COMPREHENSIVE SERVICES

We offer competitive repair and calibration services, as well as easily accessible documentation and free downloadable resources.

SELL YOUR SURPLUS

We buy new, used, decommissioned, and surplus parts from every NI series. We work out the best solution to suit your individual needs.

Sell For Cash Get Credit Receive a Trade-In Deal

OBSOLETE NI HARDWARE IN STOCK & READY TO SHIP

We stock **New, New Surplus, Refurbished,** and **Reconditioned** NI Hardware.

APEX WAVES

Bridging the gap *between the manufacturer and your legacy test system.*

1-800-915-6216

www.apexwaves.com

sales@apexwaves.com

Request a Quote CLICK HERE *TB-4300B*

CALIBRATION PROCEDURE

NI TB-4300B

Français Deutsch 日本語 한국어 简体中文

ni.com/manuals

This document contains information about verifying National Instruments TB-4300B terminal blocks. For more information about calibration, visit ni.com/calibration.

Contents

Software Requirements

No other software is required to verify the operation of the TB-4300B. All of the information necessary to verify this terminal block is located in this calibration procedure.

Documentation Requirements

You may find the following document useful for reference. You can download the latest version of this document from the NI Web site at ni.com/manuals.

- The *NI SC Express 4300 Installation Guide and Terminal Block Specifications* provides instructions for installing and configuring the NI PXIe-4300 module and TB-4300/4300B and includes terminal block specifications.

Calibration Interval

National Instruments recommends a calibration interval of five years for the TB-4300B. Verify at the recommended interval based on the measurement accuracy demands of your application.

NATIONAL INSTRUMENTS

Test Equipment

National Instruments recommends that you use the instruments in Table 1 for adjusting and verifying a TB-4300B.

Table 1. Recommended Equipment

Equipment	Recommended Model	Requirements
Calibrator	Fluke 5700A	If this instrument is unavailable, use a high-precision voltage source with an accuracy of at least 10 ppm for adjustment and at least 40 ppm for verification. The source needs an output impedance of less than or equal to 50 Ω.
DMM	NI 4070	If this instrument is unavailable, use a multiranging 6½ digit DMM with an accuracy of at least 40 ppm and an input impedance of >10 GΩ.
Connection Accessory	CAL-4300B	Fixture required for verification of the TB-4300B.

Test Conditions

The following setup and environmental conditions are required to ensure the terminal block meets published specifications.

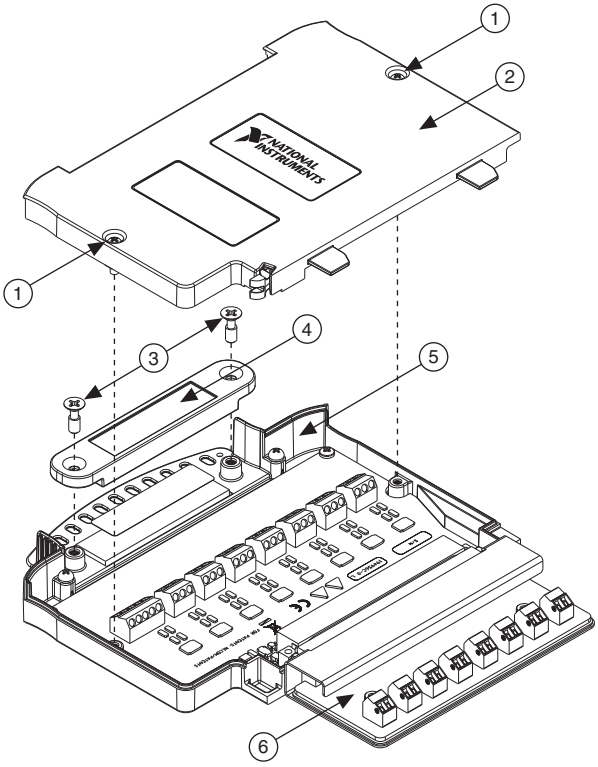
- Keep connections to the device as short as possible. Long cables and wires can act as antennae, which can pick up extra noise that affects measurements.
- Verify that all connections to the device are secure.
- Maintain the ambient temperature between 20 °C and 30 °C.
- Keep relative humidity below 80%.
- Allow at least 15 minutes warm-up time to ensure that the measurement circuitry is at a stable operating temperature.
- Use shielded copper wire for all cable connections to the device. Use twisted-pair wire to eliminate noise and thermal offsets.

