SOHO Instruments SCB-68A

SOHO Instruments NI SCB-68A Shielded Connector Block User Manual

Model: SCB-68A

1. Introduction

The SOHO Instruments NI SCB-68A is a high-performance shielded connector block designed for reliable and low-noise signal termination with 68-pin plug-in data acquisition devices. This unit provides a robust interface for precision measurement systems, ensuring signal integrity in demanding environments. It features a magnetic removable lid for easy access, a resettable fuse for overcurrent protection, and compatibility with DIN-rail mounting for versatile installation.

The SCB-68A supports both single- and dual-connector multifunction I/O devices that utilize 68-pin connections. It integrates an onboard cold-junction compensation sensor, essential for accurate thermocouple measurements, and includes two general-purpose breadboard areas to facilitate prototyping and custom circuit development.

Key Features:

- 68-pin shielded I/O terminal block for low-noise signal termination.
- Magnetic removable lid for convenient access.
- DIN-rail mount compatibility for flexible installation.
- Resettable fuse for overcurrent protection.
- Compatible with single- and dual-connector 68-pin multifunction I/O devices.
- Onboard cold-junction compensation sensor for thermocouple measurements.
- Two general-purpose breadboard areas for prototyping.
- Robust design for secure, shielded connections in high-precision applications.

What's in the Box:

- 1 x SOHO Instruments NI SCB-68A Shielded Connector Block

Figure 1: The SCB-68A unit as received in its anti-static packaging.

2. Safety Information

Before installing or operating the SCB-68A, please read and understand the following safety precautions. Failure to comply with these instructions may result in personal injury or damage to the equipment.

- **Qualified Personnel:** Installation and servicing should only be performed by qualified personnel.
- **Power Disconnection:** Ensure all power to connected data acquisition devices and systems is disconnected before making or breaking any connections to the SCB-68A.
- **Proper Grounding:** Always ensure proper grounding of the SCB-68A and connected equipment to prevent electrical shock and ensure signal integrity.
- **Environmental Conditions:** Operate the device within specified environmental conditions (temperature, humidity) to prevent damage.
- **Fuse Protection:** The SCB-68A includes a resettable fuse. Do not bypass or replace it with a fuse of a different rating. If the fuse trips repeatedly, investigate the cause of the overcurrent.
- **Shielding Integrity:** Maintain the integrity of the shielded enclosure to ensure low-noise performance.

3. Setup and Installation

This section details the steps for physically installing and connecting the SCB-68A to your data acquisition system.

3.1. Mounting the SCB-68A

The SCB-68A is designed for versatile mounting options, including DIN-rail compatibility. Ensure the mounting location is stable, free from excessive vibration, and allows for adequate ventilation.

- **DIN-Rail Mounting:** Attach the SCB-68A to a standard DIN rail by engaging the clips on the back of the unit with the rail and pressing firmly until it clicks into place.
- **Surface Mounting:** The unit can also be surface-mounted using appropriate screws through the designated mounting holes (if present, refer to physical unit for exact locations).

