

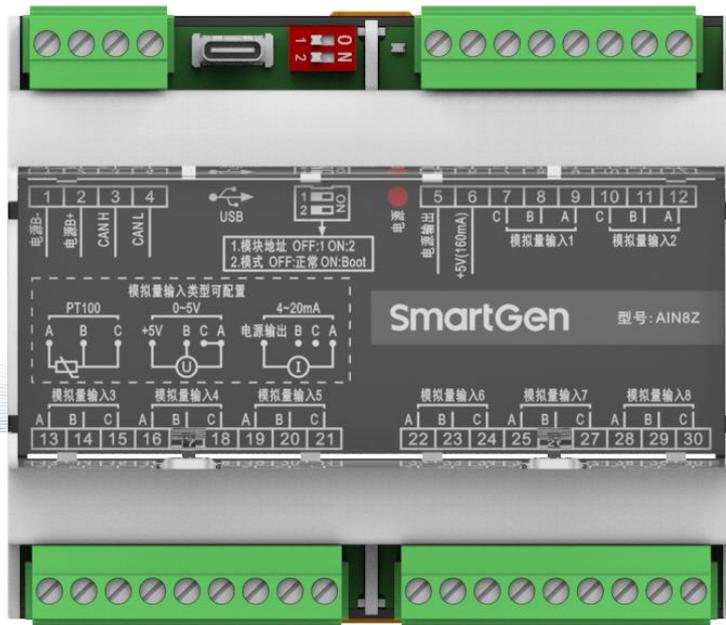
SmartGen

MAKING CONTROL SMARTER

AIN8Z

ANALOG INPUT MODULE

USER MANUAL



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Table 1 - Software Version

Date	Version	Content
2024-01-22	1.0	Original release.
2024-12-21	1.1	Modify the typical application diagrams.
2025-03-04	1.2	<ol style="list-style-type: none">1. Modify the description of the module's CANBUS baud rate in the "Performance and Characteristics"; and add a description of the module address;2. Update the table of technical parameters;3. Update the table of terminal wiring description;4. Update the protection description.

CONTENT

1 OVERVIEW	4
2 PERFORMANCE AND CHARACTERISTICS	4
3 SPECIFICATION	5
4 WIRE CONNECTION	5
5 PROTECTION	8
5.1 PARAMETER SETTING	8
5.2 ALARMS	8
6 APPLICATION	9
6.1 PT100 SENSOR APPLICATION DIAGRAM	9
6.2 4~20mA CURRENT TYPE SENSOR APPLICATION DIAGRAM	9
6.3 0~5V VOLTAGE TYPE SENSOR APPLICATION DIAGRAM	10
7 OVERALL AND INSTALLATION DIMENSIONS	10
8 TROUBLE SHOOTING	11

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1 OVERVIEW

AIN8Z 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 AIN8Z 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

Its main characteristics are as follows:

- 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;
- AIN8Z CANBUS communication baud rate can be configured as 250kbps;
- The module address can be set by DIP switch, for Switch 1, when set to the OFF position (toward 12), the address is 1; when set to the ON position, the address is 2;
- AIN8Z must be used with the host controller;
- Wide 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 installation.

Table 2 – Performance Parameters

Item	Content
Working Voltage Range	DC8.0V~35.0V, DC reverse protection
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.	(-40~+70) $^{\circ}$ C
Working Humidity	(20~93)%RH
Storage Temp.	(-40~+70) $^{\circ}$ 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