Verification Procedure

Complete the following steps to verify the attenuation ratio of the TB-4300B:

1. Loosen the top cover captive screws and remove the top cover while referring to Figure 1.
2. Remove the strain relief screws and the strain relief.

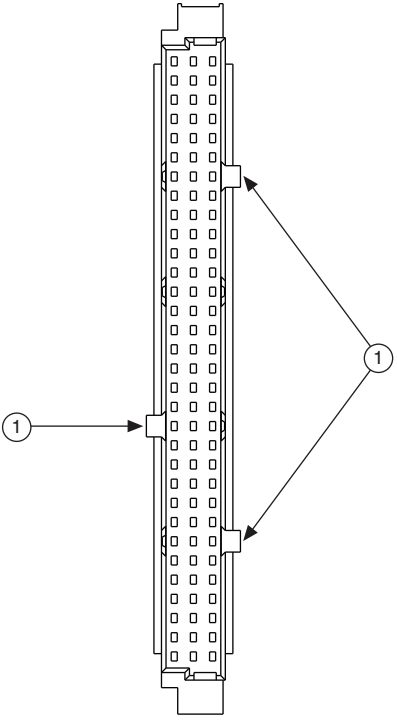
Figure 1. TB-4300B/CAL-4300B Assembly



1	Top Cover Captive Screws	4	Strain Relief
2	Top Cover	5	TB-4300B
3	Strain Relief Screws	6	CAL-4300B

Caution Make sure the TB-4300B has three keys installed in its connector and that none of the keys are loose. The keying locations are shown in Figure 2. If any of the three keys are missing or loose, refer to the *Where to Go for Support* section for assistance in returning the terminal block to NI.

