

eletechsup N4IOA01

eletechsup N4IOA01 DC 12V RS485 to 4-20mA/0-20mA Current
Signal Generator DAC Converter Module User Manual

1. PRODUCT OVERVIEW

The eletechsup N4IOA01 is a compact and efficient DC 12V RS485 to 4-20mA/0-20mA Current Signal Generator DAC Converter Module. Designed for industrial applications, this module facilitates communication between control systems (like PLCs) and measuring instruments using the Modbus RTU protocol. It converts digital commands received via RS485 into a precise analog current output (0-20mA or 4-20mA), making it ideal for sensor simulation, process control, and automated testing.

The module supports Modbus RTU commands (function codes 03 and 06) and can be integrated into systems with up to 247 parallel devices by adjusting the RS485 address. Its high resolution and accuracy ensure reliable performance in demanding environments.

2. KEY FEATURES

- Single-channel 4-20mA/0-20mA Current Signal Generator.
- PWM to Current Analog Converter (DAC) Module.
- Supports RS485 Modbus RTU 03 and 06 commands.
- Addressable for up to 247 modules in parallel (RS485 repeater recommended for more than 16 devices).
- Compatible with PLC configuration software.

3. SPECIFICATIONS

Specification	Value
Operating Voltage	DC 12V (DC 12-25V recommended)
Operating Current	12-32mA (related to output current)
Output Current Range	0.50-21.00mA (for 4-20mA)
Maximum Output Current Capability	21mA
Current Resolution	0.01mA
Output Accuracy	1% (calibratable if error exceeds 1%)

Specification	Value
MODBUS Command Support	03, 06 function codes
Max Parallel Devices (MODBUS)	247 (with RS485 repeater for >16 devices)
Open Circuit Output Voltage	10V (at current output terminal)
Dimensions	45 x 35 x 15mm
Weight	10g
Model Number	N4IOA01

4. SETUP AND WIRING

Proper setup and wiring are crucial for the correct operation of the N4IOA01 module. Ensure all connections are secure and power is supplied within the specified range.

4.1. Power Supply Connection

Connect a DC 12V power supply to the module's power input terminals. The recommended operating voltage range is DC 12-25V. A power supply with minimal ripple is advised for stable performance.

4.2. RS485 Communication Connection

Connect the RS485 A and B lines from your control device (e.g., PLC, serial assistant) to the corresponding RS485 terminals on the module. Ensure correct polarity (A to A, B to B) to establish communication.

4.3. Current Output Connection

Connect the current output terminals of the module to the input of your measuring instrument or load. The module provides a 0-20mA or 4-20mA current signal. The open-circuit voltage at the current output terminal is 10V.

