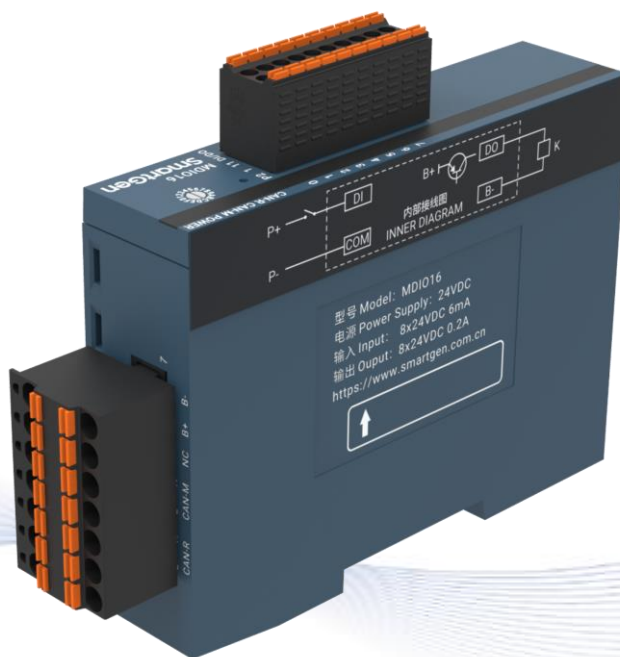




# USER MANUAL



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Table 1 Software Version

| Date       | Version | Content           |
|------------|---------|-------------------|
| 2025-11-24 | 1.0     | Original release. |
|            |         |                   |
|            |         |                   |
|            |         |                   |

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## 1 OVERVIEW

**MDIO16 Digital Input & Output Module** is an expansion module which has 8 channels of auxiliary digital input and 8 channels of auxiliary digital output. The input port status collected by MDIO16 is transmitted to the HPC300 controller for processing via CANBUS port. The MPC300 then transmits the processed output data of MDIO16 module via the CANBUS for processing.

## 2 TECHNICAL PARAMETER

**Table 2 Technical Parameter**

| Item                  | Content                               |
|-----------------------|---------------------------------------|
| Working Voltage       | DC24V continuous power supply         |
| Power Consumption     | <2W                                   |
| Input Port 0~7        | DC24V voltage input                   |
| Output Port 0~7       | B+ voltage output, rated current 0.2A |
| Case Dimension        | 123.4mm x 93.3mm x 25mm               |
| Operating Temperature | (-25~+70)°C                           |
| Operating Humidity    | (20~93)%                              |
| Storage Temperature   | (-25~+70)°C                           |
| Weight                | 0.15kg                                |

## 3 PARAMETER CONFIGURATION

The PC software of the MPC300 can configure parameters for the MDIO16 input/output ports, as detailed below:

**Table 3 Parameter Configuration List of Input Port**

| Items               | Range | Default Values | Remarks                    |
|---------------------|-------|----------------|----------------------------|
| Input 0 Function    | 0-9   | 0              | Factory default: Not used. |
| Input 0 Active Type | 0-1   | 1              | 0: Open 1: Close           |
| Input 0 Action      | 0-1   | 1              | 0: No Action 1: Warn       |
| Input 0 Delay       | 0-20s | 2s             | Input port delay           |
| Input 1 Function    | 0-9   | 0              | Factory default: Not used. |
| Input 1 Active Type | 0-1   | 1              | 0: Open 1: Close           |
| Input 1 Action      | 0-1   | 1              | 0: No Action 1: Warn       |
| Input 1 Delay       | 0-20s | 2s             | Input port delay           |
| Input 2 Function    | 0-9   | 0              | Factory default: Not used. |
| Input 2 Active Type | 0-1   | 1              | 0: Open 1: Close           |
| Input 2 Action      | 0-1   | 1              | 0: No Action 1: Warn       |
| Input 2 Delay       | 0-20s | 2s             | Input port delay           |
| Input 3 Function    | 0-9   | 0              | Factory default: Not used. |
| Input 3 Active Type | 0-1   | 1              | 0: Open 1: Close           |
| Input 3 Action      | 0-1   | 1              | 0: No Action 1: Warn       |
| Input 3 Delay       | 0-20s | 2s             | Input port delay           |
| Input 4 Function    | 0-9   | 0              | Factory default: Not used. |
| Input 4 Active Type | 0-1   | 1              | 0: Open 1: Close           |
| Input 4 Action      | 0-1   | 1              | 0: No Action 1: Warn       |
| Input 4 Delay       | 0-20s | 2s             | Input port delay           |
| Input 5 Function    | 0-9   | 0              | Factory default: Not used. |
| Input 5 Active Type | 0-1   | 1              | 0: Open 1: Close           |
| Input 5 Action      | 0-1   | 1              | 0: No Action 1: Warn       |
| Input 5 Delay       | 0-20s | 2s             | Input port delay           |
| Input 6 Function    | 0-9   | 0              | Factory default: Not used. |
| Input 6 Active Type | 0-1   | 1              | 0: Open 1: Close           |
| Input 6 Action      | 0-1   | 1              | 0: No Action 1: Warn       |
| Input 6 Delay       | 0-20s | 2s             | Input port delay           |
| Input 7 Function    | 0-9   | 0              | Factory default: Not used. |
| Input 7 Active Type | 0-1   | 1              | 0: Open 1: Close           |
| Input 7 Action      | 0-1   | 1              | 0: No Action 1: Warn       |
| Input 7 Delay       | 0-20s | 2s             | Input port delay           |

**Table 4 Parameter Configuration List of Output Port**

| Items                | Range | Default Values | Remarks                                  |
|----------------------|-------|----------------|------------------------------------------|
| Output 0 Function    | (0-7) | 0              | Factory default: Not used.               |
| Output 0 Output Type | (0-1) | 1              | 0: Normally closed;<br>1: Normally open. |
| Output 1 Function    | (0-7) | 0              | Factory default: Not used.               |
| Output 1 Output Type | (0-1) | 1              | 0: Normally closed;<br>1: Normally open. |
| Output 2 Function    | (0-7) | 0              | Factory default: Not used.               |
| Output 2 Output Type | (0-1) | 1              | 0: Normally closed;<br>1: Normally open. |
| Output 3 Function    | (0-7) | 0              | Factory default: Not used.               |
| Output 3 Output Type | (0-1) | 1              | 0: Normally closed;<br>1: Normally open. |
| Output 4 Function    | (0-7) | 0              | Factory default: Not used.               |
| Output 4 Output Type | (0-1) | 1              | 0: Normally closed;<br>1: Normally open. |
| Output 5 Function    | (0-7) | 0              | Factory default: Not used.               |
| Output 5 Output Type | (0-1) | 1              | 0: Normally closed;<br>1: Normally open. |
| Output 6 Function    | (0-7) | 0              | Factory default: Not used.               |
| Output 6 Output Type | (0-1) | 1              | 0: Normally closed;<br>1: Normally open. |
| Output 7 Function    | (0-7) | 0              | Factory default: Not used.               |
| Output 7 Output Type | (0-1) | 1              | 0: Normally closed;<br>1: Normally open. |