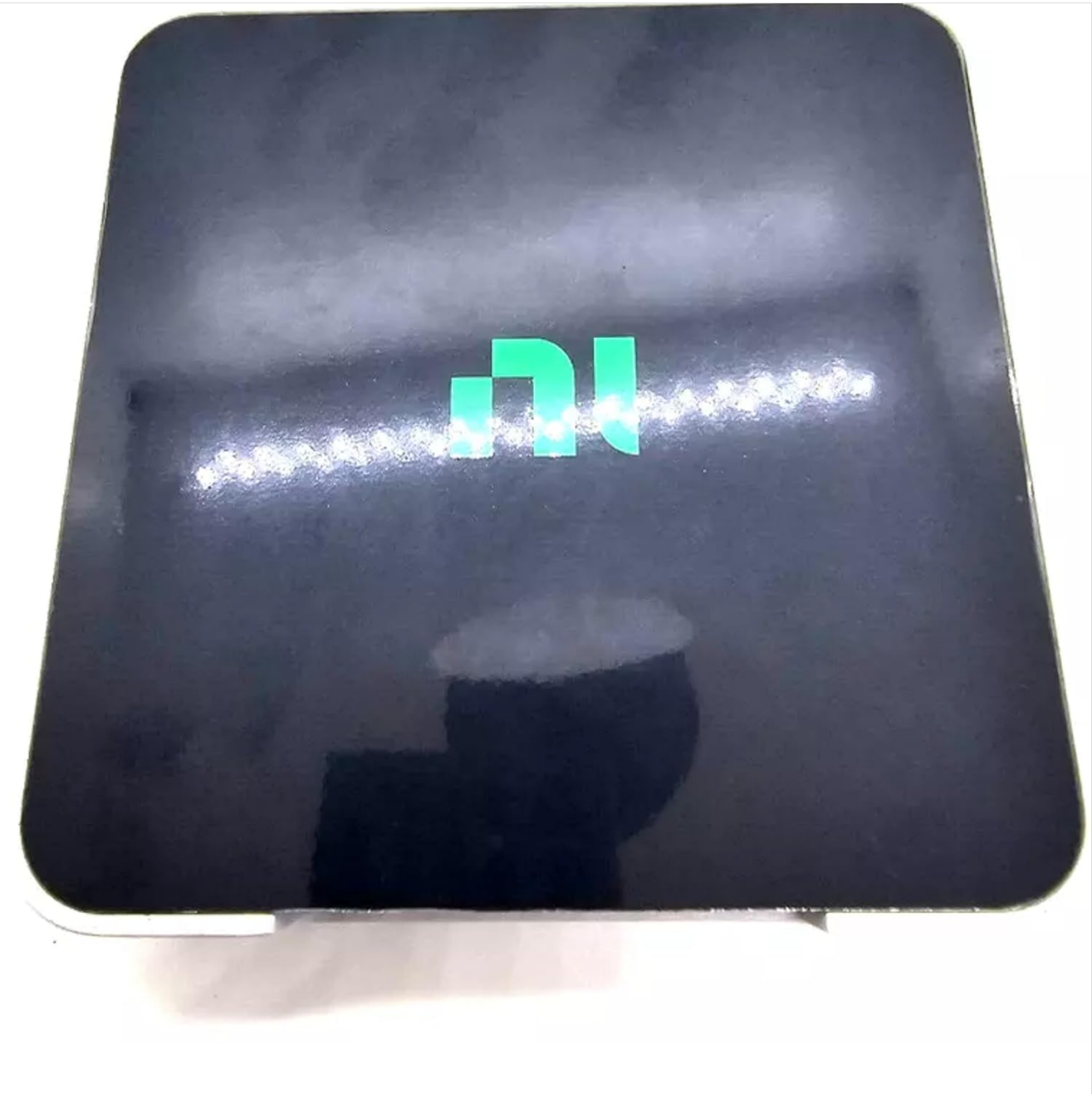

Figure 2: The SCB-68A unit, illustrating its form factor and potential mounting points.

3.2. Connecting to Data Acquisition Devices

The SCB-68A connects to 68-pin data acquisition (DAQ) devices using a compatible shielded cable (not included). Ensure the cable is securely fastened at both ends.

1. Connect one end of the 68-pin shielded cable to your DAQ device.
2. Connect the other end of the 68-pin shielded cable to the corresponding connector on the SCB-68A.
3. Ensure all connections are firm to maintain signal integrity and shielding effectiveness.

