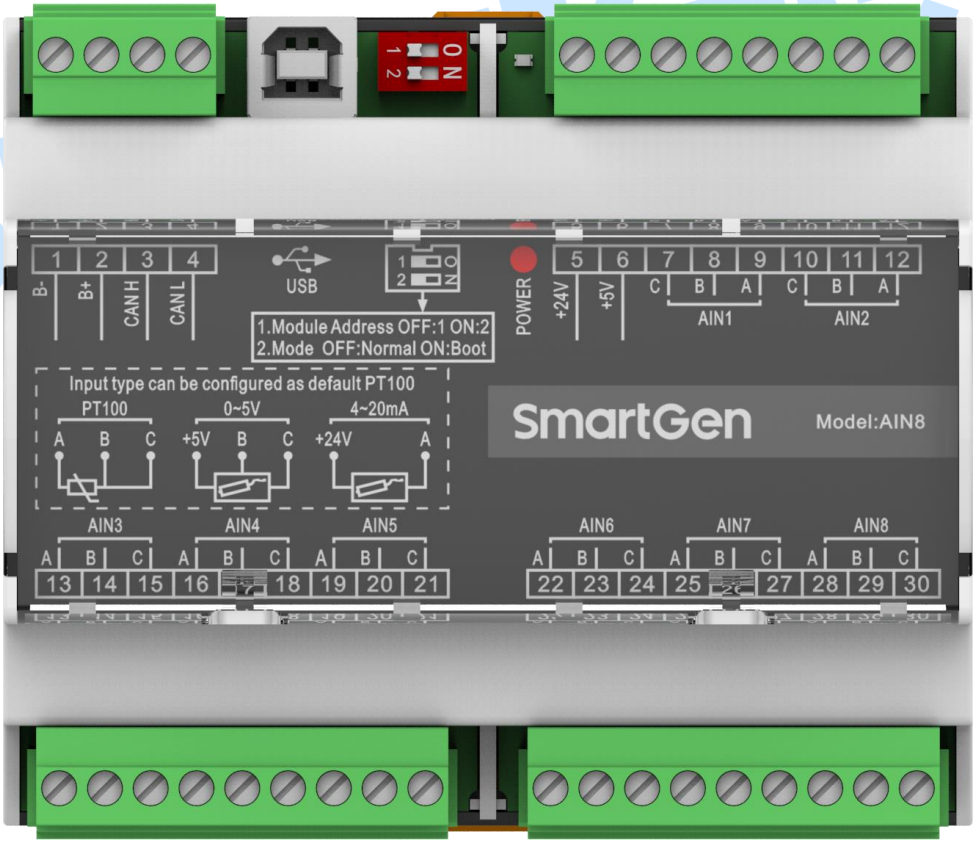
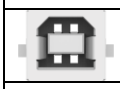


Fig.1 – AIN8 Terminal Diagram

Table 3 – Wire Connection Description

No.	Function		Cable Size	Remark
1	B-		1.0mm²	DC power supply negative input.
2	B+		1.0mm²	DC power supply positive input.
3	CAN(H)		0.5mm²	Connect with CANBUS port of the host controller. 120Ω impedance shielding wire is recommended with single en earthed.
4	CAN(L)			
5	+24V		1.0mm²	Supply power for(4~20)mA sensor.
6	+5V		1.0mm²	Supply power for (0-5)V sensor.
7	AIN1	C	0.5mm²	1st channel sensor input (resistor-type, current-type and voltage-type can be chosen). After input type is confirmed, wire connection details please to see "7. *APPLICATION*".
8		B		
9		A		
10	AIN2	C	0.5mm²	2nd channel sensor input (resistor-type, current-type and voltage-type can be chosen). After input type is confirmed, wire connection details please to see "7. *APPLICATION*".
11		B		
12		A		
13	AIN3	A	0.5mm²	3rd channel sensor input (resistor-type, current-type and voltage-type can be chosen). After input type is confirmed, wire connection details please to see "7. *APPLICATION*".
14		B		
15		C		
16	AIN4	A	0.5mm²	4th channel sensor input (resistor-type, current-type and voltage-type can be chosen). After input type is confirmed, wire connection details please to see "7. *APPLICATION*".
17		B		
18		C		
19	AIN5	A	0.5mm²	5th channel sensor input (resistor-type, current-type and voltage-type can be chosen). After input type is confirmed, wire connection details please to see "7. *APPLICATION*".
20		B		
21		C		
22	AIN6	A	0.5mm²	6th channel sensor input (resistor-type, current-type and voltage-type can be chosen). After input type is confirmed, wire connection details please to see "7. *APPLICATION*".
23		B		
24		C		
25	AIN7	A	0.5mm²	7th channel sensor input (resistor-type, current-type and voltage-type can be chosen). After input type is confirmed, wire connection details please to see "7. *APPLICATION*".
26		B		
27		C		
28	AIN8	A	0.5mm²	8th channel sensor input (resistor-type, current-type and voltage-type can be chosen). After input type is confirmed, wire connection details please to see "7. *APPLICATION*".
29		B		
30		C		
	SWITCH	Host controller can connect with not more than 2 AIN8 module; Module address: Switch 1 in the OFF position (12 side) corresponds to 1 and the ON position to 2; BOOT mode select: It is NON-BOOT mode when the switch 2 is connected to terminal 12 while BOOT mode when connect to ON terminal. **NOTE: BOOT mode is used to update the software, please caution to use!**		
	USB	It is a communication port to calibrate parameters.		
	POWER	It is the power and communication status indicator lamp, if communication fail, "POWER" lamp flashes.		