Figure 2. TB-4300B Connector Key Locations

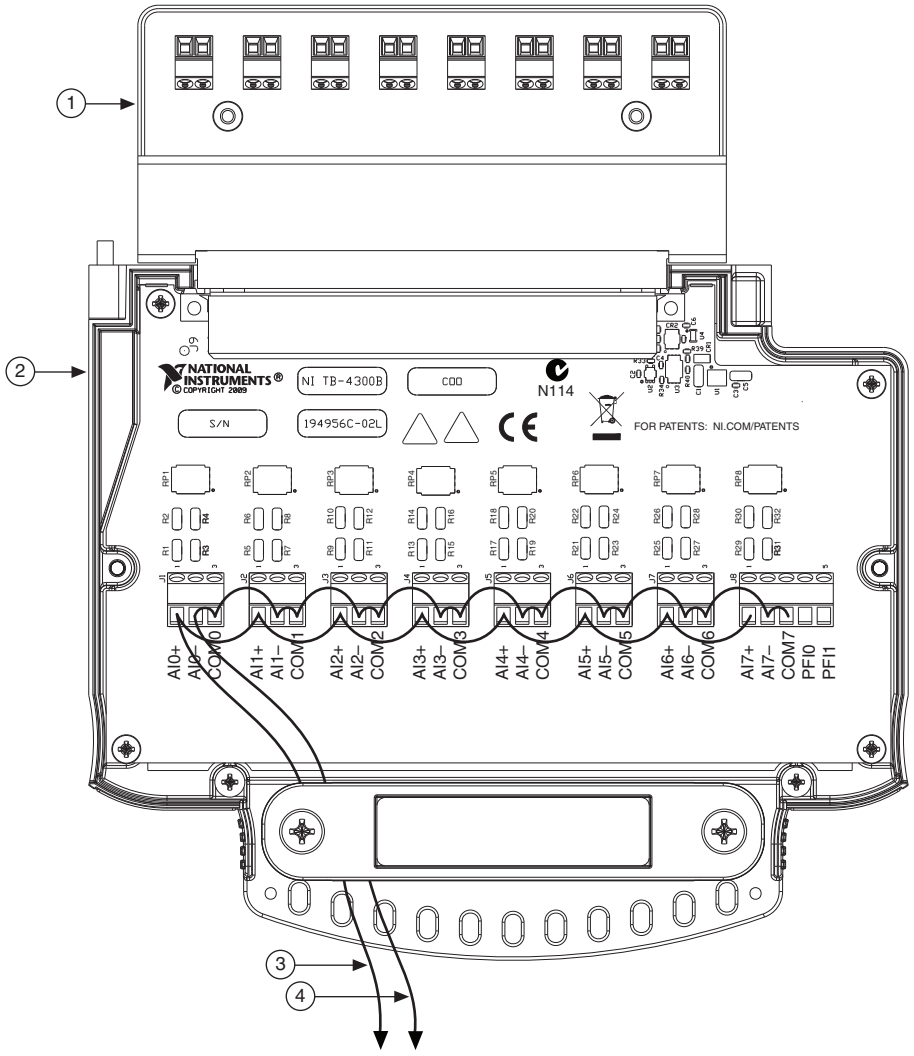


1 Key Locations

3. Connect the TB-4300B to the CAL-4300B by aligning the connectors and pressing them together until they are seated.

4. Connect the calibrator to the TB-4300B as shown in Figure 3.
5. Replace and secure the strain relief and top cover.

Figure 3. TB-4300B Verification Input Measurement Wiring Diagram

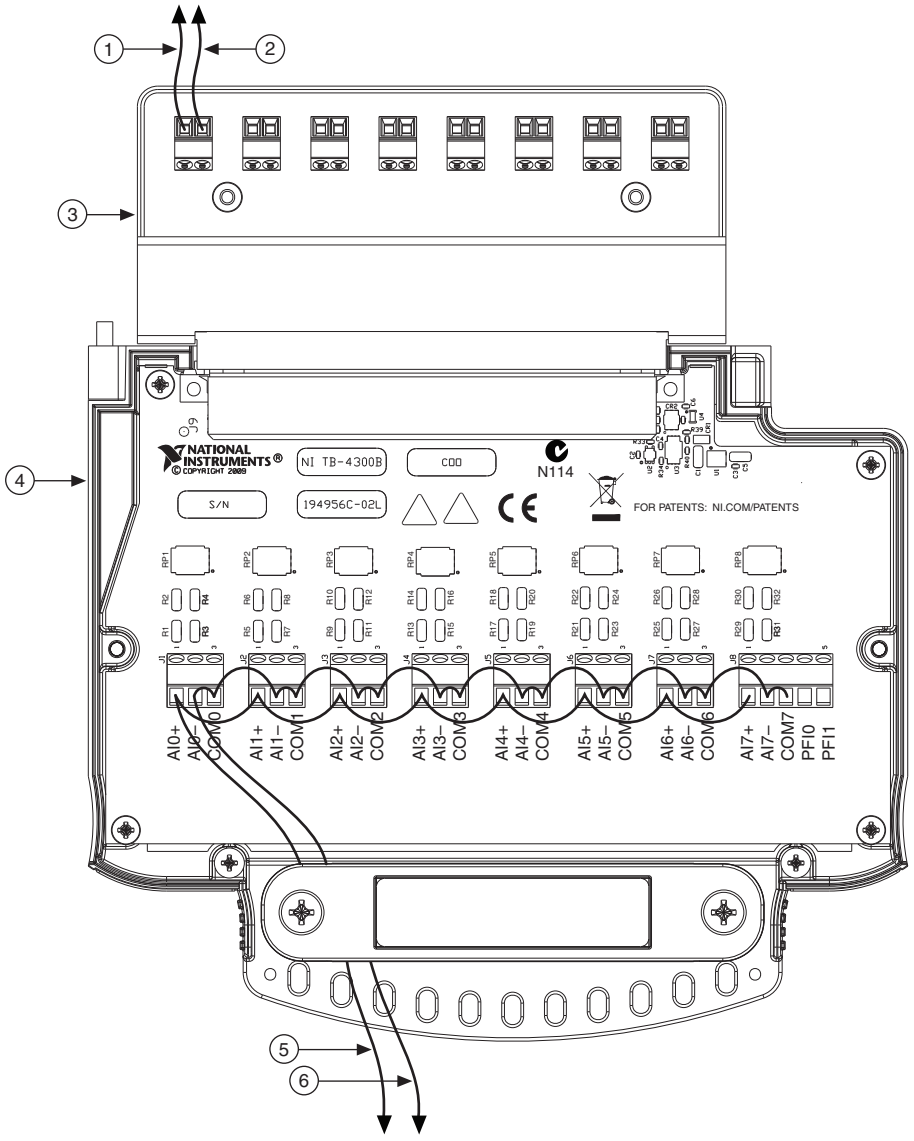


1	CAL-4300B	3	To Calibrator +
2	TB-4300B	4	To Calibrator –

6. Set the calibrator to 60 V. Refer to Table 2 for Lower and Upper Limits.
7. After enabling the calibrator, allow the TB-4300B to warm up for a minimum of 15 minutes.

8. Connect the DMM to the output of AI0 on the CAL-4300B as shown in Figure 4. The output voltage will be 1/30 of the input voltage; therefore, you must change the DMM range accordingly.

Figure 4. TB-4300B Verification Output Measurement Wiring Diagram



1	To DMM –	3	CAL-4300B	5	To Calibrator +
2	To DMM +	4	TB-4300B	6	To Calibrator –

Note If using an NI DMM or a DMM with a selectable impedance, set the input impedance to >10 GΩ.

9. Measure the voltage output on the CAL-4300B using the DMM. Use Table 2 to verify that the channel is within the limits.

Table 2. TB-4300B Test Limits

Voltage	Lower Limit (V)	Upper Limit (V)
60	1.998646	2.000689
Note: These limits assume the ambient temperature is between 20 °C and 30 °C and that the input voltages are exactly as stated. If this is not the case, refer to the following text to calculate the limits. The values were derived from information available in the *NI PXIe-4300 and TB-4300B Installation Guide and Terminal Block Specifications* document.		

