

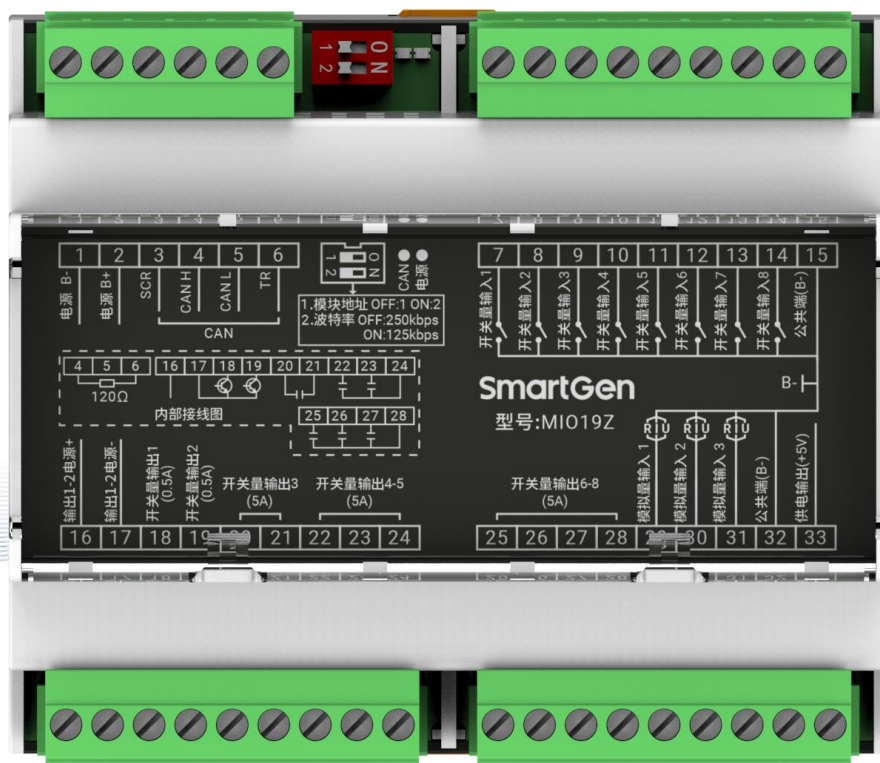
SmartGen

MAKING CONTROL SMARTER

MI019Z

INTEGRATED EXPANSION MODULE

USER MANUAL



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Table 1 – Software Version

Date	Version	Notes
2026-01-06	1.0	Original release.

Table 2 – Notation Clarification

Symbol	Instruction
 NOTE	Highlights an essential element of a procedure to ensure correctness.
 CAUTION	Indicates a procedure or practice, which, if not strictly observed, could result in damage or destruction of equipment.
 WARNING	Indicates a procedure or practice, which could result in injury to personnel or loss of life if not followed correctly.

1 OVERVIEW

MI019Z Integrated Expansion Module is an integrated input/output module, which can connect with master controller HGM8151Z/HGM8152Z via CANBUS and all the parameters and data can be set and viewed through master controller. It applies to marine main propulsion units, main generator units, emergency units or pumping units.

2 PERFORMANCE AND CHARACTERISTICS

Its main characteristics are as follows:

- 8 digital inputs, the specific functions can be set by mater control;
- 2 isolated transistor outputs, Aux. outputs 1~2, the specific functions can be set by mater control;
- 6 volt-free relay outputs, Aux. outputs 3~8, the specific functions can be set by mater control;
- 3 analog sensor inputs, the input signals of resistance-type, voltage-type and current-type are optional;
- Modular design, compact structure, small volume and easy to use.

