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› SainSmart USB 8-Channel 12V Relay Board Instruction Manual

SainSmart 8541582310

SainSmart USB 8-Channel 12V Relay Board Instruction Manual

Model: 8541582310

1. INTRODUCTION

This manual provides detailed instructions for the setup, operation, maintenance, and troubleshooting of the SainSmart USB 8-Channel 12V Relay Board. Please read this manual thoroughly before using the device to ensure proper functionality and safety.

2. PRODUCT OVERVIEW

The SainSmart USB 8-Channel 12V Relay Board is designed for automation applications, allowing control of up to eight independent circuits via a USB connection. It features robust SPDT relays and is engineered with enhanced voltage isolation and high-current tracks for reliable performance.

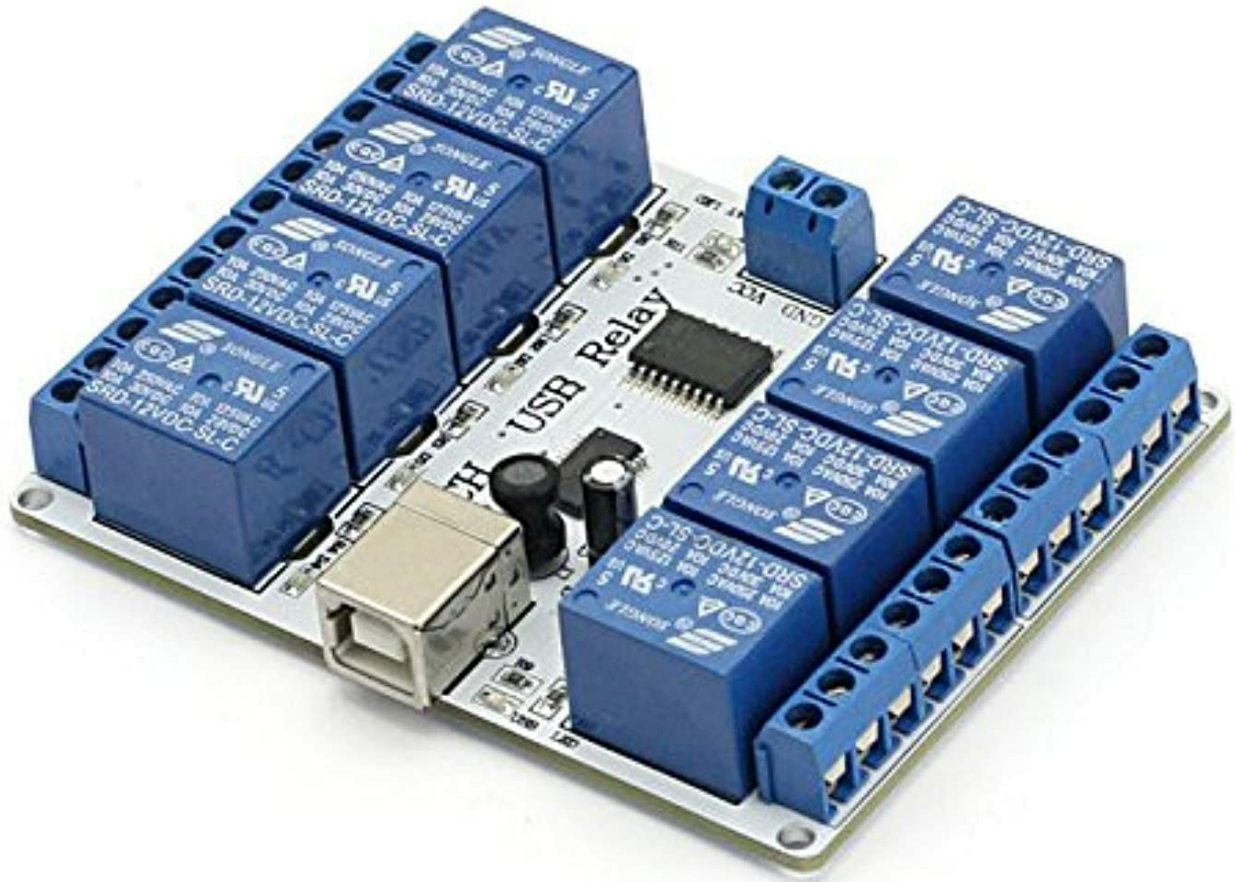


Figure 1: Angled view of the SainSmart USB 8-Channel 12V Relay Board.

3. FEATURES

- **8 SPDT Relays:** Equipped with SRD-12VDC-SL-C relays, providing single-pole, double-throw switching capabilities.
- **Software Support:** Compatible with SainSmart's dedicated control software for easy operation.
- **Enhanced Voltage Isolation:** Features extra PCB openings to improve isolation between circuits.
- **Doubled High Current Tracks:** Designed with reinforced tracks to handle higher current loads reliably.