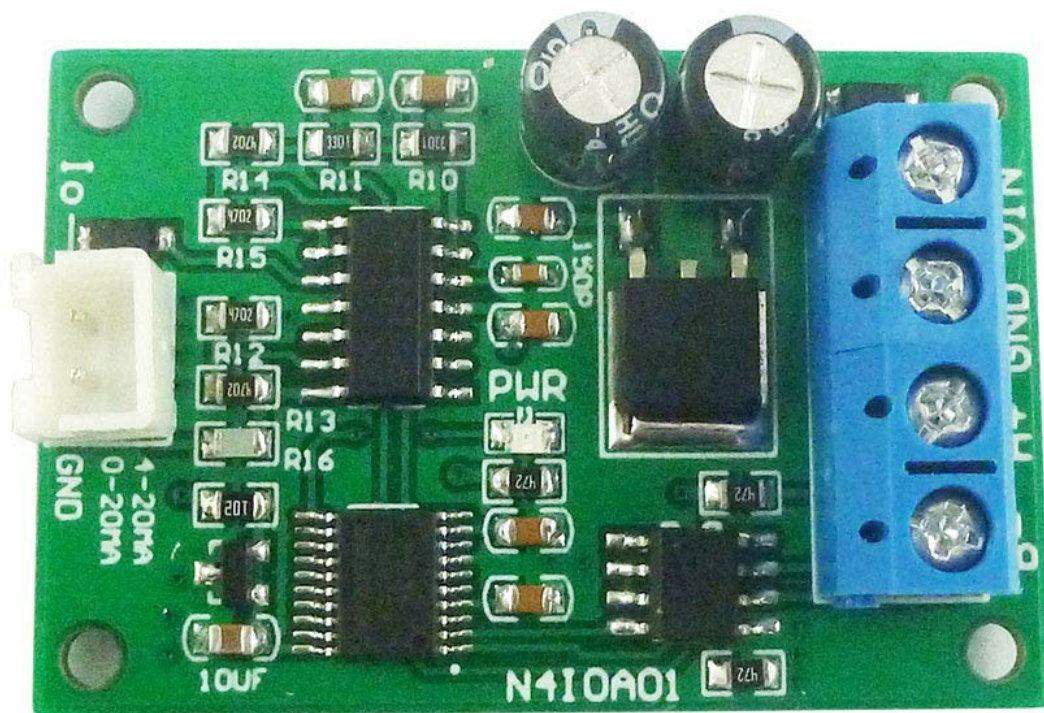


Figure 1: eletechsup N4IOA01 DC 12V RS485 to 4-20mA/0-20mA Current Signal Generator DAC Converter Module. This image shows the compact design of the module with its terminal blocks for power, RS485 communication, and current output.

5. OPERATING INSTRUCTIONS

The N4IOA01 module is controlled via Modbus RTU commands sent over the RS485 interface. You can use a serial HyperTerminal (serial assistant) or a PLC to send these commands.

5.1. Modbus RTU Commands

The module supports Modbus RTU function codes 03 (Read Holding Registers) and 06 (Write Single Register). These commands are used to read the current output status or to set a new output current value.

- **Function Code 06 (Write Single Register):** Used to set the desired output current. The current value is typically represented as an integer, where 100 corresponds to 1.00mA, 400 to 4.00mA, and 2000 to 20.00mA. Refer to the specific Modbus register map for the module for exact addresses and data formats.
- **Function Code 03 (Read Holding Registers):** Used to read the current output value or other status registers from the module.

Before operation, ensure the module's RS485 address is correctly configured, especially when multiple modules are connected in parallel. The address can be modified via Modbus commands.

5.2. Setting Output Current

To set the output current, send a Modbus RTU command with function code 06 to the appropriate register address. For example, to set a 4mA output, you would send the corresponding data value (e.g., 400 if the scaling is 100 units per mA). The module will then generate the specified current within its 0.50-21.00mA range.

6. MAINTENANCE

The eletechsup N4IOA01 module is designed for reliable operation with minimal maintenance. However, following these guidelines can help ensure its longevity and performance:

- **Environmental Conditions:** Operate the module within its specified temperature and humidity ranges. Avoid exposure to excessive dust, moisture, or corrosive substances.
- **Power Supply:** Always use a stable DC 12-25V power supply with low ripple. Unstable power can affect accuracy and module lifespan.
- **Connections:** Periodically check all wiring connections (power, RS485, output) to ensure they are secure and free from corrosion or damage.
- **Cleaning:** If necessary, gently clean the module with a soft, dry cloth. Do not use liquid cleaners or solvents.

7. TROUBLESHOOTING

If you encounter issues with the N4IOA01 module, consider the following troubleshooting steps:

- **No Power/Module Not Responding:**
 - Verify the DC 12V power supply is connected correctly and providing the specified voltage.
 - Check for loose power connections.
- **Communication Errors (RS485):**
 - Ensure RS485 A and B lines are connected with correct polarity.
 - Verify the Modbus address of the module matches the address used in your commands.
 - Check communication parameters (baud rate, data bits, stop bits, parity) in your serial assistant or PLC.
 - If using multiple modules, ensure each has a unique Modbus address.
- **Incorrect Current Output:**
 - Confirm the Modbus command sent for setting the current is correct, including the register address and data value.
 - Check the load connected to the output terminals. Ensure it is within the module's capabilities.
 - If the output accuracy error is consistently greater than 1%, the module may require calibration. Refer to advanced configuration guides or contact support for calibration procedures.
 - Ensure the power supply is stable and free from excessive noise.

8. WARRANTY AND SUPPORT

For specific warranty information, technical support, or detailed instruction manuals beyond this overview, please contact eletechsup directly after purchase. The manufacturer is committed to providing assistance for product setup, operation, and any issues you may encounter.

ASK A QUESTION ABOUT THIS MANUAL

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