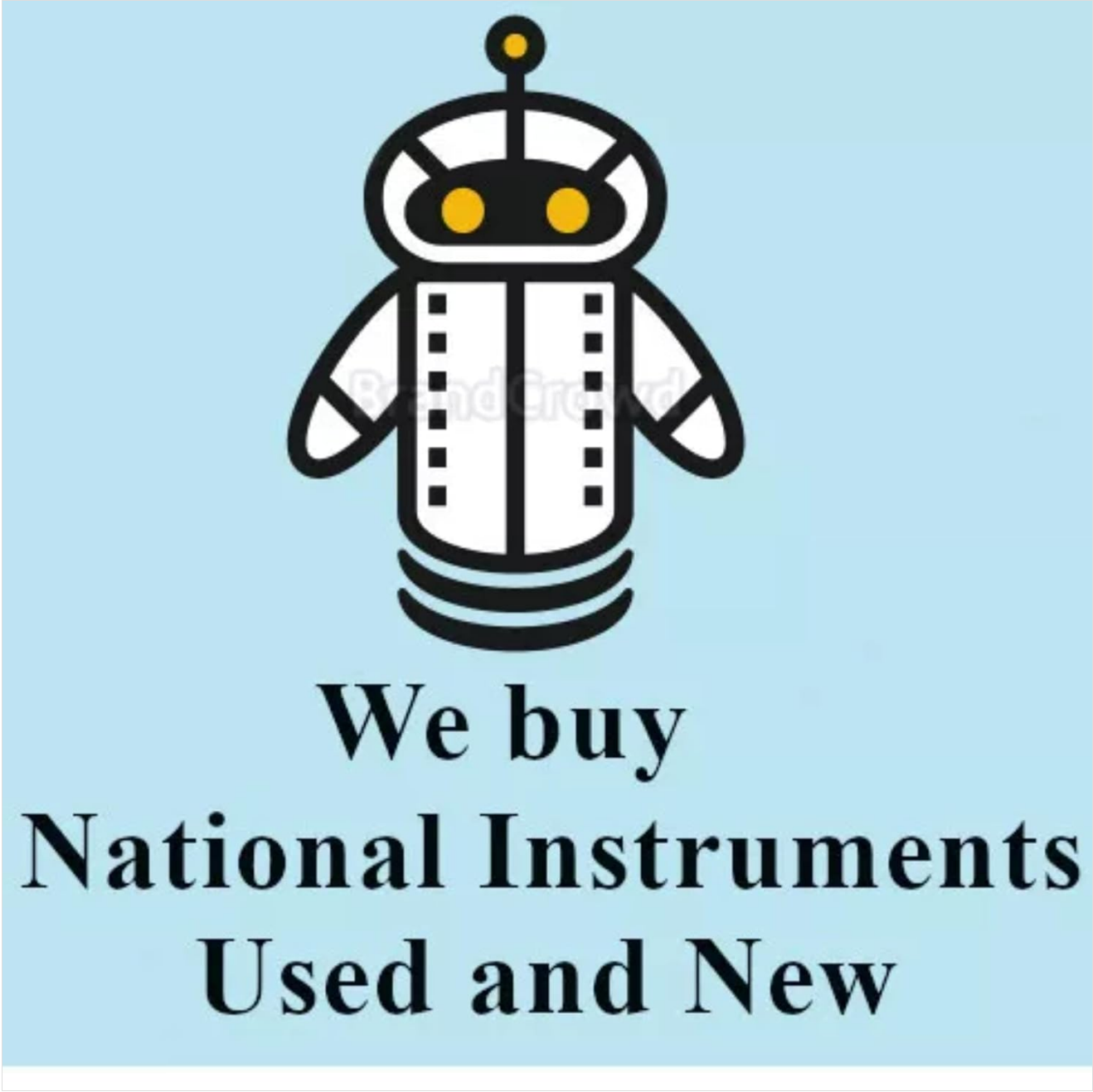

Figure 3: Side view of the SCB-68A, highlighting the 68-pin connector port for DAQ device connection.

3.3. Wiring Screw Terminals

The SCB-68A provides screw terminals for connecting external signals. The magnetic removable lid allows easy access to these terminals.

1. Gently remove the magnetic lid to expose the screw terminals.
2. Refer to your DAQ device's pinout documentation to identify the correct terminals for your signals.
3. Strip approximately 5-7 mm of insulation from your signal wires.
4. Insert the stripped wire into the appropriate screw terminal and tighten the screw firmly to ensure a secure electrical connection. Do not overtighten.
5. After wiring, replace the magnetic lid to maintain shielding and protect connections.

