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TB-4163 Features

2023-12-05

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TB-4163 User Guide

This document explains how to install and use the TB-4163 terminal block with a PXIe-4163 source measure unit (SMU) and includes TB-4163 specifications.

The TB-4163 terminal block is used for screw terminal connections with the PXIe-4163 SMU.

Read this document before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards. Visit ni.com/manuals for more information about your product, including specifications, pinouts, and instructions for connecting, installing, and configuring your system.

Caution Observe all instructions and cautions in the user documentation. Using the product in a manner not specified can damage the product and compromise the built-in safety protection.

Attention Suivez toutes les instructions et respectez toutes les mises en garde de la documentation d'utilisation. L'utilisation du produit de toute autre façon que celle spécifiée risque de l'endommager et de compromettre la protection de sécurité intégrée.

Notice This device is intended for use only with the PXIe-4163 SMU. For more information about the PXIe-4163, refer to ni.com/manuals.

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Icons

ⓘ	**Notice** Take precautions to avoid data loss, loss of signal integrity, degradation of performance, or damage to the model.
⚠	**Caution** Take precautions to avoid injury. Consult the model documentation for cautionary statements when you see this icon printed on the model. Cautionary statements are localized into French for compliance with Canadian requirements.

Kit Contents and Other Equipment

Your kit includes an assembled TB-4163. In addition, you will need the following items not included in your TB-4163 kit to install and use the TB-4163.

- PXIe-4163 [1]
- 28 to 24 AWG signal wires
- 20 AWG ground wire
- Number 1 Phillips-head screwdriver
- Flathead screwdriver
- Wire insulation strippers
- Wire cutters

Visit ni.com for more information about the PXIe-4163.

Installing the TB-4163

Complete the following steps to install the TB-4163 with a PXIe-4163 and prepare signal connections.

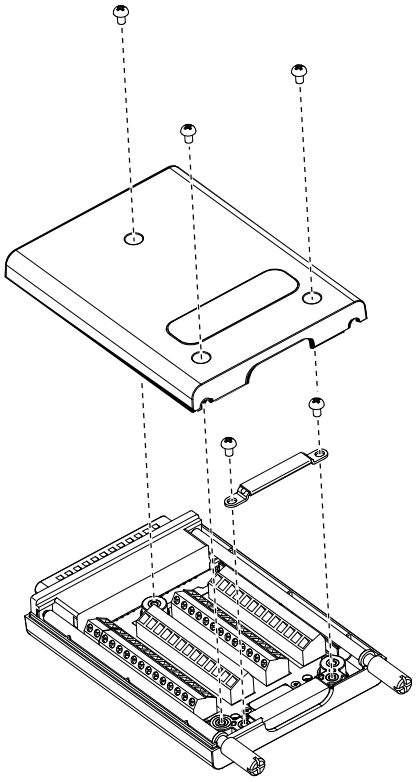
Before you begin, install the PXIe-4163 in a chassis and ensure that all signals are disconnected from the PXIe-4163 if you have not already done so. Refer to the PXIe-4163 Getting Started Guide for installation instructions.

1. Prepare the wires by stripping the insulation 0.5 mm to 0.6 mm (0.020 in. to 0.025 in.) from one end of all wires.

Use a ground wire with a minimum wire gauge of 20 AWG for connecting to Output LO. For all other connections, use signal wires with a wire gauge of 28 to 24 AWG.

2. Disassemble the TB-4163.
    a. Unscrew the three screws on the top of the TB-4163 to remove the top cover.
    b. Unscrew the two screws securing the strain relief to remove the strain relief.

Figure 1. Disassembled TB-4163



3. Connect the signal wires and ground wire.
    a. Insert the stripped end of the ground wire into the LO screw terminal and tighten the screw of the screw terminal to a torque of 0.5 Nm (4 lb · in.).
    b. Insert the stripped end of the signal wires into the appropriate terminals and tighten the screws of the screw terminals to a torque of 0.5 Nm (4 lb · in.).

Refer to the following pinout, signal information, and PXIe-4163 pin map to make the appropriate connections for your application.