Table 5 PC Software Setting MDIO16 Input / Output List

| No.                | Items                  | Function Description                                                                                                                                                                                                                               |
|--------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Input Port</b>  |                        |                                                                                                                                                                                                                                                    |
| 0                  | Not Used               | Not used.                                                                                                                                                                                                                                          |
| 1                  | User-defined           | No action. This input becomes active after the active period, and its active status can be output via a custom protocol.                                                                                                                           |
| 2                  | Auto Mode              | The device type must be selected as Pump. For the Pump Mode Input, the active status corresponds to Auto mode, while the inactive status corresponds to Manual mode.                                                                               |
| 3                  | Operating Status       | The device type must be selected as Pump. Pump Running status input.                                                                                                                                                                               |
| 4                  | Stop Status            | The device type must be selected as Pump. Pump Stop status input.                                                                                                                                                                                  |
| 5                  | Fault Status           | The device type must be selected as Pump. For the Pump Fault Status Input, once this status is active, it can be cleared by performing the corresponding reset action based on the MDIO reset type.                                                |
| 6                  | Low Pressure Status    | The device type must be selected as Pump. For the Pump Pressure Status input, this status is active only after the pump is running. Once active, it can be cleared by performing the corresponding reset action based on the MDIO reset type.      |
| 7                  | Forward Status         | The device type must be selected as Fan. Forward Rotation Status input.                                                                                                                                                                            |
| 8                  | Reverse Status         | The device type must be selected as Fan. Fan Reverse Rotation Status Input.                                                                                                                                                                        |
| 9                  | Alarm Board            | The device type must be selected as Alarm Board, which allows for configuring actions with alarm and indicator functions. When the input port is active, the corresponding output port will be activated.                                          |
| <b>Output Port</b> |                        |                                                                                                                                                                                                                                                    |
| 0                  | Not Used               | Not used.                                                                                                                                                                                                                                          |
| 1                  | Start Output           | The device type must be selected as Pump. In Auto mode, the output is activated when the controller starts the pump set, and the output duration is determined by the pulse width.                                                                 |
| 2                  | Stop Output            | The device type must be selected as Pump. In Auto mode, the output time is activated when the controller stops the pump set, and the output duration is determined by the pulse width.                                                             |
| 3                  | Standby Machine        | The device type must be selected as Pump. In Auto mode, output is activated when a standby machine is present within the equipment group, and the output duration is determined by the pulse width.                                                |
| 4                  | Forward Status         | The device type must be selected as Fan. The forward rotation output duration is determined by the output pulse width (after the busbar loses power and then regains power, the output will be restored based on its state before the power loss). |
| 5                  | Reverse Status         | The device type must be selected as Fan. The reverse rotation output duration is determined by the output pulse width (after the busbar loses power and then regains power, the output will be restored based on its state before the power loss). |
| 6                  | Alarm Board Warning    | The device type must be selected as Alarm Board. When the alarm board input is active, the output port activates (a pulse output with a 1s cycle).                                                                                                 |
| 7                  | Alarm Board Indication | The device type must be selected as Alarm Board. When the alarm board input is active, the output port activates.                                                                                                                                  |

4 WRINGING CONNECTION

The panel drawing of MDIO16 is below:

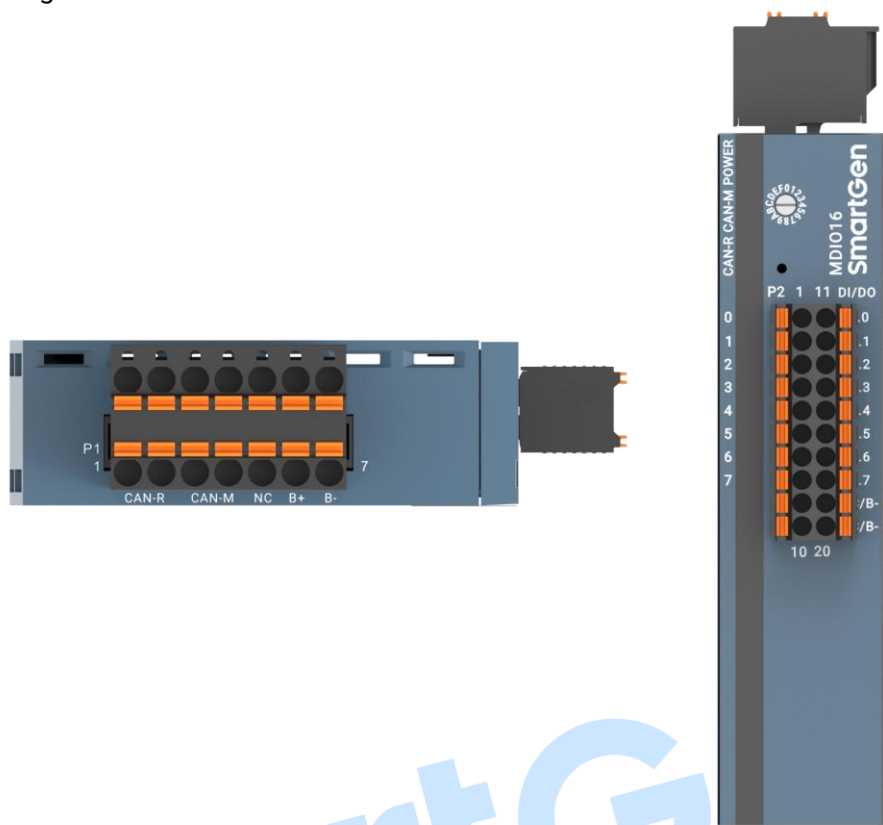


Fig.1- Panel Drawing

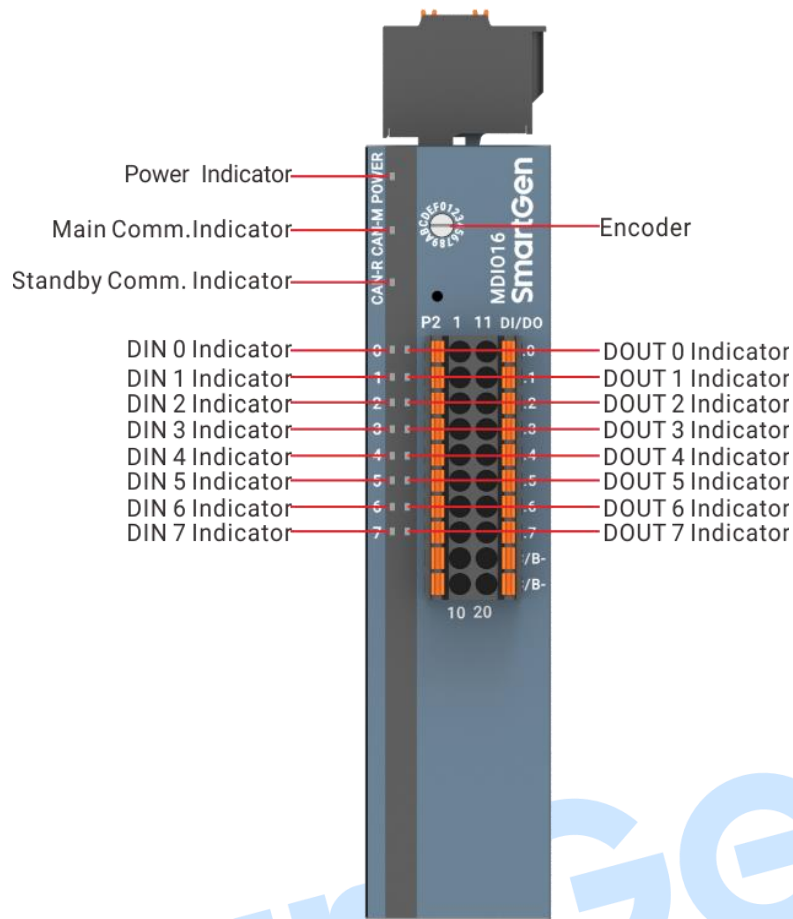


Fig.2 - Indicator Diagram

Table 6 P1 Terminal Connection

| No. | Function   | Cable Size         | Description                                                                                                                                                          |
|-----|------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.  | Reserved   | 0.5mm <sup>2</sup> | Reserved.                                                                                                                                                            |
| 2.  | Reserved   | 0.5mm <sup>2</sup> |                                                                                                                                                                      |
| 3.  | CAN-M CANL | 0.5mm <sup>2</sup> | The CANBUS communication interface should be connected to the CAN-M interface of the MPC300. Impedance-120Ω shielding wire with its one end grounded is recommended. |
| 4.  | CAN-M CANH | 0.5mm <sup>2</sup> |                                                                                                                                                                      |
| 5.  | NC         | 0.5mm <sup>2</sup> |                                                                                                                                                                      |
| 6.  | B+         | 2.5mm <sup>2</sup> | DC power supply positive input.                                                                                                                                      |
| 7.  | B-         | 2.5mm <sup>2</sup> | DC power supply negative input.                                                                                                                                      |

