EMCONRTOL AMDSG08

EMCONRTOL 8-Channel DS18B20 Temperature Acquisition Module

Model: AMDSG08

1. Introduction

This manual provides comprehensive instructions for the EMCONRTOL 8-Channel DS18B20 Temperature Acquisition Module, Model AMDSG08. This device is designed for industrial and consumer applications requiring precise temperature monitoring and data acquisition via RS485 Modbus RTU protocol. It supports up to eight DS18B20 temperature sensors and features 3000V optical isolation for robust communication.

2. Package Contents

- 1 x EMCONRTOL DC 12V 24V 8-Channel RS485 DS18B20 Temperature Collector Module

Note: DS18B20 sensors are typically sold separately unless specified in the product variant.

3. Features

- **8-Channel DS18B20 Input:** Supports simultaneous connection of up to eight DS18B20 temperature sensors.
- **RS485 MODBUS RTU Protocol:** Standard communication protocol for integration with configuration software, PLCs, or industrial touch panels.
- **Wide Operating Voltage:** DC 7-25V (compatible with 9V, 12V, 24V systems).
- **Optical Isolation:** 3000VDC RS485 communication isolation protection for enhanced reliability and interference immunity.
- **Temperature Range:** Measurable range from -55°C to +125°C (-67°F to +257°F).
- **High Accuracy:** ±0.5°C accuracy within the -10°C to 85°C range.
- **Configurable Baud Rates:** Supports 1200, 2400, 4800, 9600 (default), 19200, 38400, 57600, 115200 bps.
- **Parity Options:** No parity (default), Even parity, Odd parity.
- **DIN Rail Installation:** Standard DIN rail mounting for easy integration into control cabinets.

4. Specifications

Parameter	Value
Working Voltage	DC 7-25V (9V, 12V, 24V)
Working Current	8-50mA
Sensor Type	DS18B20 (up to 8 channels)
Temperature Range	-55°C to +125°C (-67°F to +257°F)
Temperature Accuracy	±0.5°C (-10°C to 85°C)
Communication Protocol	RS485 MODBUS RTU
Isolation Protection	3000VDC for RS485
Supported Baud Rates	1200, 2400, 4800, 9600 (default), 19200, 38400, 57600, 115200 bps
Parity Settings	No parity (default), Even parity, Odd parity
Installation Method	Standard DIN rail installation
Dimensions (L×W×H)	125 × 70 × 30 mm (4.92 × 2.76 × 1.18 inches)
Weight	114 grams (4.02 ounces)

5. Interface Definition

The module features clearly labeled terminals for power, DS18B20 sensor connections, and RS485 communication. Refer to the diagram below for a visual representation of the interface.