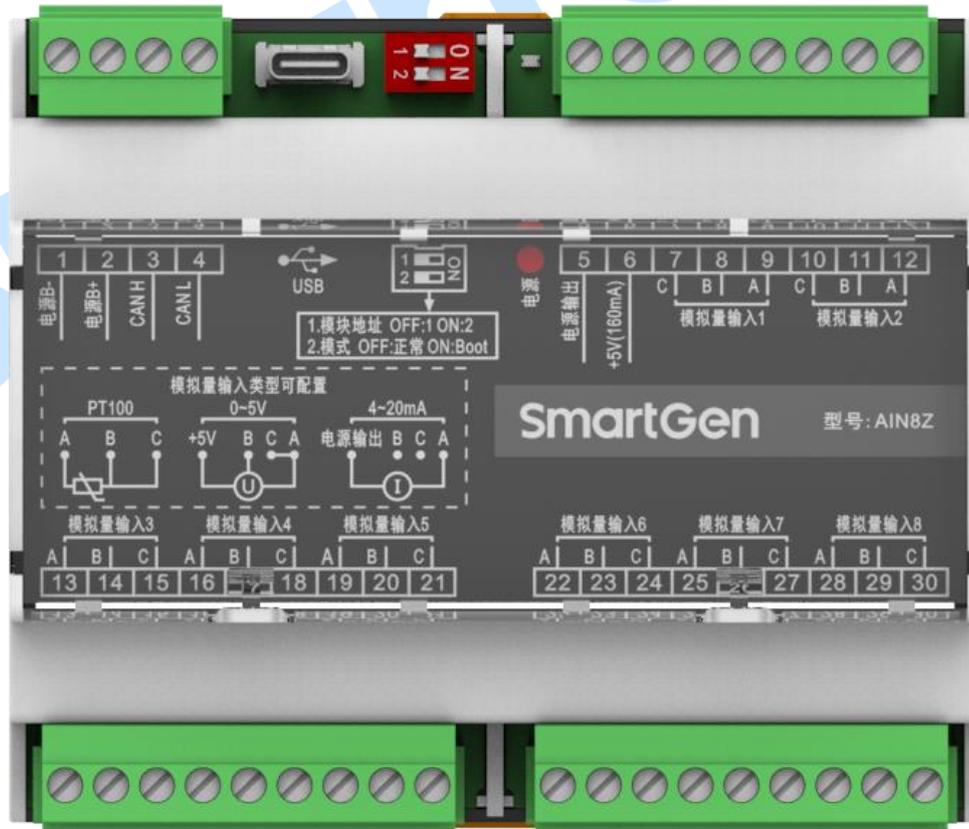


Fig.1 – AIN8Z Terminal Diagram

Table 3 – Wire Connection Description

No.	Function	Cable Size	Remark	
1	B-	1.0mm ²	DC power supply negative input.	
2	B+	1.0mm ²	DC power supply positive input.	
3	CAN(H)	0.5mm ²	The CANBUS interface for communication with the master controller should use shielding wire with impedance of 120Ω. Its single-end connect with ground.	
4	CAN(L)			
5	Power Supply Output	1.0mm ²	Supply power for(4~20)mA sensor.	
6	+5V(160mA)	1.0mm ²	Supply power for (0-5)V sensor.	
7	Analog Input 1	C	0.5mm ²	1 st channel sensor input (resistor-type, current-type and voltage-type can be chosen). After input type is confirmed, wire connection details please to see "6. APPLICATION".
8		B		
9		A		
10	Analog Input 2	C	0.5mm ²	2 nd channel sensor input (resistor-type, current-type and voltage-type can be chosen). After input type is confirmed, wire connection details please to see "6. APPLICATION".
11		B		
12		A		
13	Analog Input 3	A	0.5mm ²	3 rd channel sensor input (resistor-type, current-type and voltage-type can be chosen). After input type is confirmed, wire connection details please to see "6. APPLICATION".
14		B		
15		C		
16	Analog Input 4	A	0.5mm ²	4 th channel sensor input (resistor-type, current-type and voltage-type can be chosen). After input type is confirmed, wire connection details please to see "6. APPLICATION".
17		B		
18		C		
19	Analog Input 5	A	0.5mm ²	5 th channel sensor input (resistor-type, current-type and voltage-type can be chosen). After input type is confirmed, wire connection details please to see "6. APPLICATION".
20		B		
21		C		
22	Analog Input 6	A	0.5mm ²	6 th channel sensor input (resistor-type, current-type and voltage-type can be chosen). After input type is confirmed, wire connection details please to see "6. APPLICATION".
23		B		
24		C		
25	Analog Input 7	A	0.5mm ²	7 th channel sensor input (resistor-type, current-type and voltage-type can be chosen). After input type is confirmed, wire connection details please to see "6. APPLICATION".
26		B		
27		C		
28	Analog Input 8	A	0.5mm ²	8 th channel sensor input (resistor-type, current-type and voltage-type can be chosen). After input type is confirmed, wire connection details please to see "6. APPLICATION".
29		B		
30		C		
	SWITCH	Host controller can connect with not more than 2 AIN8Z modules; Module Address: It is 1 when the switch 1 is connected to OFF (terminal 12) while 2 when connect to ON terminal.		

No.	Function	Cable Size	Remark
			BOOT mode select: It is NON-BOOT mode when the switch 2 is connected to OFF (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 fails, "POWER" lamp will flash.

