

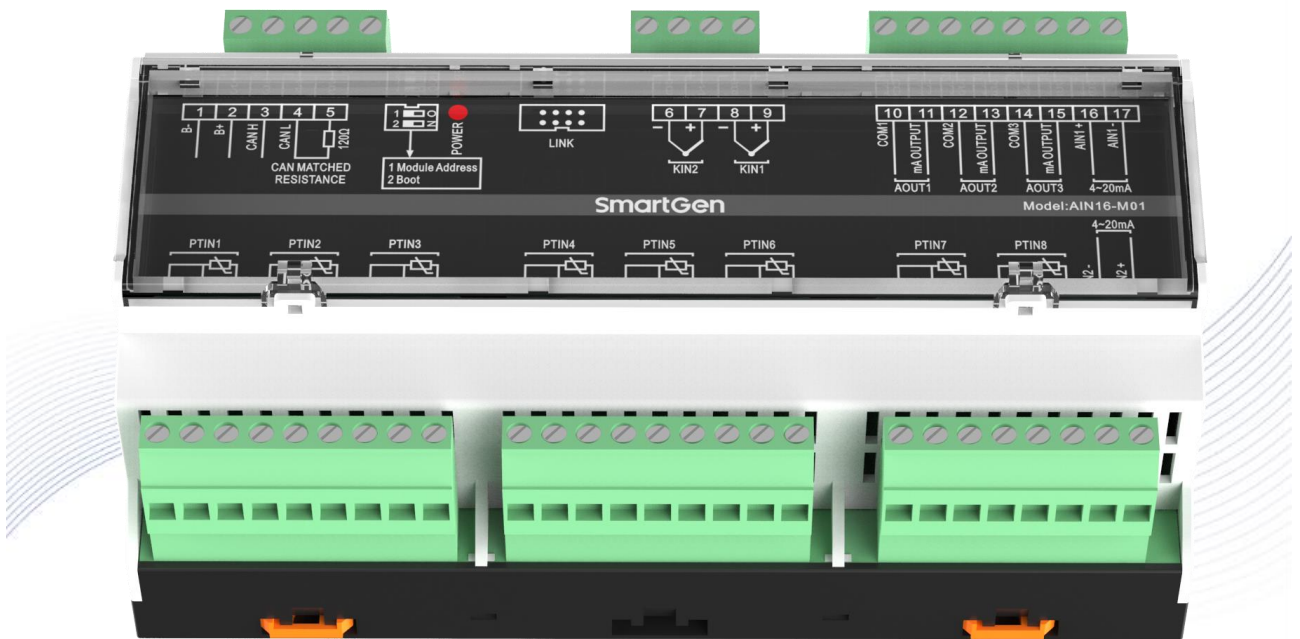
SmartGen

MAKING CONTROL SMARTER

AIN16-M01

ANALOG INPUT/OUTPUT MODULE

USER MANUAL



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Table 1 - Software Version

| Date | Version | Content |
|------------|---------|---|
| 2014-10-10 | 1.0 | Original release. |
| 2017-03-17 | 1.1 | Updated the manual format. |
| 2022-11-19 | 1.2 | Updated the manual format and logo of SmartGen. |
| 2023-03-06 | 1.3 | Updated the manual version. |
| | | |

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1 OVERVIEW

AIN16-M01 analog input/output module contains 2 channels of K-type thermocouple sensor, 8 channels of resistor-type sensor and 2 channels of (4~20)mA current-type sensor input channels, and 3 channels of 4~20mA output channels. Collecting data are transmitted to the host controller for processing via CANBUS port, and the host controller can configure alarms of 12 input channels and PID parameters of 3 4~20mA output channels respectively as demand.

2 PERFORMANCE AND CHARACTERISTICS

Main characteristics are as below,

- a) 32-bit ARM micro-processor with high integration of hardware and more reliable;
- b) Must be used with host controller together;
- c) CANBUS communication baud rate can be set as 250kbps;
- d) Module address can be set as 1 or 2;
- e) Widely power supply range DC(8~35)V, suitable to different starting battery voltage environment;
- f) 35mm rail mounting type;
- g) Modular design, pluggable terminal, compact structure with easy installation.

3 TECHNICAL PARAMETERS

Table 2 – Technical Specification

| Item | Content |
|--------------------------------|--------------------------------------|
| Working Voltage | DC8.0V~35.0V continuous power supply |
| Power Consumption | <0.5W |
| K-type Thermocouple Accuracy | 1°C |
| Resistance Sensor Type | PT100, VDO |
| 4~20mA Current Sensor Accuracy | 0.25 level |
| Case Dimension | 161.6mm x 89.7mm x 60.7mm |
| Rail Dimension | 35mm |
| Working Temperature | (-25~+70)°C |
| Working Humidity | (20~93)% |
| Storage Temperature | (-25~+70)°C |
| Weight | 0.33kg |