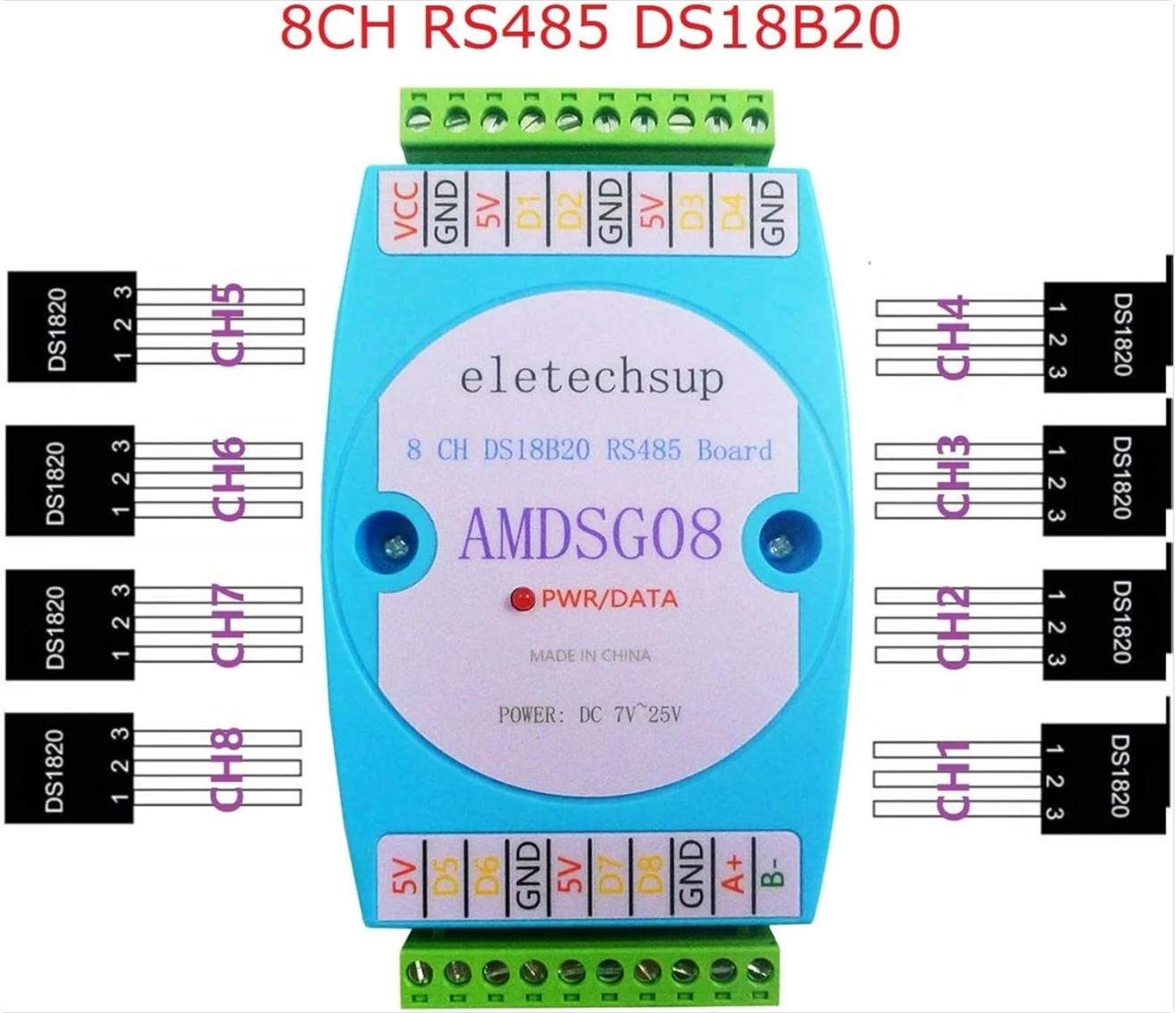

Figure 1: EMCONRTOL AMDSG08 Module Interface Layout

Terminal	Description
VCC	Power input positive (+)
GND	Power input negative (-)
5V	DS18B20 sensor power supply positive (+)
GND (DS18B20)	DS18B20 sensor power supply negative (-)
D1 - D8	DS18B20 channel 1 to 8 data ports
A+	RS485 signal A+
B-	RS485 signal B-

6. Setup and Wiring

Follow these steps to connect the EMCONRTOL module and DS18B20 sensors:

1. **Power Connection:** Connect your DC 7-25V power supply to the VCC (+) and GND (-) terminals of the module. Ensure correct polarity.
2. **DS18B20 Sensor Connection:** Each DS18B20 sensor typically has three wires: VCC (power), GND (ground),

and DATA. Connect the sensor's VCC to the module's 5V terminal, the sensor's GND to the module's DS18B20 GND terminal, and the sensor's DATA wire to one of the D1-D8 data ports. You can connect up to eight sensors, each to a dedicated D port.

3. **RS485 Communication:** Connect the RS485 A+ line from your master device (e.g., PLC, computer with RS485 converter) to the module's A+ terminal. Connect the RS485 B- line from your master device to the module's B- terminal.