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5 PROTECTION

5.1 PARAMETER SETTING

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

- AIN8Z module enable: host controller can communicate with the module and collect the AIN8Z data only when the module is enabled;
- Type, curve, range of each sensor;
- Alarm threshold, alarm enable, alarm action and alarm delay of each sensor;

▲ NOTE: The sensor name can be defined by PC software.

5.2 ALARMS

Table 4 –Alarms

No.	Items	Description
1	Sensor 1~8 high	When the controller detects that the sensor 1-8 alarm signals, it will initiate an alarm and the corresponding alarm information will be displayed on LCD. The sensor name displayed during alarms is a user-defined name.
2	Sensor 1~8 Low	
3	Sensor 1~8 open circuit	
<p>NOTE: The AIN8Z module only collects data. When the sensor input value meets the preset alarm condition, the master controller will trigger an alarm. The processing of the alarm information is entirely handled by the master controller and is irrelevant to the AIN8Z module.</p>		

6 APPLICATION

6.1 PT100 SENSOR APPLICATION DIAGRAM

AIN8Z can connect with 3 types of sensors, and PT100 resistor-type wiring application diagram is as below

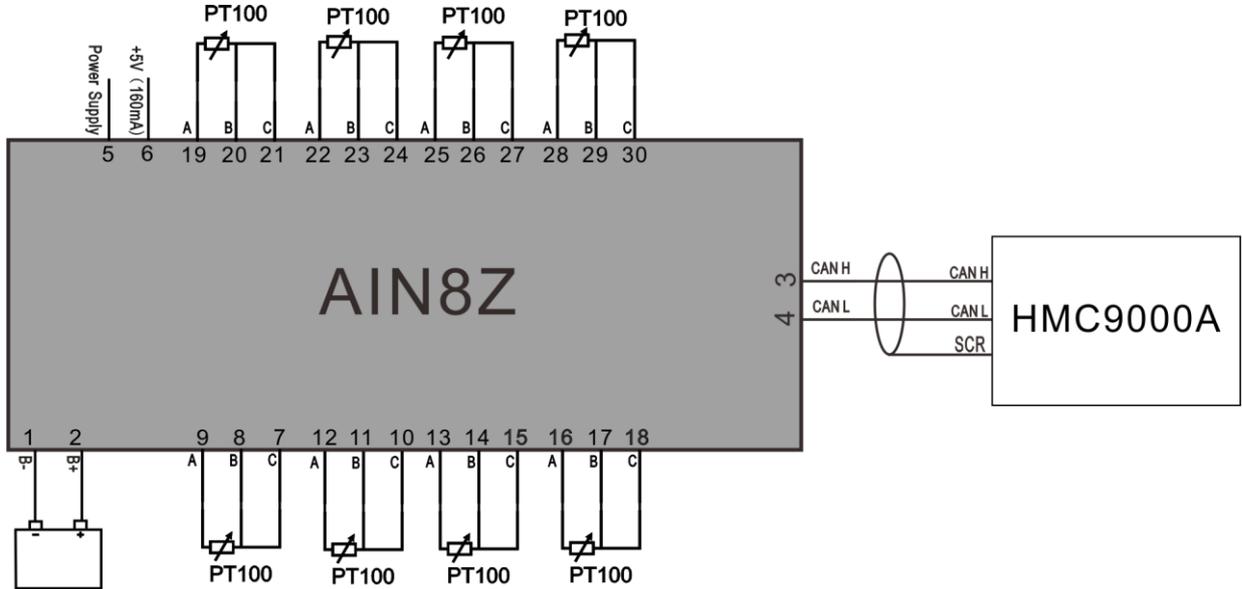


Fig.2 – PT100 Sensor Wring Conenction

6.2 4~20mA CURRENT TYPE SENSOR APPLICATION DIAGRAM