Table 3 – Performance Parameters

Item	Content
Working Voltage	DC8.0V~DC 35.0V
Overall Consumption	≤2.6W
Analog Sensor 1~3	Resistance Input Range: 0Ω ~ 3000Ω Resolution: 0.1Ω Accuracy: 1Ω (below 300Ω)
	Voltage Input Range: 0V ~ 5V Resolution: 0.01V Accuracy: 1%
	Current Input Range: 3mA ~ 20mA Resolution: 0.01mA Accuracy: 1%
Aux. Relay Output 1	Isolated transistor output, connect Terminal 16 to DC positive (8-35V) and Terminal 17 to DC negative externally. The output is then taken from Terminals 18 and 19, with a rated current of 0.5A.
Aux. Relay Output 2	
Aux. Relay Output 3	5A Volt-free relay output, connect to COM
Aux. Relay Output 4	5A Volt-free relay output, connect to COM
Aux. Relay Output 5	5A Volt-free relay output, connect to COM
Aux. Relay Output 6	5A Volt-free relay output, connect to COM
Aux. Relay Output 7	5A Volt-free relay output, connect to COM
Aux. Relay Output 8	5A Volt-free relay output, connect to COM
CAN Interface	Isolation, max communication distance 250m, using Belden 9841 cable or equivalent
Case Dimension	107.6mm x 93.0mm x 60.7mm
Working Temp.	(-40~+70)°C
Working Humidity	(20~93)%RH
Storage Temp.	(-40~+80)°C
Insulation Strength	Apply AC2.2kV voltage between high voltage terminal and low voltage terminal and the leakage current is not more than 3mA within 1min.
Weight	0.24kg

4 WORKING PROCESS

MIO19Z integrated expansion module communicates with master controller via CANBUS, the master controller issues the control command to MIO19Z module through CANBUS, MIO19Z module controls relay output, input type selection of analog input port when it receives the command. MIO19Z module uploads the data of digital input port and analog input port to the master controller.

5 PANEL INSTURCTIONS

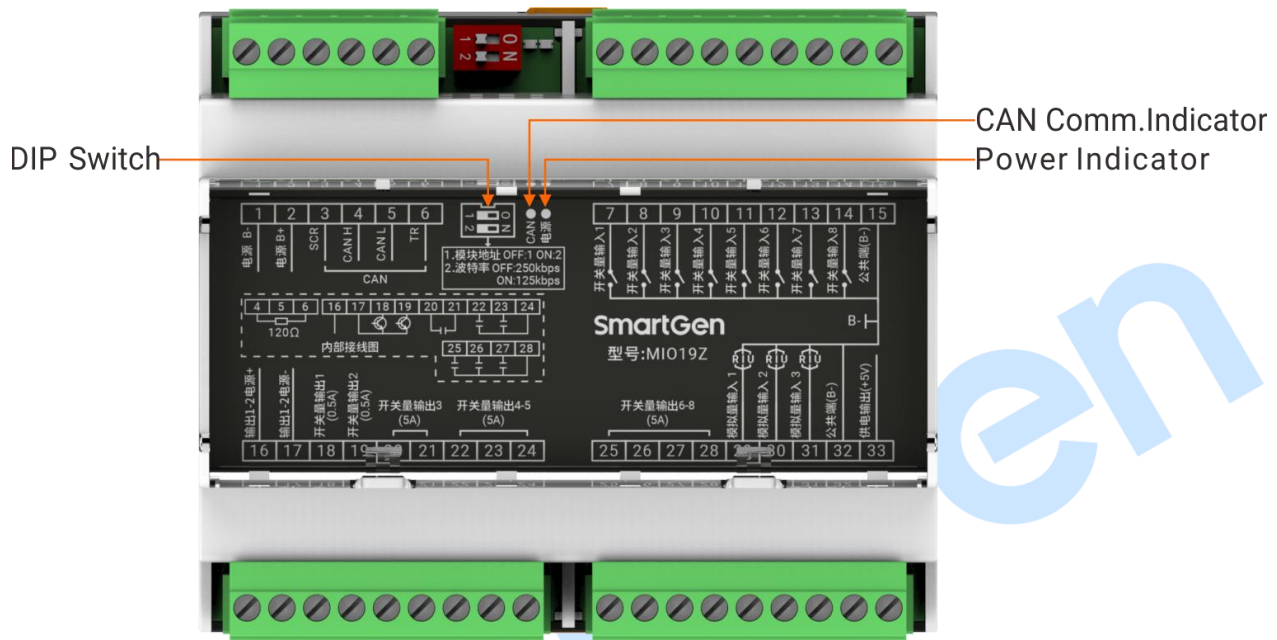


Fig.1 – MIO19Z Panel Indication

NOTE: Indicators descriptions.