Table 7 P2 Terminal Connection

| No. | Function                 | Cable Size         | Description                                                                                                                                                                                                |
|-----|--------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.  | DIN 0                    | 1.0mm <sup>2</sup> | Digital input.                                                                                                                                                                                             |
| 2.  | DIN 1                    | 1.0mm <sup>2</sup> | Digital input.                                                                                                                                                                                             |
| 3.  | DIN 2                    | 1.0mm <sup>2</sup> | Digital input.                                                                                                                                                                                             |
| 4.  | DIN 3                    | 1.0mm <sup>2</sup> | Digital input.                                                                                                                                                                                             |
| 5.  | DIN 4                    | 1.0mm <sup>2</sup> | Digital input.                                                                                                                                                                                             |
| 6.  | DIN 5                    | 1.0mm <sup>2</sup> | Digital input.                                                                                                                                                                                             |
| 7.  | DIN 6                    | 1.0mm <sup>2</sup> | Digital input.                                                                                                                                                                                             |
| 8.  | DIN 7                    | 1.0mm <sup>2</sup> | Digital input.                                                                                                                                                                                             |
| 9.  | DIN COM                  | 1.0mm <sup>2</sup> | Digital input common grounded.                                                                                                                                                                             |
| 10. | DIN COM                  | 1.0mm <sup>2</sup> | Digital input common grounded.                                                                                                                                                                             |
| 11. | DOUT 0                   | 1.0mm <sup>2</sup> | Active output, DC voltage 24V, rated current 0.2A.                                                                                                                                                         |
| 12. | DOUT 1                   | 1.0mm <sup>2</sup> | Active output, DC voltage 24V, rated current 0.2A.                                                                                                                                                         |
| 13. | DOUT 2                   | 1.0mm <sup>2</sup> | Active output, DC voltage 24V, rated current 0.2A.                                                                                                                                                         |
| 14. | DOUT 3                   | 1.0mm <sup>2</sup> | Active output, DC voltage 24V, rated current 0.2A.                                                                                                                                                         |
| 15. | DOUT 4                   | 1.0mm <sup>2</sup> | Active output, DC voltage 24V, rated current 0.2A.                                                                                                                                                         |
| 16. | DOUT 5                   | 1.0mm <sup>2</sup> | Active output, DC voltage 24V, rated current 0.2A.                                                                                                                                                         |
| 17. | DOUT 6                   | 1.0mm <sup>2</sup> | Active output, DC voltage 24V, rated current 0.2A.                                                                                                                                                         |
| 18. | DOUT 7                   | 1.0mm <sup>2</sup> | Active output, DC voltage 24V, rated current 0.2A.                                                                                                                                                         |
| 19. | DOUT COM B-              | 1.5mm <sup>2</sup> | Active output common grounded.                                                                                                                                                                             |
| 20. | DOUT COM B-              | 1.5mm <sup>2</sup> | Active output common grounded.                                                                                                                                                                             |
|     | Encoder                  |                    | Address Selection: 0~F correspond to addresses 0 ~15 respectively.                                                                                                                                         |
|     | Digital Input Indicator  |                    | When the DIN0~DIN7 input ports are active, the corresponding DIN0~DIN7 indicators light on.                                                                                                                |
|     | Digital Output Indicator |                    | When the DOUT0~DOUT7 output ports are active, the corresponding DOUT0~DOUT7 indicators light on.                                                                                                           |
|     | Main Comm. Indicator     |                    | 10Hz flashing: Communication normal;<br>1Hz flashing: same addresses of the two MDIO16 modules;<br>Light off: No control command received within the timeout period;<br>Light on: CAN connection abnormal. |