4. SPECIFICATIONS



Figure 2: Top-down view of the relay board, highlighting components and connection points.

Specification	Value
Connector Type	Solder
Contact Material	Copper
Contact Type	SPDT
Current Rating	10 Amps
Mounting Type	Panel Mount
Operation Mode	Automatic
Wattage	120 watts
Coil Voltage	12 Volts
Maximum Switching Current	10 Amps
Maximum Switching Voltage	12 Volts
Minimum Switching Voltage	11 Volts
Product Dimensions	4.8 x 3.7 x 1.26 inches
Item Weight	4.2 ounces

5. SETUP

1. **Driver and Software Installation:** Obtain the necessary drivers and control software from the official SainSmart website. Install these on your computer (e.g., Windows 10, Linux). The software package typically includes the required drivers.

2. **Connect USB Cable:** Connect the relay board to your computer using a standard USB cable (not included). Ensure the connection is secure.
3. **Power Supply:** Connect a 12V DC power supply to the board's VCC and GND terminals. The relay coils operate from this 12V source.
4. **Wiring Relays:** Wire your target devices to the relay terminals. Each relay has three terminals: Common (COM), Normally Open (NO), and Normally Closed (NC). Refer to the specific wiring diagram for your application.
5. **Initial Software Launch:** Launch the SainSmart control software (e.g., 'Relay Manager'). This initial launch may be necessary to properly initialize the board and establish communication, especially if using custom programming later.

***Note:** The board does not include a USB cable. Ensure you have a compatible cable for connection.*

6. OPERATING INSTRUCTIONS

The SainSmart USB 8-Channel 12V Relay Board operates primarily through software commands. The board uses a bit-bang method for relay control.

6.1. Using SainSmart Control Software

The official SainSmart control software (e.g., 'Relay Manager') provides a straightforward interface for controlling the relays. Install and launch the software as described in the Setup section. The software should detect the board and allow you to toggle individual relays.

6.2. Custom Programming and Bit-Bang Protocol

For custom applications (e.g., using LabVIEW, Python, or other programming languages), direct communication with the board is possible. The relays are controlled by sending a single byte of data, where each bit corresponds to a relay's state (0 for off, 1 for on).

- **Binary Representation:** The state of the eight relays is represented by an 8-bit binary number (0-255 decimal, 00-FF hexadecimal).
- **Example:**
 - To turn on Relay #1 (all others off): Send **00000001** (decimal 1, hex 01).
 - To turn on Relays #1, #3, #4, #6 (others off): Send **00101101** (decimal 45, hex 2D).
 - To turn on all relays: Send **11111111** (decimal 255, hex FF).
- **Initial Handshake:** Some users report that the board requires an initial handshake or initialization by the official SainSmart software before it can be controlled by custom applications. Running the official software once and then closing it may leave the board in a state where custom code can communicate with it. Alternatively, direct calls to the FTDI DLL library can be used to put the board into the proper mode for advanced users.

7. MAINTENANCE

The SainSmart USB 8-Channel 12V Relay Board is designed for durability. Regular maintenance is minimal but important for longevity:

- **Keep Clean and Dry:** Ensure the board is kept in a clean, dry environment, free from dust and moisture.
- **Inspect Connections:** Periodically check all wiring connections for tightness and signs of wear or corrosion.
- **Avoid Physical Stress:** Do not subject the board to excessive physical stress or impact.

8. TROUBLESHOOTING

- **USB Disconnections:** If the board frequently disconnects from USB, ensure that any solenoids or contactors connected to the relays are properly wired with flyback diodes. Inductive loads can generate transient voltages that interfere with USB communication or damage the board.
- **Relays Not Actuating/LEDs Not Illuminating:** This can occur if significant transients are generated by connected loads, potentially affecting the relay drivers or the USB interface. Ensure proper transient suppression for all connected inductive loads.
- **Communication Issues with Custom Code:** If your custom application cannot communicate with the board, try the following:
 - First, run the official SainSmart 'Relay Manager' software, ensure it connects, then close it. This often initializes the board for subsequent custom control.
 - Verify that the board is in bit-bang mode. The communication protocol is typically a single byte representing the relay states, not a multi-byte command sequence like "xFF x04 x01".
 - Ensure all necessary FTDI drivers and libraries are correctly installed and accessible by your programming environment.
- **Unexpected Relay Toggling on Power-Up:** Some users have reported that the board may toggle all channels multiple times upon power-up. This behavior can potentially cause damage to connected equipment. Consider implementing a power-up delay or a controlled power sequence for sensitive applications.

9. SUPPORT & WARRANTY

For technical support, driver downloads, or further assistance, please visit the official SainSmart website or contact their customer service. Information regarding product warranty can typically be found on the SainSmart website or through your point of purchase.

Manufacturer: SainSmart

Model Number: 8541582310

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Example: How do I reset this device or fix this error?

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Model number, symptoms, what you tried, or the section of the manual you are using.

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