4 WIRE CONNECTION

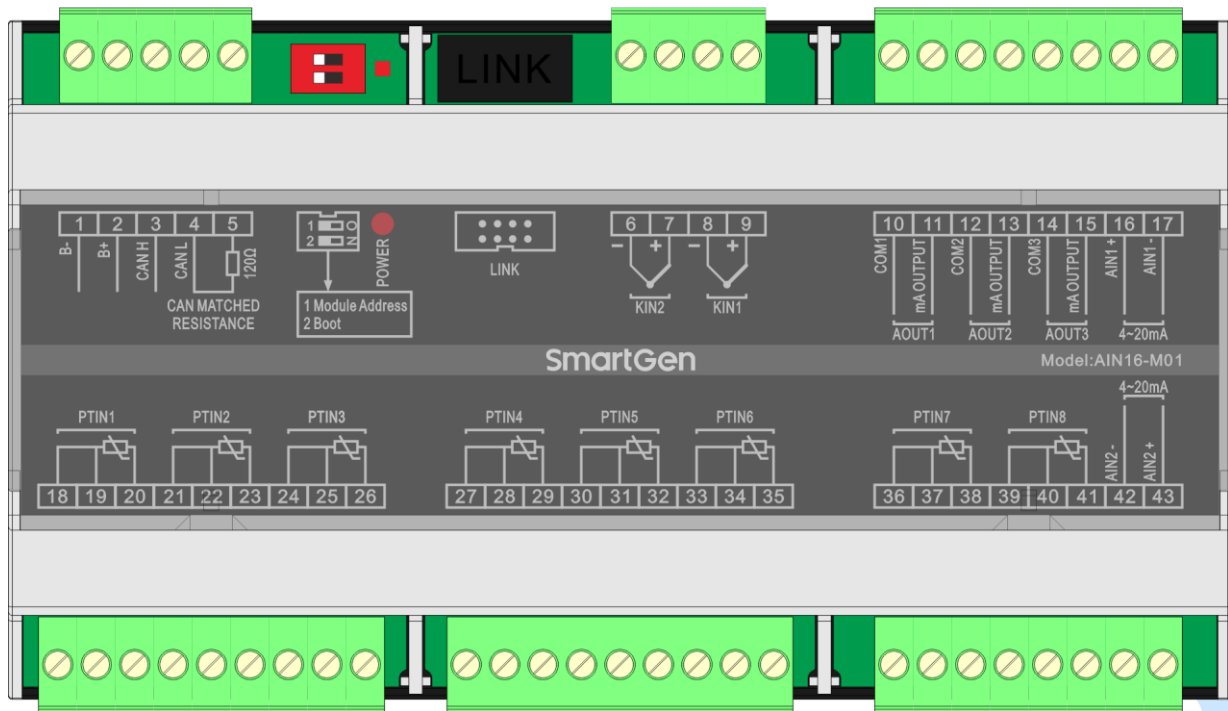


Fig.1 – AIN16-M01 Terminals Drawing

Table 3 – Terminal 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 | A CANBUS port, communicated with host controller, is using 120Ω shielding wire with one en grounded. If 120Ω matched resistance is needed, short connecting terminal No.3 and No.5. |
| 4 | CAN(L) | | |
| 5 | Terminal Matched Resistance (120Ω) | | |
| 6 | KIN2- | 0.5mm ² | K-type thermocouple sensor |
| 7 | KIN2+ | | |
| 8 | KIN1- | 0.5mm ² | K-type thermocouple sensor |
| 9 | KIN1+ | | |
| 10 | COM1 | 1.0mm ² | AOUT1((4-20)mA output current 1) |
| 11 | mA OUTPUT | 1.0mm ² | |
| 12 | COM2 | 1.0mm ² | AOUT2((4-20)mA output current 2) |
| 13 | mA OUTPUT | 1.0mm ² | |
| 14 | COM3 | 1.0mm ² | AOUT3((4-20)mA output current 3) |
| 15 | mA OUTPUT | 1.0mm ² | |
| 16 | AIN1+ | 0.5mm ² | (4-20)mA current-type sensor 1 input+ |
| 17 | AIN1- | | (4-20)mA current-type sensor 1 input- |
| 18 | PT100 Sensor 1 | C | Sensor common port |

| No. | Function | Cable Size | Remark |
|-----|----------------|--------------------|---|
| 19 | | B | Sensor terminal |
| 20 | | A | |
| 21 | PT100 Sensor 2 | C | Sensor common port |
| 22 | | B | 0.5mm ² |
| 23 | A | | |
| 24 | PT100 Sensor 3 | C | Sensor common port |
| 25 | | B | 0.5mm ² |
| 26 | A | | |
| 27 | PT100 Sensor 4 | C | Sensor common port |
| 28 | | B | 0.5mm ² |
| 29 | A | | |
| 30 | PT100 Sensor 5 | C | Sensor common port |
| 31 | | B | 0.5mm ² |
| 32 | A | | |
| 33 | PT100 Sensor 6 | C | Sensor common port |
| 34 | | B | 0.5mm ² |
| 35 | A | | |
| 36 | PT100 Sensor 7 | C | Sensor common port |
| 37 | | B | 0.5mm ² |
| 38 | A | | |
| 39 | PT100 Sensor 8 | C | Sensor common port |
| 40 | | B | 0.5mm ² |
| 41 | A | | |
| 42 | AIN2- | 0.5mm ² | (4-20)mA current-type sensor 2 input- |
| 43 | AIN2+ | | (4-20)mA current-type sensor 2 input+ |
| | SWITCH | | <p>The host controller can connect with two AIN16-M02 modules at the same time.</p> <p>Address selection: It is address 1 (module 1) when the switch 1 is connected to terminal 12 while address 2 (module 2) when connect to ON terminal.</p> <p>BOOT selection: It is normal mode when the switch 2 is connected to terminal 12 while programming mode when connect to ON terminal.</p> |
| | POWER | | It is power supply indicator. |