5 PROTECTION

5.1 PARAMETER SETTING

All data can be protected via host controller. Following parameters can be set via host controller:

- AIN8 module enable: host controller can communicate with the module and collect the AIN8 data only when the module is enabled;
- Type, curve and range of each sensor;
- Alarm enable, alarm threshold, alarm action, alarm delay, etc. of each sensor.

NOTE: The sensor names can be defined via PC software.

5.2 WARNING

Table 4 – Warning Alarms

No.	Items	Description
1	Sensor 1~8 high	When the controller detects that the sensor 1-8 alarm information, it will initiate an alarm signal and the corresponding alarm information will be displayed on LCD. The sensor name displayed on LCD is self- defined.
2	Sensor 1~8 Low	
3	Sensor 1~8 open circuit	
NOTE: AIN8 module is only responsible for data collection. When the sensor input value reaches the pre-set alarm conditions, the master controller will send alarm information. The alarm information is completely processed by master controller and is unrelated to AIN8 module.		

6. APPLICATION

6.1 PT100 SENSOR APPLICATION DIAGRAM

AIN8 can connect with 3 types of sensor, and PT100 resistor-type wiring application diagram is as below,

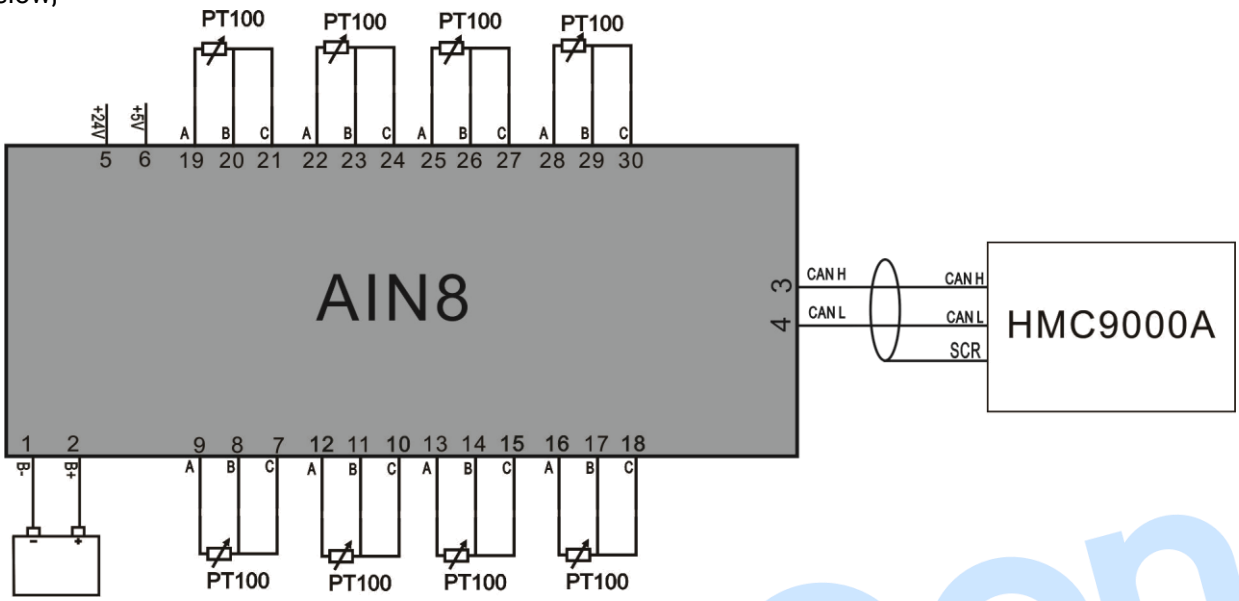


Fig.2 – PT100 Sensor Wring Conenction