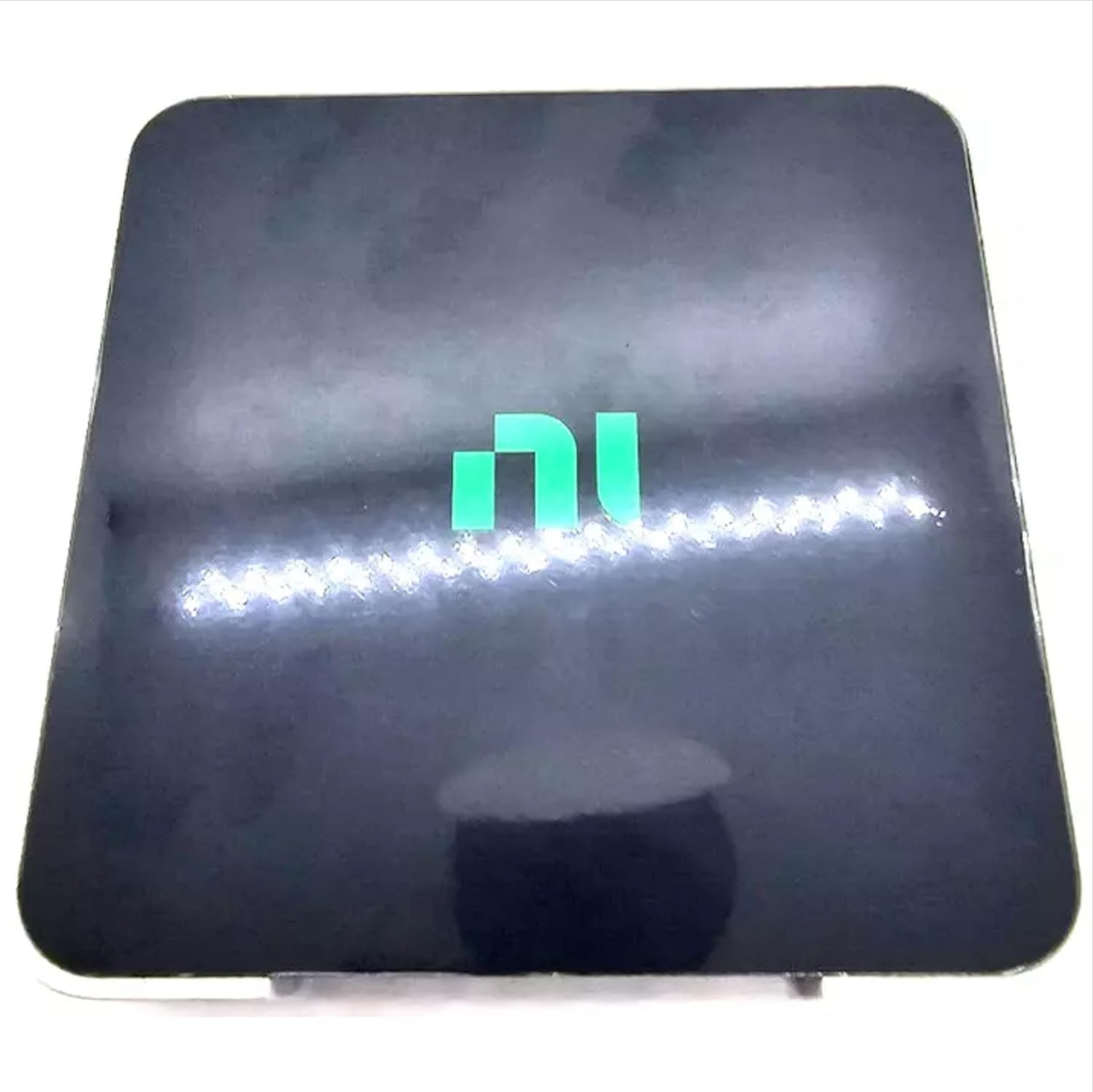

Figure 4: Top view of the SCB-68A with the magnetic lid removed, showing the array of screw terminals for signal wiring.