5 ELECTRICAL CONNECTIONS

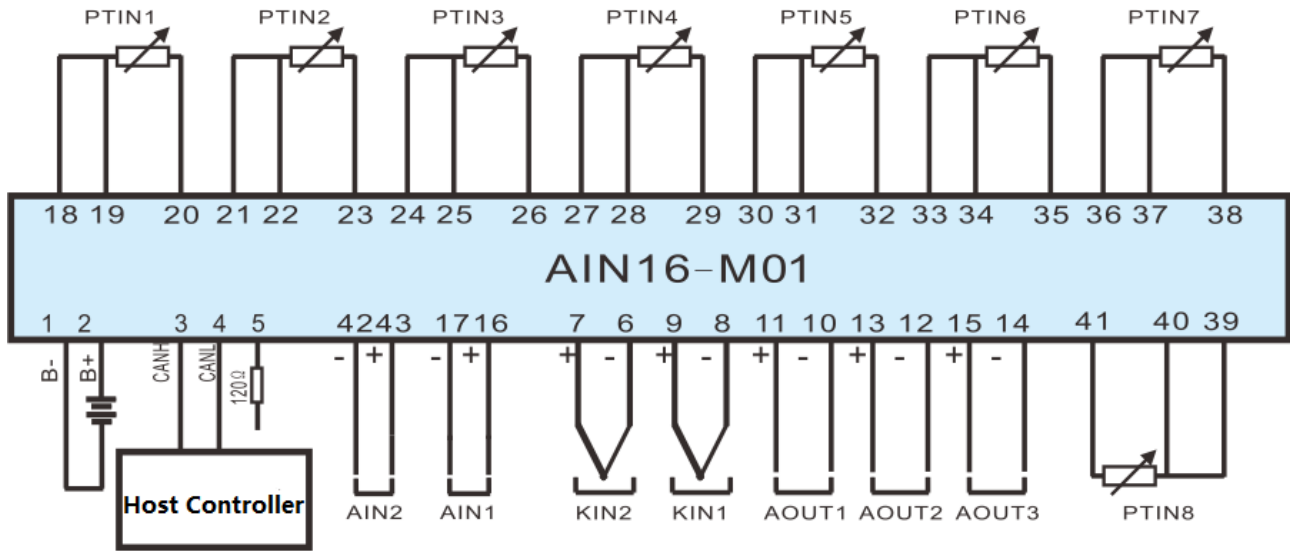


Fig.2 – Electrical Connection Diagram

6 INSTALLATION

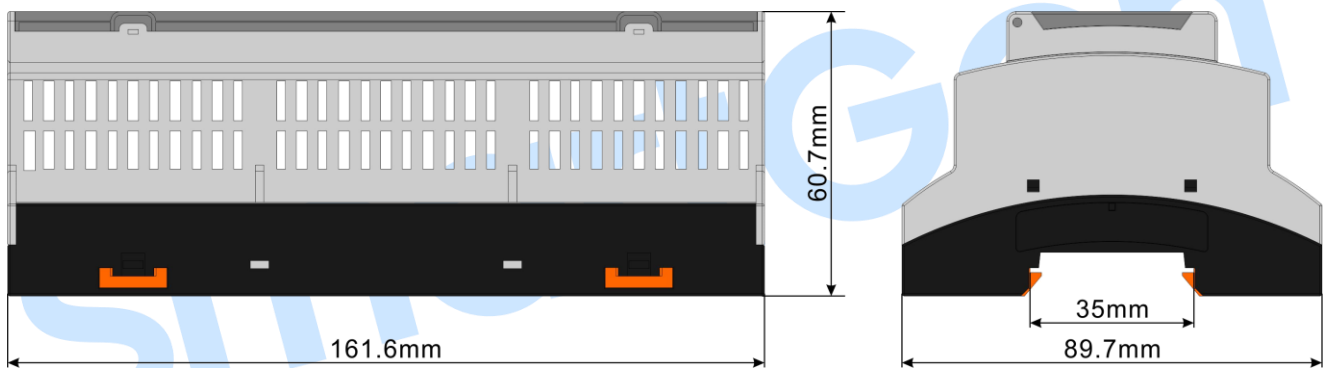


Fig.3 – Overall Dimensions

7 TROUBLESHOOTING

Table 4 – Trouble Finding

| Problem | Possible Solution |
|------------------------------------|---|
| Controller no response with power. | Check power supply; Check controller connection wirings; Check DC fuse. |
| CANBUS communication failure | Check if CANBUS wires are connected in the opposite way. |