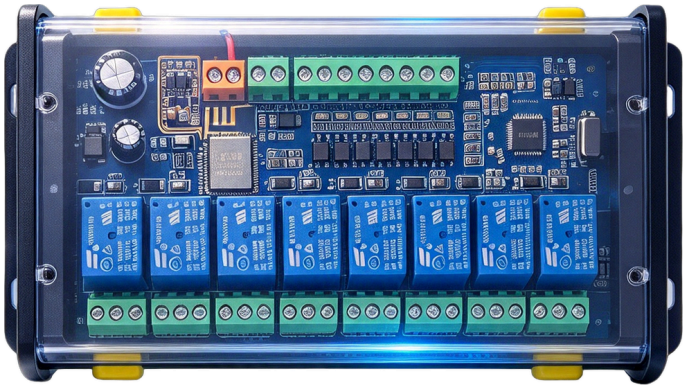
Product Manual

8-Channel Digital I/O Controller

Model · RDIO808

Product version · V1.0



1. Product Overview

RDIO808 is an industrial-grade digital input/output control module. It supports 1~8 channels of digital input detection and relay output control, utilizing an RS485 communication interface and the standard Modbus RTU protocol. It features optical isolation, strong anti-interference capabilities, and multiple working modes. It supports an optional HA version, allowing seamless integration into smart home systems, and is widely used in scenarios such as industrial automation and the Internet of Things.

2. Features

- Multi-channel I/O: Supports 1~8 channels of digital (high/low level) input detection; supports 1~8 channels of digital (relay) output control.
- Wide Compatibility: Input signal types support PNP (high-level trigger) or NPN (low-level trigger); inputs support both dry contacts (passive switches/mechanical switches) and wet contacts (active sensors).
- Industrial-grade Protection: Uses bidirectional optocoupler isolation for inputs, with a communication isolation voltage of 3000V; features anti-static, lightning surge, and anti-interference capabilities; both power and communication have reverse polarity protection and overcurrent protection.
- Stable and Reliable: Built-in dual hardware and software watchdogs ensure it never crashes.
- Active Upload: Supports active upload of input port status changes, facilitating real-time synchronization with the host computer.
- Power-off Retention: Supports modification of communication address (1~255) and baud rate (4800~115200bps), with settings retained after power loss.
- HA Integration (Optional): Supports an optional HA (Home Assistant) version, easily integrating into the system via ESP. Supports the MQTT protocol, enabling remote control and scene linkage, and allowing intelligent collaboration with devices such as lights and curtains.

3. Application Scenarios

1. Industrial Automation: Signal acquisition for production line equipment and remote on/off control of relays.

2. Power Systems: Status monitoring of power distribution cabinets and remote switch control.

3. Smart Home and IoT: With the optional HA version, it can be seamlessly integrated into the Home Assistant system to achieve smart linkage and remote control of appliances such as lighting and curtains.

4. Security and Traffic Systems: Access control status collection, remote barrier gate control, and alarm signal input.

4. Structural Interfaces

- Terminal blocks: Power terminals (+, -), Communication terminals (A, B), Input common terminal (COM), Signal input terminals (X), Output terminals (NO, NC, COM).

Technical Parameters

Parameter	Parameter Value
Product Name	8-Channel Digital I/O Controller
Model	RDIO808
Brand	SMRTE
Supply Voltage	DC12V
Input Voltage/Current	DC12V
Rated Power/Power Consumption	Relay approx. 35mA/channel, Digital Input approx. 9mA/channel
Communication Protocol/Band/Rate	Standard Modbus RTU
Dimensions	156 × 84 × 50 mm
Weight	500 g
Operating Temperature	-40℃ ~ +85℃
Operating Humidity/Protection Rating	0% ~ 95% (non-condensing)
Protection Functions	Overcurrent / Overvoltage / Reverse Polarity / Lightning Surge
Packing List	8-Channel Digital I/O Controller RDIO808 x 1

6. Installation and Wiring

Wiring Label Description:

- +: Power Supply Positive Terminal
- -: Power Supply Negative Terminal
- A: RS485+ / TTL+
- B: RS485- / TTL-

- COM: Output common terminal / Input common terminal
- NO: Output normally open terminal
- NC: Output normally closed terminal
- X: Signal input terminal

Wiring method:

- NPN type input: Connect the input common terminal (COM) to the positive power supply, and the signal input terminal to the sensor or switch.
- PNP type input: Connect the input common terminal (COM) to the negative power supply, and the signal input terminal to the sensor or switch.
- Relay output: Connect the normally open load to NO and COM, and the normally closed load to NC and COM.

7. Configuration and Usage

1. Connect the module to a computer or host computer via the RS485 interface.

2. The default communication parameters are: address 1, baud rate 38400, data bits 8, stop bits 1, no parity.

3. Use the accompanying test software or self-written Modbus commands to read and modify parameters.

4. Modifiable parameters include: device address (1~255), baud rate, communication detection time, active upload mode, and the working mode of each channel.

5. After modifying the device address and baud rate, the device must be powered on again or the corresponding communication settings must be modified in the software to continue communication.

8. Communication Protocol

This product adopts the standard Modbus RTU communication protocol and supports the following function codes:

- 0x01 Read coil status (read output port status)
- 0x02 Read discrete input status (read input port trigger status)
- 0x03 Read holding registers (read parameter configuration)
- 0x04 Read input registers (read input port status)
- 0x05 Write single coil (control single output)
- 0x06 Write single holding register (modify parameter)
- 0x0F Write Multiple Coils (Batch Control Outputs)

- 0x10 Write Multiple Holding Registers (Batch Parameter Modification)

Register Description:

- Coil Registers (0x01/0x05): Used to control relay outputs, e.g., 0000H corresponds to Channel 1. Write 1 to turn on, write 0 to turn off.
- Discrete Input Registers (0x02): Read-only, used to read input port trigger status. A value of 1 indicates triggered, 0 indicates not triggered.
- Input Registers (0x04): Read-only, function is the same as discrete inputs.
- Holding Registers (0x03/0x06): Used for parameter configuration.
- 0032H: RS485 Bus Address/Station Number (1~255)
- 0033H: Baud Rate Setting (0:4800, 1:9600, 2:14400, 3:19200, 4:38400(default), 5:56000, 6:57600, 7:115200)
- 0034H: Batch Control Outputs (0 all off, 1 all on)

Communication Command Examples (Hexadecimal Format):

- Example 1: Read input status of Channels 1~3
- Send frame: 01 04 00 00 00 03 B0 0B
- Return frame: 01 04 06 00 01 00 01 00 00 0C 93
- Parsing: Channel 1 triggered, Channel 2 triggered, Channel 3 not triggered.
- Example 2: Modify device address to 2
- Send frame: 01 06 00 32 00 02 A9 C4
- Return frame: 01 06 00 32 00 02 A9 C4
- Note: Power cycle required for changes to take effect.
- Example 3: Modify baud rate to 38400
- Send frame: 01 06 00 33 00 04 78 06
- Return frame: 01 06 00 33 00 04 78 06
- Note: Power cycle required for changes to take effect.

9. Applicable Conditions and Limitations

- Environmental limits: Please use in an environment with an operating temperature of -40℃~+85℃ and humidity of 0%~95% (non-condensing).
- Parameter activation: After modifying holding register parameters such as address and baud rate, they are saved upon power loss and take effect after power is restored.

10. Safety Maintenance

- Do not perform wiring or disassembly operations while the device is powered on.
- Power supply and communication cables must be connected correctly according to terminal markings to avoid reverse connection (the module has reverse connection protection, but standard operating procedures must still be followed).
- When wiring the high-voltage output terminals (relay terminals), please pay attention to electrical safety to avoid electric shock or short circuits.

11. Packing List

- 8-Channel Digital I/O Controller RDIO808 x 1

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