Figure 1. TB-4163 Pinout

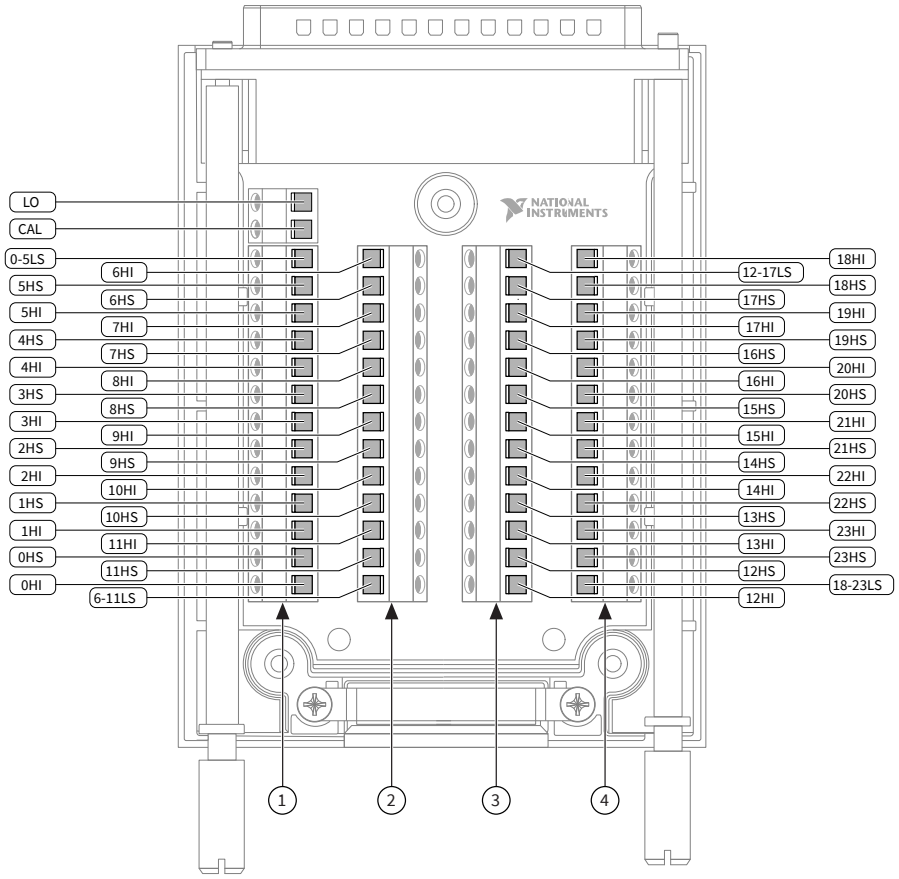


Table 1. TB-4163 Signals and PXIe-4163 Pin Map

Screw Terminal	Signal	PXIe-4163 Pin
Connector 1		
LO	CH 0-23 Output LO	10
CAL	Calibration HI	21
0-5LS	CH 0-5 Sense LO	40
5HS	CH 5 Sense HI	59
5HI	CH 5 Output HI	60
4HS	CH 4 Sense HI	38
4HI	CH 4 Output HI	39
3HS	CH 3 Sense HI	17

Screw Terminal	Signal	PXIe-4163 Pin
3HI	CH 3 Output HI	18
2HS	CH 2 Sense HI	19
2HI	CH 2 Output HI	20
1HS	CH 1 Sense HI	41
1HI	CH 1 Output HI	42
0HS	CH 0 Sense HI	61
0HI	CH 0 Output HI	62
Connector 2		
6HI	CH 6 Output HI	57
6HS	CH 6 Sense HI	56
7HI	CH 7 Output HI	37
7HS	CH 7 Sense HI	36
8HI	CH 8 Output HI	15
8HS	CH 8 Sense HI	14
9HI	CH 9 Output HI	13
9HS	CH 9 Sense HI	12
10HI	CH 10 Output HI	34
10HS	CH 10 Sense HI	33
11HI	CH 11 Output HI	55
11HS	CH 11 Sense HI	54
6-11LS	CH 6-11 Sense Lo	35
Connector 3		
12-17LS	CH 12-17 Sense LO	29
17HS	CH 17 Sense HI	48
17HI	CH 17 Output HI	49
16HS	CH 16 Sense HI	27
16HI	CH 16 Output HI	28
15HS	CH 15 Sense HI	6
15HI	CH 15 Output HI	7
14HS	CH 14 Sense HI	8
14HI	CH 14 Output HI	9