NOTE1: Power indicator: always illuminated when power connection is normal;

NOTE2: CAN communication indicator: flashes during data interaction, otherwise, it is extinguished;

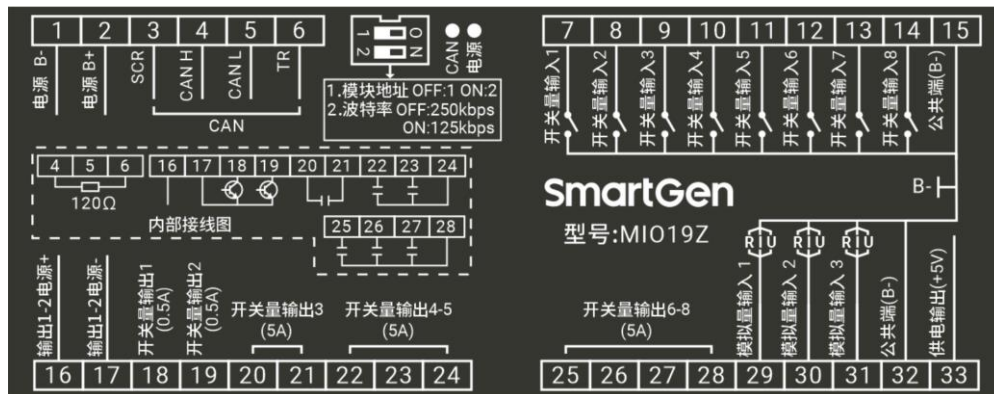


Fig.2 – Terminal Description Drawing

Table 4 – Terminal Connection

No.	Function	Cable Size	Description
1.	B-	2.5mm ²	Power supply negative input.
2.	B+	2.5mm ²	Power supply positive input.
3.	SCR	0.5mm ²	Connect to the main controller expansion CANBUS interface by using a shielding wire with an impedance of 120Ω. CANH is internally connected to 120Ω. After external short connection of CANL and TR, the function of adding a 120Ω resistor between CANH and CANL is achieved.
4.	CAN(H)	0.5mm ²	
5.	CAN(L)	0.5mm ²	
6.	TR	0.5mm ²	
7.	Digital Input 1	1.0mm ²	Input port, active when connected to input port COM (B-).
8.	Digital Input 2	1.0mm ²	Input port, active when connected to input port COM (B-).
9.	Digital Input 3	1.0mm ²	Input port, active when connected to input port COM (B-).
10.	Digital Input 4	1.0mm ²	Input port, active when connected to input port COM (B-).
11.	Digital Input 5	1.0mm ²	Input port, active when connected to input port COM (B-).
12.	Digital Input 6	1.0mm ²	Input port, active when connected to input port COM (B-).
13.	Digital Input 7	1.0mm ²	Input port, active when connected to input port COM (B-).
14.	Digital Input 8	1.0mm ²	Input port, active when connected to input port COM (B-).
15.	COM (B-)	1.5mm ²	Input port common terminal.
16.	Output 1-2 Power +	2.5mm ²	External power supply B+.
17.	Output 1-2 Power -	2.5mm ²	External power supply B-.
18.	Digital Output 1	1.0mm ²	Outputs 1 and 2 are isolated transistor outputs. Requires Terminal 16 connected to external DC positive (8-35V), Terminal 17 connected to external DC negative, then output from Terminals 18 and 19. Rated current is 0.5A.
19.	Digital Output 2	1.0mm ²	
20.	Digital Output 3	1.5mm ²	Volt-free output, rated current 5A.
21.	Digital Output 3 COM	1.5mm ²	Input port 3 common terminal.
22.	Digital Output 4	1.5mm ²	Volt-free output, rated current 5A.
23.	Digital Output 5	1.5mm ²	Volt-free output, rated current 5A.