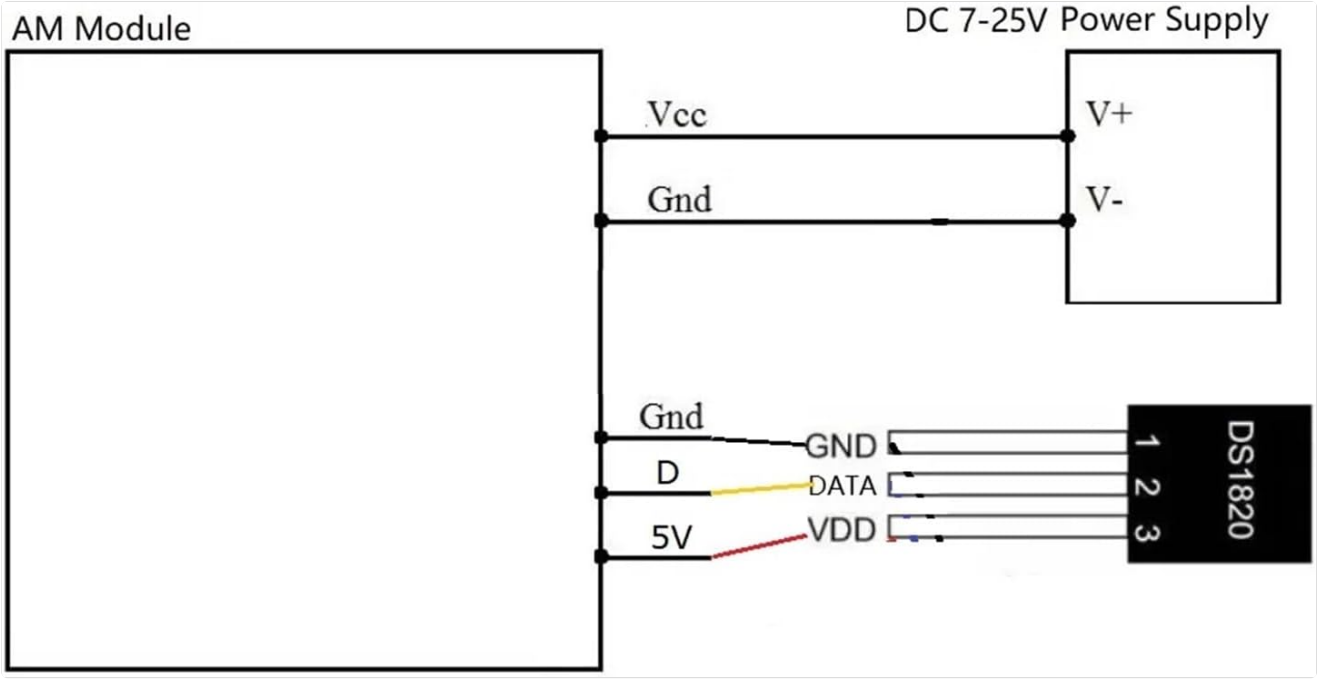

Figure 2: Basic Wiring Diagram for DS18B20 Sensor to Module

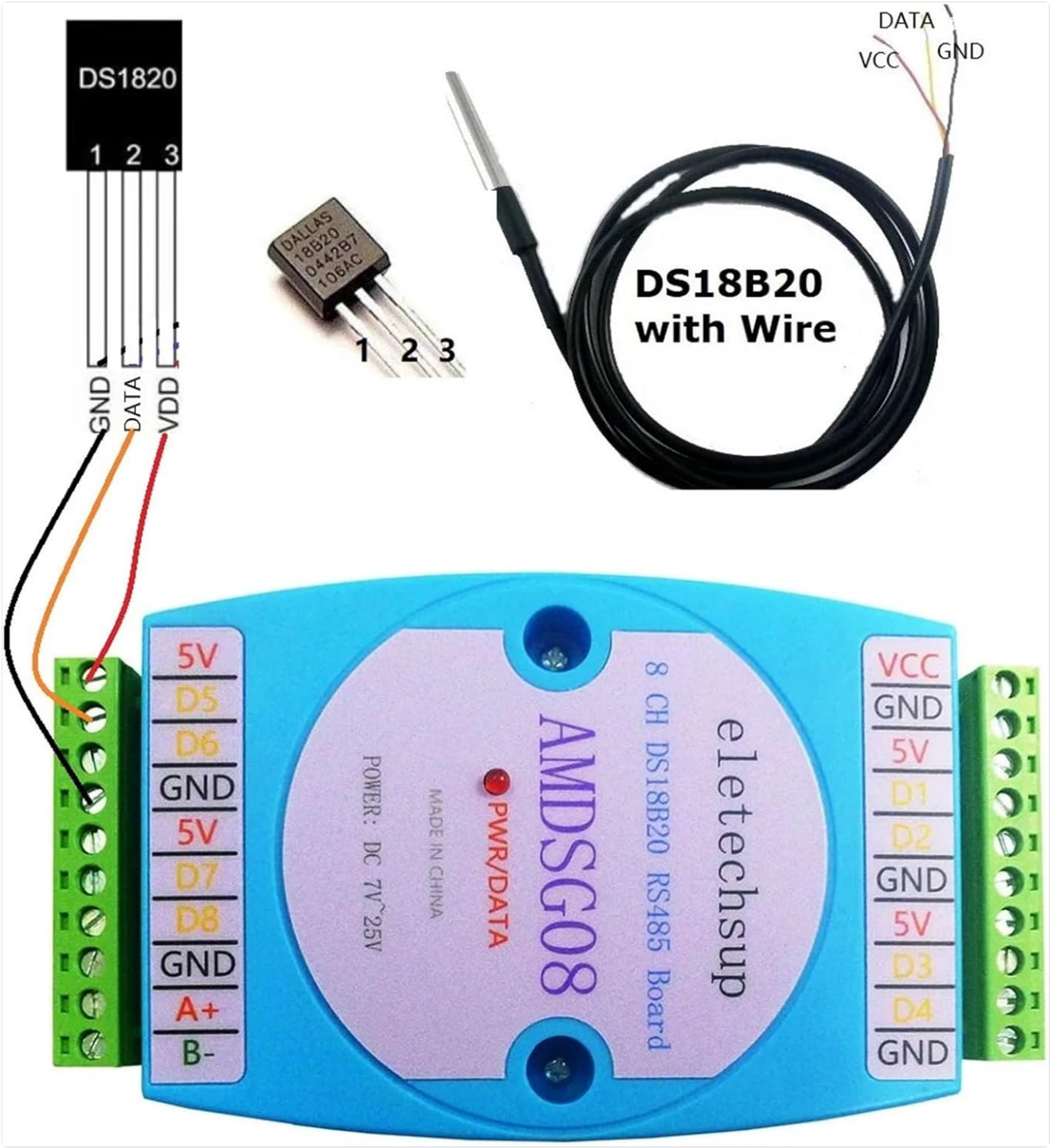

Figure 3: DS18B20 Sensor and Module Connection Overview

Figure 4: Example of a DS18B20 Temperature Sensor

7. Operation

The EMCONRTOL module communicates using the standard MODBUS RTU protocol over RS485. After proper wiring, you can interact with the module using a Modbus master device.

7.1. Modbus Commands

The module supports standard Modbus RTU commands for reading and writing data:

- **Function Code 03/04:** Read Holding Registers / Read Input Registers (for reading temperature data).
- **Function Code 06/16:** Write Single Register / Write Multiple Registers (for configuring module parameters if applicable, though primarily for data acquisition).

Refer to the module's specific Modbus register map (not provided in this document) for details on how to access temperature data from each DS18B20 channel.

7.2. Communication Parameters

Ensure your Modbus master device is configured with the correct communication parameters:

- **Baud Rate:** Select from 1200, 2400, 4800, 9600 (default), 19200, 38400, 57600, 115200 bps.
- **Parity:** No parity (default), Even parity, or Odd parity.
- **Data Bits:** Typically 8.
- **Stop Bits:** Typically 1.

The module's default settings are 9600 bps, No parity, 8 data bits, 1 stop bit.

8. Applications

This module is suitable for a wide range of temperature monitoring and control applications, including:

- Thermostatic Controls
- Industrial Automation Systems
- Consumer Products requiring temperature sensing
- Digital Thermometers
- Thermally Sensitive Systems
- Indoor and Outdoor Temperature Measurement
- Environmental Monitoring (e.g., vegetable gardens, weather stations)