If the temperature is outside those found in Table 2, you can calculate the lower and upper limits as follows:

$$LowerLimit = \frac{V_{in}}{30.019601 + 0.000146\Delta t}$$

$$UpperLimit = \frac{V_{in}}{29.990401 - 0.000146\Delta t}$$

where V_{in} is the input voltage of 60 V.

Δt is the absolute temperature difference between the ambient temperature and 25 °C.

10. Disconnect the DMM and connect it to the next channel.
11. Repeat steps 9 through 10 for all channels.

If the verification procedure determines that the TB-4300B is outside of the specifications, refer to *Where to Go for Support* for assistance in returning the terminal block to NI.

Where to Go for Support

The National Instruments Web site is your complete resource for technical support. At ni.com/support you have access to everything from troubleshooting and application development self-help resources to email and phone assistance from NI Application Engineers.

National Instruments corporate headquarters is located at 11500 North Mopac Expressway, Austin, Texas, 78759-3504. National Instruments also has offices located around the world to help address your support needs. For telephone support in the United States, create your service request at ni.com/support and follow the calling instructions or dial 512 795 8248. For telephone support outside the United States, visit the Worldwide Offices section of ni.com/niglobal to access the branch office Web sites, which provide up-to-date contact information, support phone numbers, email addresses, and current events.

373549B-01 Aug12