No.	Function	Cable Size	Description
24.	Digital Output 4-5 COM	1.5mm ²	Input port 4-5 common terminal.
25.	Digital Output 6	1.5mm ²	Volt-free output, rated current 5A.
26.	Digital Output 7	1.5mm ²	Volt-free output, rated current 5A.
27.	Digital Output 8	1.5mm ²	Volt-free output, rated current 5A.
28.	Digital Output 6-8COM	1.5mm ²	Input port 6-8 common terminal.
29.	Analog Input 1	1.0mm ²	Sensor 1 input. Input type can be selected as resistance, voltage, or current type.
30.	Analog Input 2	1.0mm ²	Sensor 2 input. Input type can be selected as resistance, voltage, or current type.
31.	Analog Input 3	1.0mm ²	Sensor 3 input. Input type can be selected as resistance, voltage, or current type.
32.	Analog Input COM (B-)	1.0mm ²	This port is sensor common terminal.
33.	Power Supply Output (+5V)	1.0mm ²	Provides 5V power for voltage-type analog inputs.
	SWITCH		Module Address: DIP switch 1 in 12 position is 1, in ON position is 2; Baud Rate Selection: DIP switch 2 in 12 position is 250kbps, in ON position is 125kbps.
NOTE: When the CAN communication with the master controller is normal, the CAN communication indicator flashes; otherwise, the indicator is off.			

▲NOTE:

Cable Size Requirements: Power supply B+, B-, 2.5mm²;

Digital Input, analog input, 1.0mm²;

The current of output port according to the relay output: 5-10A (1.5mm²) , below 5A (1.0mm²);

CAN communication wire: 0.5 mm².