Screw Terminal	Signal	PXIe-4163 Pin
13HS	CH 13 Sense HI	30
13HI	CH 13 Output HI	31
12HS	CH 12 Sense HI	50
12HI	CH 12 Output HI	51
Connector 4		
18HI	CH 18 Output HI	46
18HS	CH 18 Sense HI	45
19HI	CH 19 Output HI	26
19HS	CH 19 Sense HI	25
20HI	CH 20 Output HI	4
20HS	CH 20 Sense HI	3
21HI	CH 21 Output HI	2
21HS	CH 21 Sense HI	1
22HI	CH 22 Output HI	23
22HS	CH 22 Sense HI	22
23HI	CH 23 Output HI	44
23HS	CH 23 Sense HI	43
18-23LS	CH 18-23 Sense LO	24

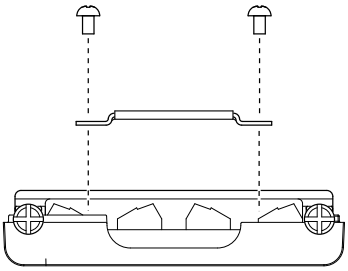
c. Ensure that none of the stripped wire is outside of the screw terminal.

4. Reassemble the TB-4163.

a. Bundle the wires together under the strain relief and install the strain relief by tightening the two screws removed in previous steps to a torque of 0.3 Nm (2.7 lb · in.).

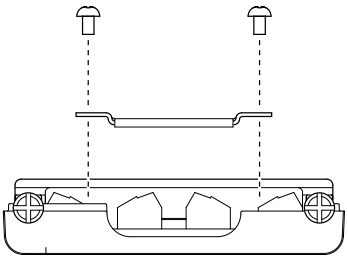
- If you are connecting several wires, assemble the strain relief upward.

Figure 1. TB-4163 Strain Relief Up



- If you are connecting only a few wires, assemble the strain relief downward for greater retention.

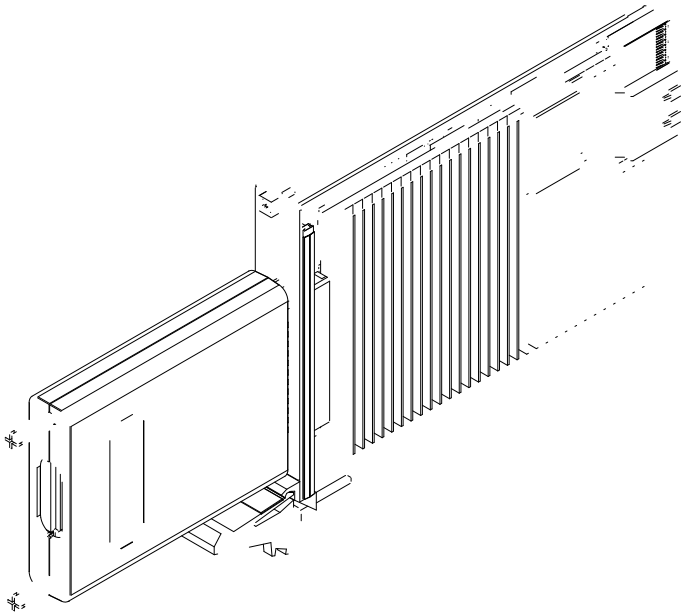
Figure 1. TB-4163 Strain Relief Down



b. Install the top cover of the TB-4163 by tightening the three screws removed in previous steps to a torque of 0.3 Nm (2.7 lb · in.).

5. Connect the TB-4163 to the PXIe-4163.
   a. Align the male D-SUB connector on the back of the TB-4163 and the female D-SUB connector on the front of the PXIe-4163 and attach.
   b. Tighten the thumbscrews on the front of the TB-4163 until the terminal block is secured to the PXIe-4163.

Figure 1. Installed TB-4163



Uninstalling the TB-4163

1. Disconnect all signals to the PXIe-4163.
2. Loosen the thumbscrews on the front of the TB-4163 and detach the terminal block from the front of the PXIe-4163.