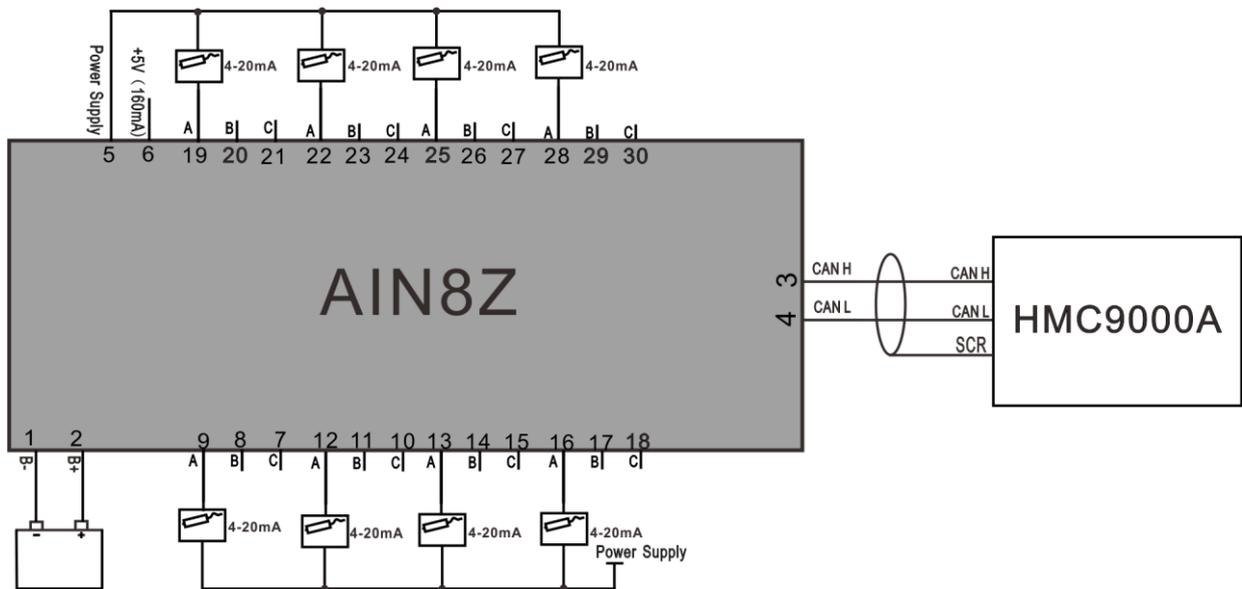


Fig.3 – (4~20)mA Sensor Wring Conenction

6.3 0~5V VOLTAGE TYPE SENSOR APPLICATION DIAGRAM

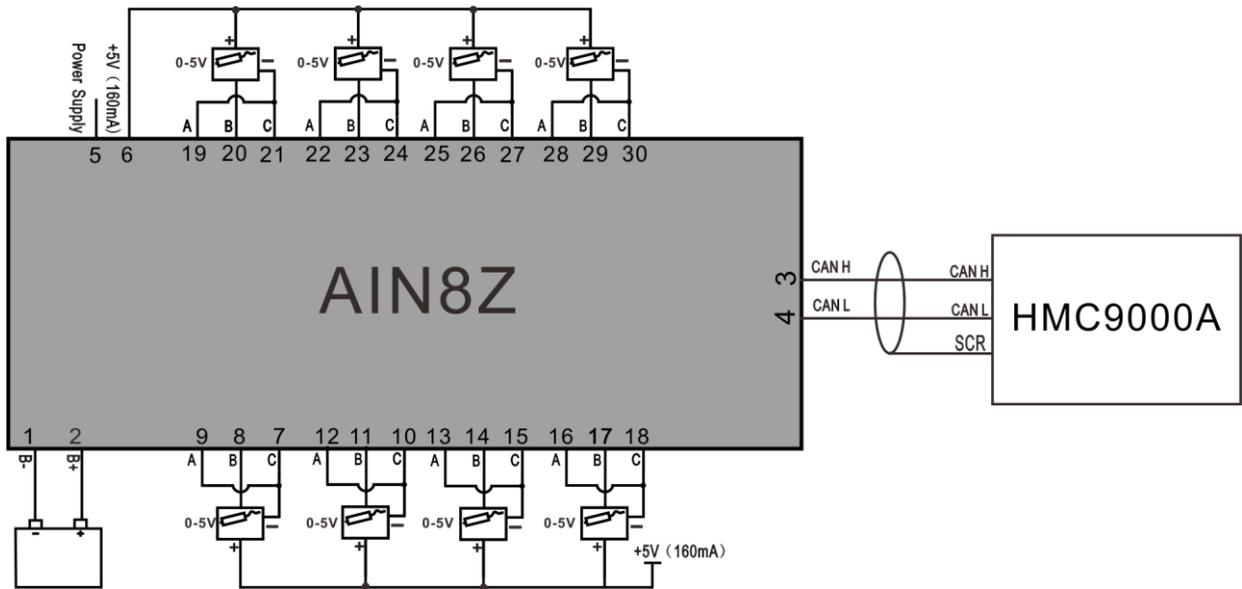


Fig.4 – (0-5)V Sensor Wring Conenction

7 OVERALL AND INSTALLATION DIMENSIONS

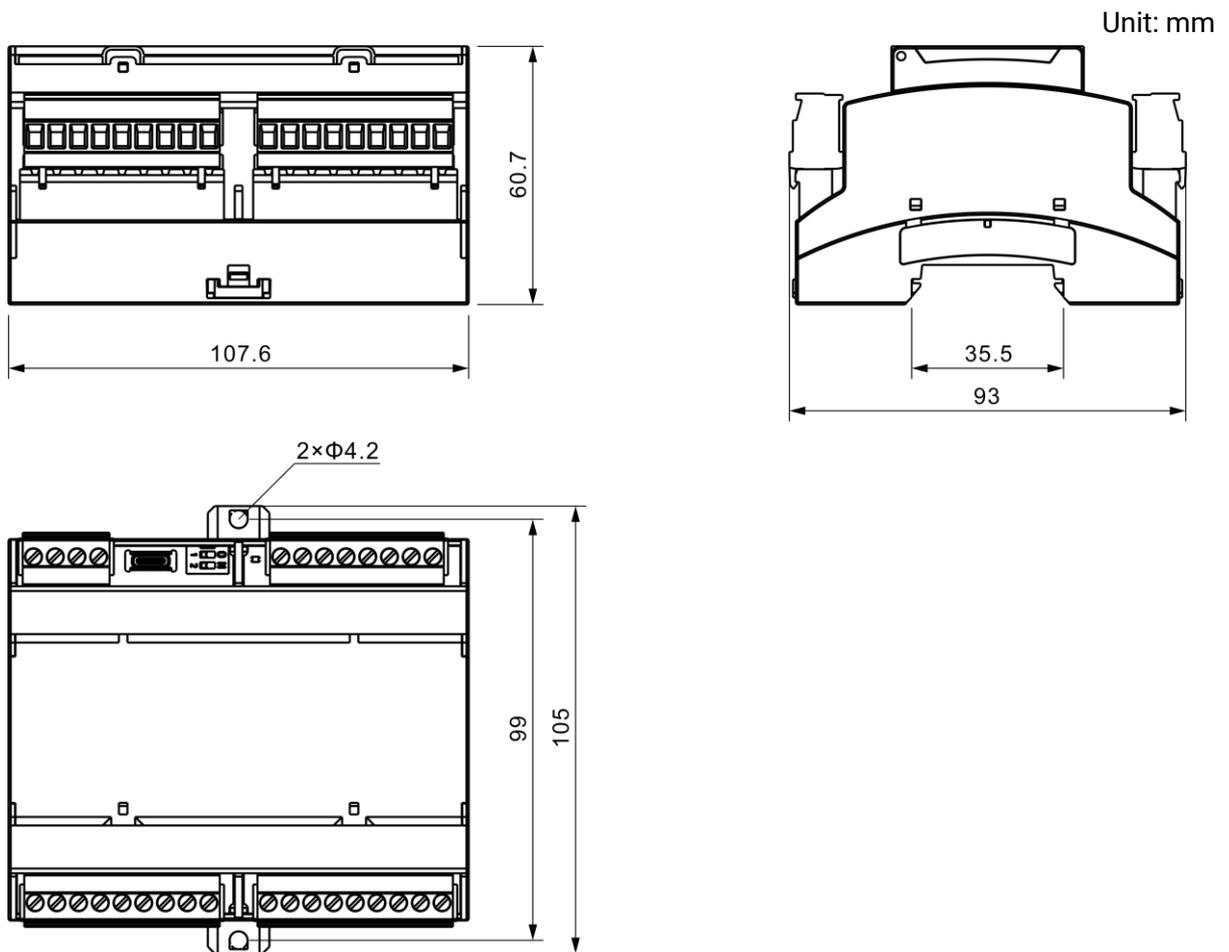


Fig.5– Overall Dimension

Table 5 – Trouble Shooting

Symptoms	Possible Solutions
Controller no response with power	Check controller connection wirings;
Module communication failure	Check whether AIN8Z module is enabled or not;
Large deviation of collected data	Check if the type of chosen sensor or wire connection is correct.

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