7 TYPICAL APPLICATION DIAGRAM

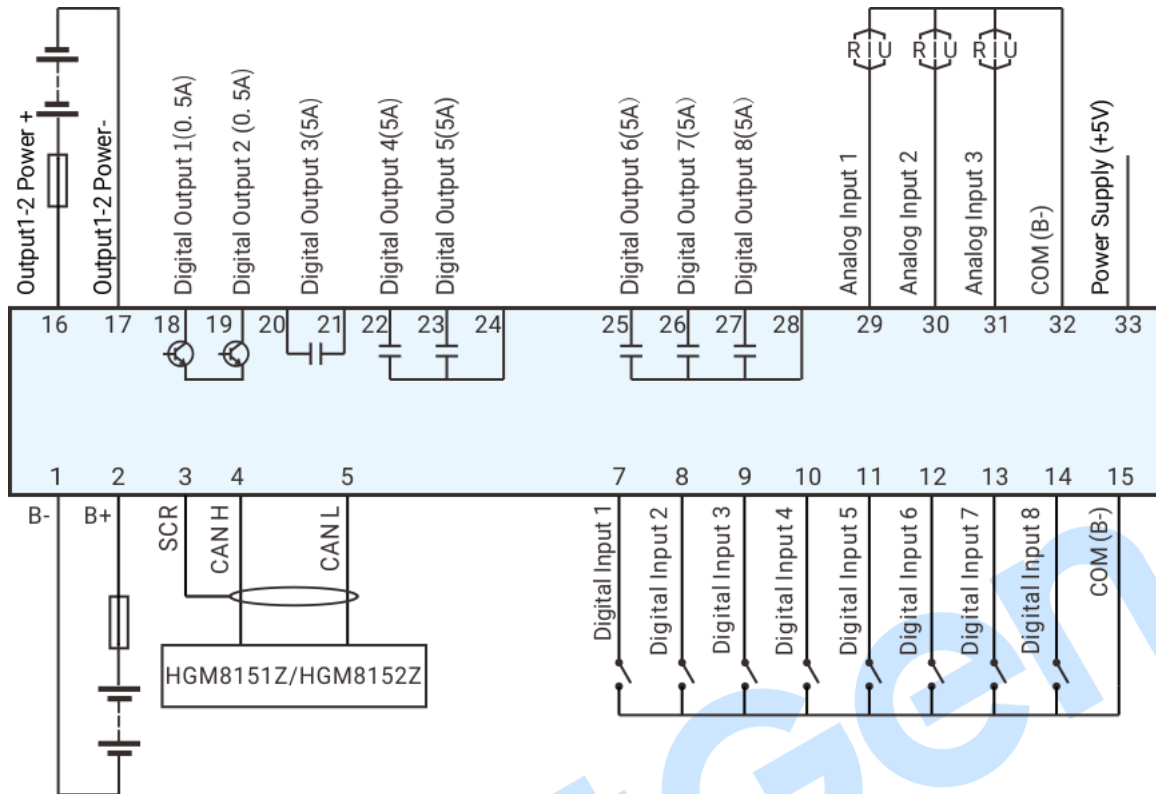


Fig.3 – MIO19Z Typical Application Diagram

8 CASE DIMENSIONS

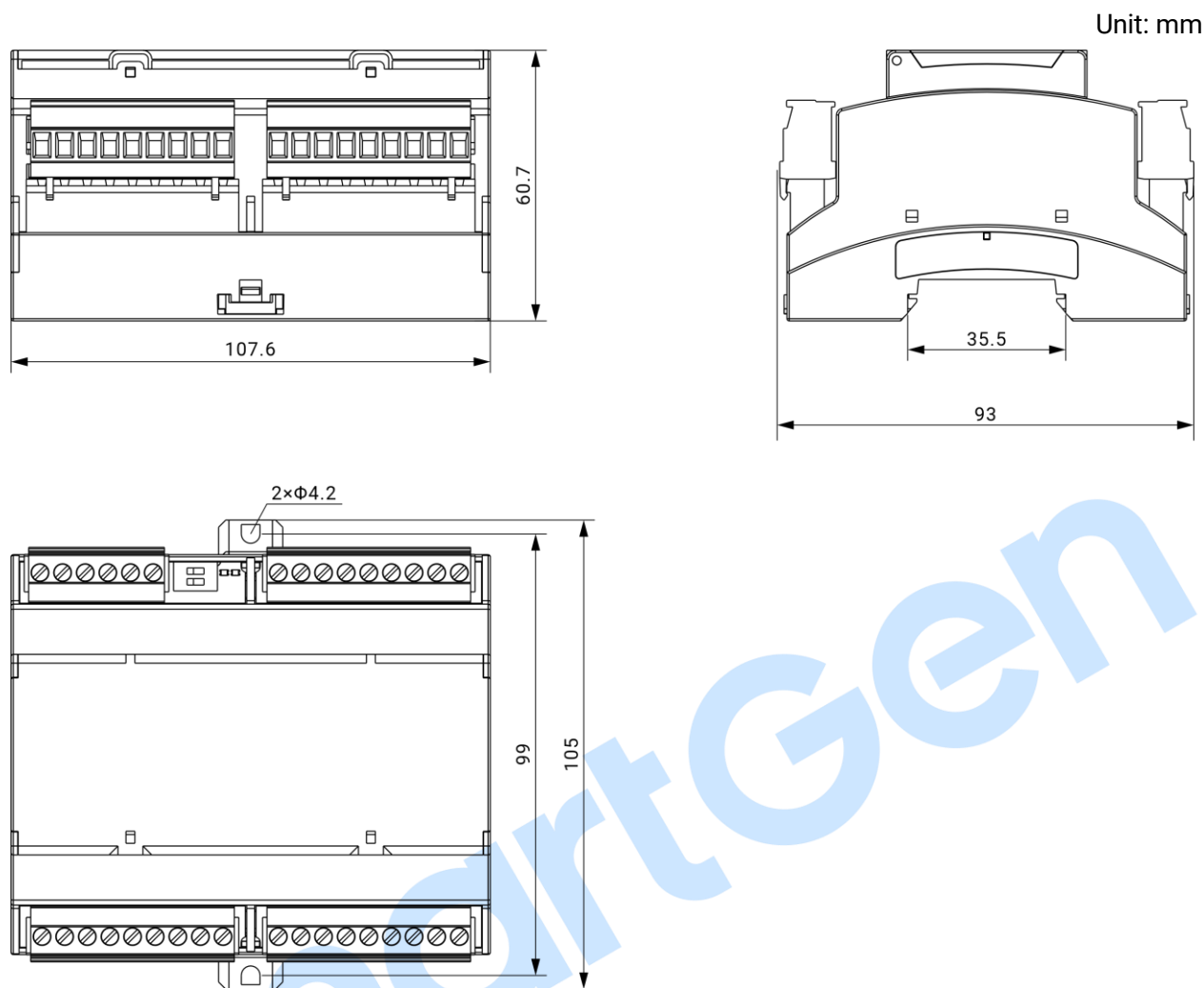


Fig.4 – Overall Dimensions

Table 5 – Troubleshooting

Fault Symptoms	Possible Solutions
Controller no response when power on	Check starting battery; Check controller wirings.
Sensor data incorrect	Check if sensor wirings are correct and the input sensor type is consistent with selected;
CANBUS communication failure	Check if CANBUS wirings are connected correctly; Check if 120Ω resistor is connected; Check if the baud rate of the DIP switch is correct.