4. Operation

Once installed and wired, the SCB-68A acts as a passive interface between your external signals and the 68-pin DAQ device. Its primary function is to provide a robust, shielded connection point for various measurement and control applications.

4.1. General Signal Termination

The shielded design of the SCB-68A minimizes noise pickup, making it suitable for sensitive analog and digital signals. Ensure all signal grounds are properly connected to the designated ground terminals on the SCB-68A to maximize shielding effectiveness.

4.2. Cold-Junction Compensation (CJC)

For thermocouple measurements, the SCB-68A includes an onboard cold-junction compensation sensor. This sensor provides a reference temperature for accurate thermocouple readings. When using thermocouples, connect them directly to the appropriate screw terminals as indicated by your DAQ device's documentation. The DAQ

software will typically read the CJC sensor data automatically to correct thermocouple measurements.

4.3. Prototyping Areas

The two general-purpose breadboard areas on the SCB-68A provide space for custom circuitry, signal conditioning, or additional components. These areas are unpopulated, allowing users to solder components as needed for specific application requirements. Ensure that any custom circuitry does not interfere with the primary signal paths or compromise the shielding of the main connector block.

5. Maintenance

The SCB-68A is designed for long-term, reliable operation with minimal maintenance. Regular inspection and proper handling will ensure its continued performance.

- **Cleaning:** Keep the unit clean and free from dust and debris. Use a soft, dry cloth for cleaning. Avoid using solvents or abrasive cleaners.
- **Connection Integrity:** Periodically check all screw terminal connections and the 68-pin cable connection to ensure they remain tight and secure.
- **Fuse Check:** The resettable fuse will automatically reset after an overcurrent condition is removed. If the fuse trips frequently, investigate the cause of the overcurrent in your external circuitry. Do not attempt to replace or bypass the resettable fuse.
- **Environmental Control:** Ensure the operating environment remains within specified temperature and humidity ranges to prevent component degradation.

6. Troubleshooting

This section provides guidance for common issues encountered with the SCB-68A.

Problem	Possible Cause	Solution
No signal or intermittent signal.	Loose screw terminal connection. Faulty 68-pin cable. Incorrect wiring. Issue with DAQ device or external sensor.	Check and tighten all screw terminal connections. Inspect the 68-pin cable for damage; try a different cable if available. Verify wiring against DAQ device pinout. Test DAQ device and external sensors independently.
High noise in signals.	Improper grounding. Damaged shielding on cable or unit. External electromagnetic interference (EMI).	Ensure proper grounding of the SCB-68A and connected equipment. Inspect the 68-pin cable and SCB-68A for physical damage to shielding. Relocate the setup away from strong EMI sources; use additional shielding if necessary.
Resettable fuse trips repeatedly.	Overcurrent condition in connected circuitry.	Identify and resolve the source of the overcurrent in your external wiring or connected devices. Reduce load or correct short circuits.

7. Specifications

Parameter	Value

Parameter	Value
Model	SCB-68A
Connector Type	68-pin shielded I/O
Terminal Type	Screw terminals
Shielding	Yes, robust shielded enclosure
Overcurrent Protection	Resettable fuse
Mounting Options	DIN-rail compatible, surface mount
Special Features	Magnetic removable lid, onboard cold-junction compensation sensor, two general-purpose breadboard areas
Manufacturer	National Instruments (as per product data)
ASIN	B0DPL6RHXC

8. Warranty and Support

For warranty information and technical support, please refer to the documentation provided with your purchase or contact SOHO Instruments directly through their official website or customer service channels. Ensure you have your product model (SCB-68A) and purchase details available when seeking support.

SOHO Instruments Contact Information:
Please visit the SOHO Instruments Store on Amazon for further information or to contact support.