5 MDIO16 TYPICAL APPLICATION DIAGRAM

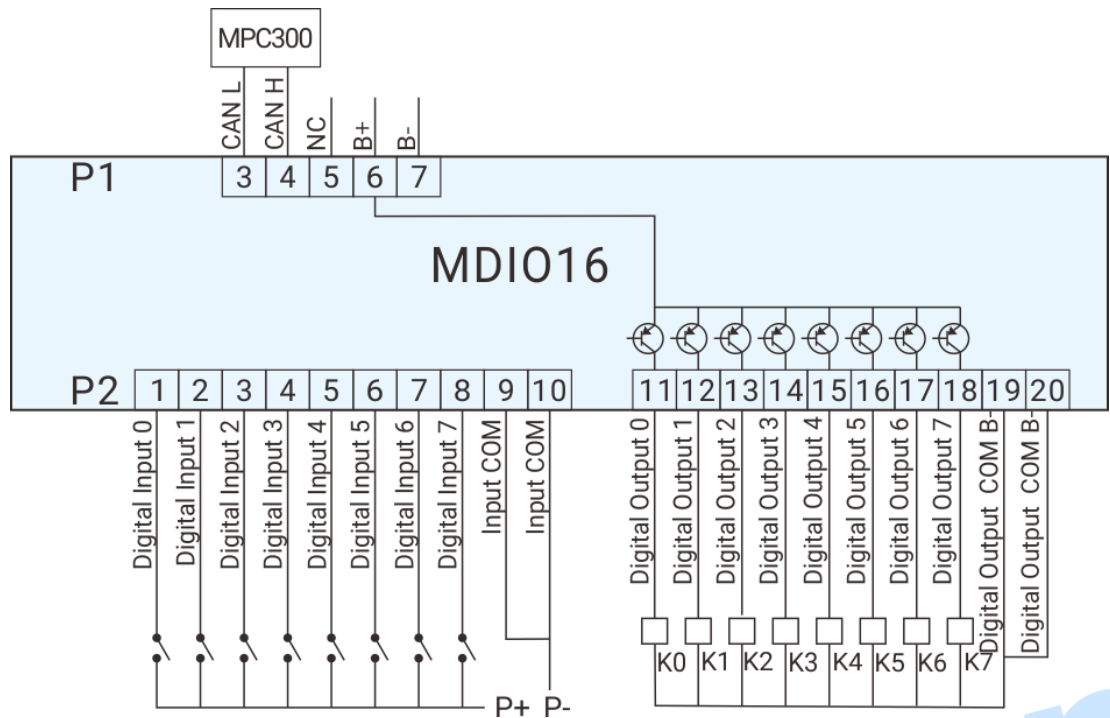


Fig.3 - Typical Application Diagram

6 INSTALLATION

Case dimension:

Unit:mm

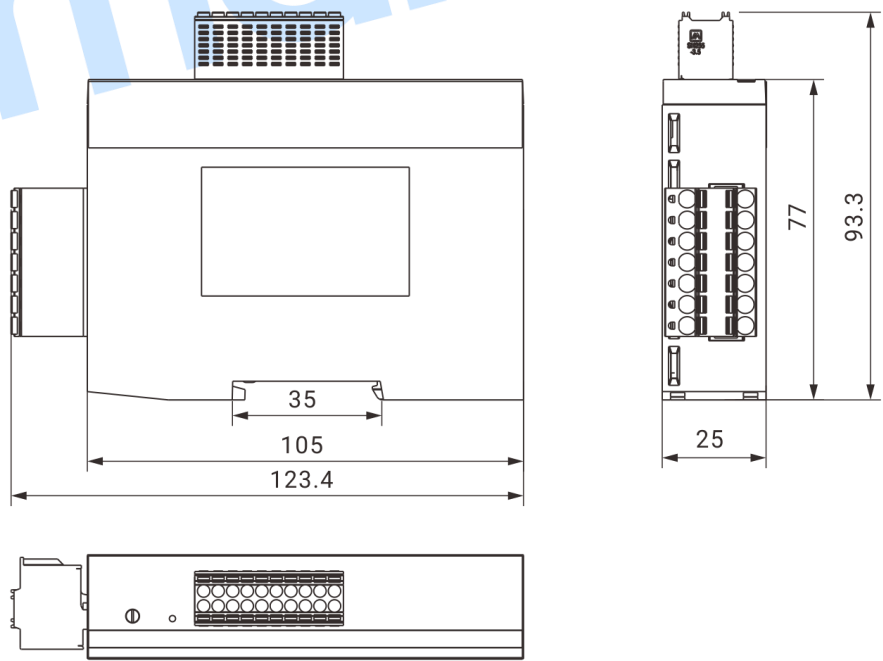


Fig.4 - Installation Dimensions

**Table 8 Troubleshooting**

| Symptom                           | Possible Solution                                                                 |
|-----------------------------------|-----------------------------------------------------------------------------------|
| Controller no response with power | Check whether the power supply is normal;<br>Check controller connection wirings. |
| CANBUS communication failure      | Check whether the CANBUS wiring is correct.                                       |

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