9. Maintenance

The EMCONRTOL module is designed for reliable operation with minimal maintenance. To ensure longevity and accurate performance:

- Keep the module in a clean, dry environment, free from excessive dust and moisture.
- Avoid exposing the module to extreme temperatures outside its specified operating range.
- Periodically check all wiring connections to ensure they are secure.
- Do not attempt to open the module casing, as this may void any warranty and expose internal components to damage.

10. Troubleshooting

If you encounter issues with the module, consider the following:

- **No Power/Indicator Off:** Verify the DC 7-25V power supply is correctly connected and providing the specified voltage. Check for loose connections.
- **No Communication:**
  - Ensure RS485 A+ and B- lines are correctly connected to the master device.
  - Verify that the Modbus master's communication parameters (baud rate, parity, data bits, stop bits) match the module's settings (default: 9600, N, 8, 1).
  - Check for proper termination resistors on the RS485 bus if applicable in your setup.
  - Confirm the module's Modbus slave address is correctly configured and matches the master's request.
- **Incorrect Temperature Readings:**
  - Ensure DS18B20 sensors are correctly wired to their respective data ports (D1-D8), 5V, and GND.
  - Check the integrity of the sensor cables.
  - Verify that the Modbus master is reading the correct register addresses for temperature data.

For further assistance, please contact EMCONRTOL customer support.

11. Warranty and Support

EMCONRTOL products are manufactured to high-quality standards. For warranty information and technical support, please refer to the product packaging or contact your retailer. Keep your purchase receipt as proof of purchase.