TB-4163 Specifications

These specifications apply to the TB-4163 terminal block for use with the PXIe-4163. The PXIe-4163 is a 24-Channel, ±24 V, 50 mA source measure unit (SMU). Refer to the PXIe-4163 Specifications for more information.

Definitions

Warranted specifications describe the performance of a model under stated operating conditions and are covered by the model warranty.

Characteristics describe values that are relevant to the use of the model under stated operating conditions but are not covered by the model warranty.

- **Typical** specifications describe the performance met by a majority of models.
- **Nominal** specifications describe an attribute that is based on design, conformance testing, or supplemental testing.

Specifications are **Nominal** unless otherwise noted.

Screw Terminal Wiring

Wire gauge	
Signal wire	28 to 24 AWG
Ground wire	20 AWG
Length of bare wire (insulation stripped) from one end of the wire	0.5 mm to 0.6 mm (0.020 in. to 0.025 in.)
Screw terminal torque	0.5 Nm (4 lb · in.)
Spacing between screw terminals	3.5 mm (0.14 in.)

Physical

Top cover and strain relief screws	M 2.5
Top cover and strain relief screw torque	0.3 Nm (2.7 lb · in.)
Dimensions	122 mm × 74 mm × 18 mm (4.8 in. × 2.9 in. × 0.7 in.)
Weight	138 g (4.87 oz)

Environmental Guidelines

Notice This model is intended for use in indoor applications only.

Environmental Characteristics

Temperature	
Operating	
Chassis with slot cooling capacity ≥58 W[1]	0 °C to 55 °C
All other compatible chassis	0 °C to 40 °C
Storage	-40 °C to 71 °C
Humidity	

Operating	10% to 90%, noncondensing
Storage	5% to 95%, noncondensing
Pollution Degree	2
Maximum altitude	2,000 m (800 mbar) (at 25 °C ambient temperature)

Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the **Engineering a Healthy Planet** web page at ni.com/environment. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

EU and UK Customers

- **Waste Electrical and Electronic Equipment (WEEE)**—At the end of the product life cycle, all NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit ni.com/environment/weee.

电子信息产品污染控制管理办法（中国 RoHS）

- **中国 RoHS**— NI 符合中国电子信息产品中限制使用某些有害物质指令 (RoHS)。关于 NI 中国 RoHS 合规性信息，请登录 ni.com/environment/rohs_china。(For information about China RoHS compliance, go to ni.com/environment/rohs_china.)

CE Compliance CE

This product meets the essential requirements of applicable European Directives, as follows:

- 2011/65/EU; Restriction of Hazardous Substances (RoHS)

Export Compliance

This product is subject to control under the U.S. Export Administration Regulations (15 CFR Part 730 et. seq.) administered by the U.S. Department of Commerce's Bureau of Industry and Security (BIS) (www.bis.doc.gov) and other applicable U.S. export control laws and sanctions regulations. This product may also be subject to additional license requirements of other countries' regulations.
Additionally, this product may also require export licensing before being returned to NI. The issuance of a Return Material Authorization (RMA) by NI does not constitute export authorization. The user must comply with all applicable export laws prior to exporting or re-exporting this product. See ni.com/legal/export-compliance for more information and to request relevant import classification codes (e.g. HTS), export classification codes (e.g. ECCN), and other import/export data.

Product Certifications and Declarations

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for NI products, visit ni.com/product-certifications, search by model number, and click the appropriate link.

Additional Resources

Visit ni.com/manuals for information about the PXIe-4163 and the following resources:

- **PXIe-4163 Getting Started Guide**
- **PXIe-4163 Specifications**
- **NI DC Power Supplies and SMUs Help**
- **PXIe-4162/4163 Calibration Procedure**
- **PXIe-4163 Safety, Environmental, and Regulatory Information**

NI Services

Visit ni.com/support to find support resources including documentation, downloads, and troubleshooting and application development self-help such as tutorials and examples.

Visit ni.com/services to learn about NI service offerings such as calibration options, repair, and replacement.

Visit ni.com/register to register your NI product. Product registration facilitates technical support and ensures that you receive important information updates from NI.

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