6.2 4~20mA CURRENT TYPE SENSOR APPLICATION DIAGRAM

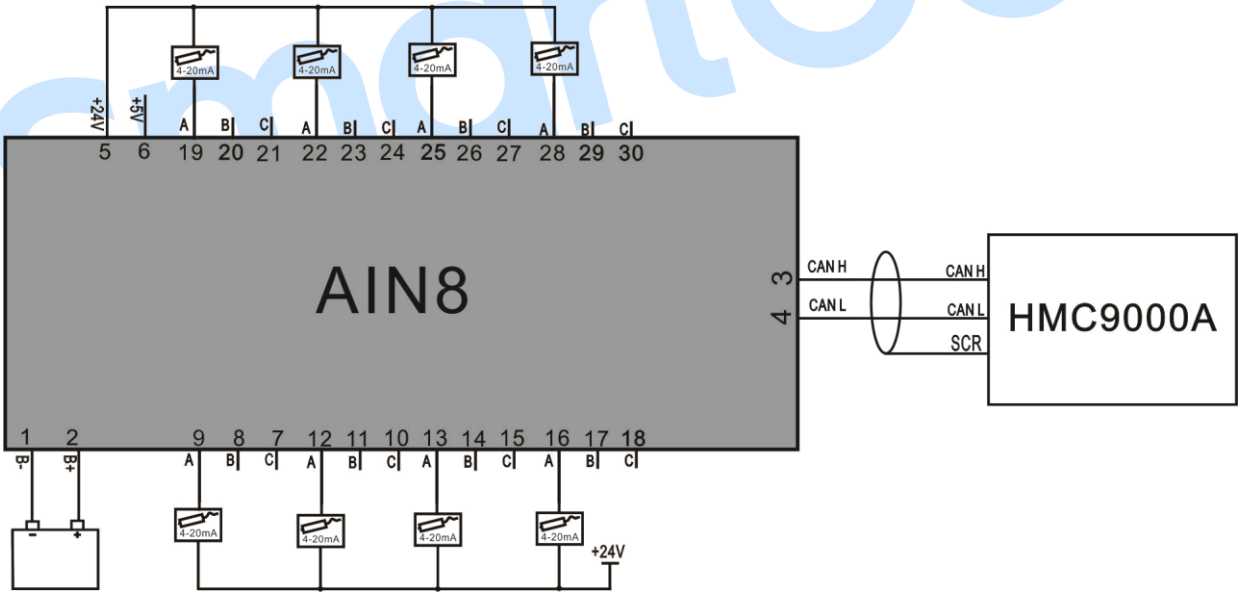


Fig.3 – (4~20)mA Sensor Wring Conenction

6.3 0~5V VOLTAGE TYPE SENSOR APPLICATION DIAGRAM

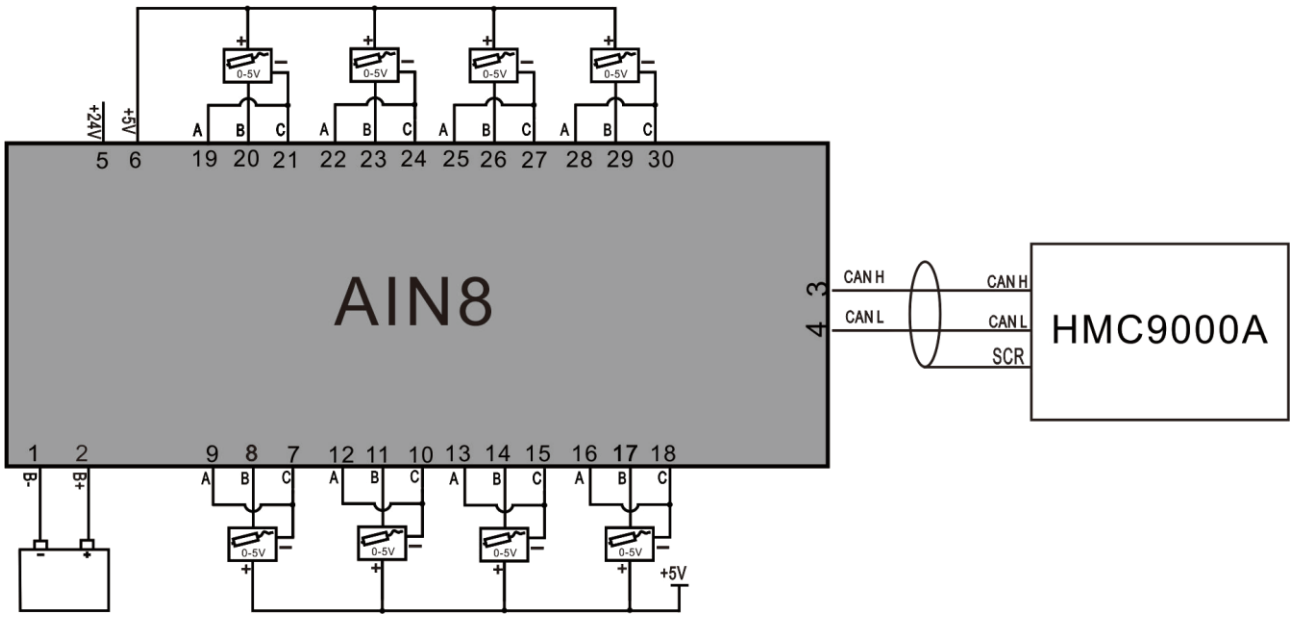


Fig.4 – (0-5)V Sensor Wring Conenction

7 INSTALLATION

Unit: mm

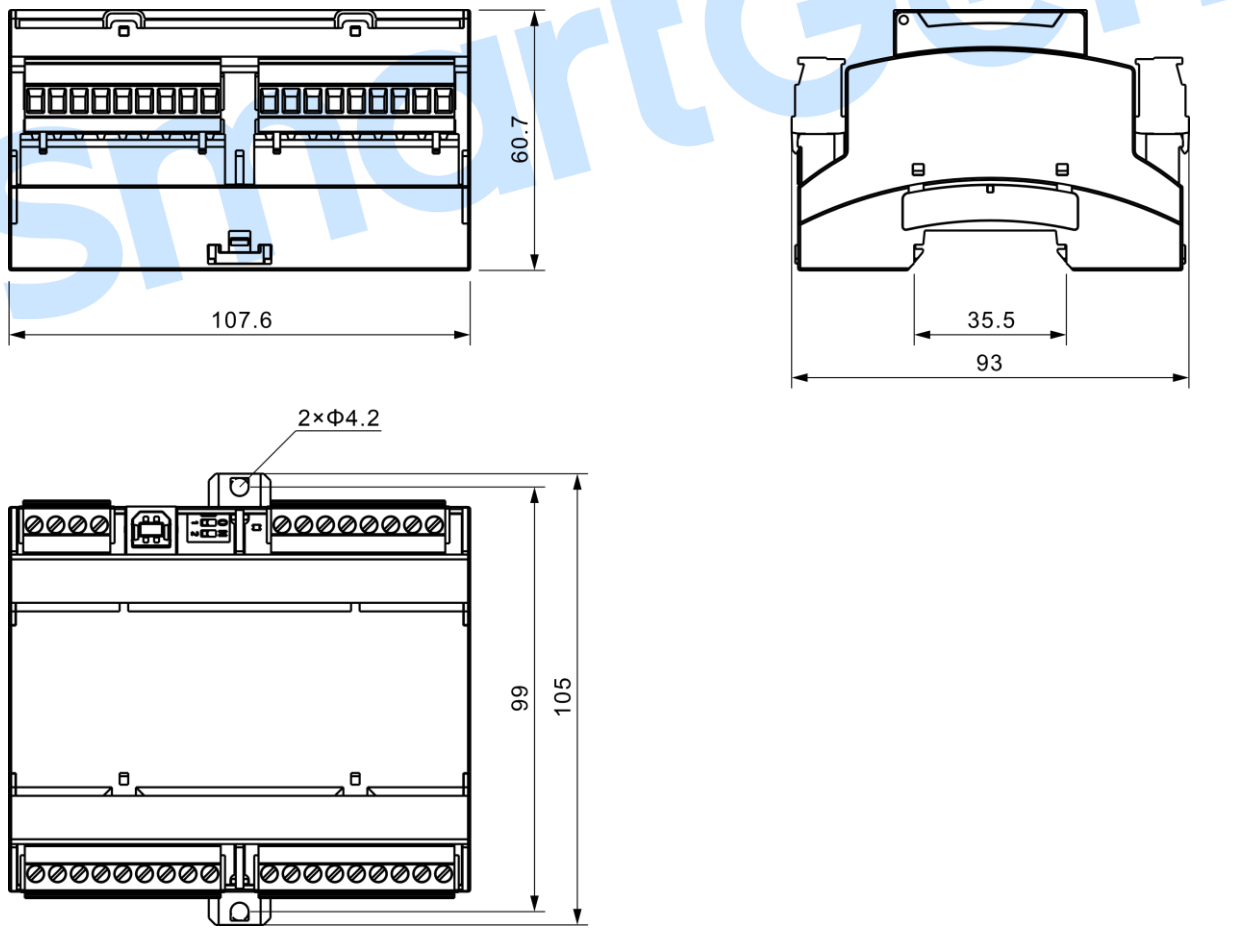


Fig.5– Overall Dimension

8 TROUBLESHOOTING

Table 5 – Troubleshooting

PROBLEM	POSSIBLE SOLUTION
Controller no response with power.	Check controller connection wirings;
Module communication failure	Check whether AIN8 module is enabled or not;
Large deviation of collected data	Check if the type of chosen sensor or wire connection is correct.