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GETTING STARTED GUIDE AND TERMINAL BLOCK SPECIFICATIONS

PXIe-4310 and TB-4310 (10V)/TB-4310 (600V)

8-channel, 16-bit, 400 kS/s/ch, Ch-Ch Isolated Analog Input Module

Français Deutsch 日本語 한국어 简体中文

ni.com/manuals

This document explains how to install, configure, and set up the PXIe-4310 module with the TB-4310 (10V)/TB-4310 (600V) terminal block. Driver support for the PXIe-4310 was first available in NI-DAQmx 17.1. For the list of devices supported by a specific release, refer to the *NI-DAQmx Readme*, available on the version-specific download page or installation media.



Note The keying of this terminal block prevents it from connecting to other modules that could be damaged by the voltage present on the terminal block. However, you should only use these terminal blocks with their supported modules.



Caution Do not supply hazardous voltages (>30 V_{rms}/42.4 V_{pk}/60 VDC) to the terminal block without the terminal block being connected to the PXIe-4310.



Caution This icon denotes a caution, which advises you of precautions to take to avoid injury, data loss, or a system crash.

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Electromagnetic Compatibility Guidelines

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) stated in the product specifications. These requirements and limits provide reasonable protection against harmful interference when the product is operated in the intended operational electromagnetic environment.

This product is intended for use in industrial locations. However, harmful interference may occur in some installations, when the product is connected to a peripheral device or test object, or if the product is used in residential or commercial areas. To minimize interference with radio and television reception and prevent unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Furthermore, any modifications to the product not expressly approved by National Instruments could void your authority to operate it under your local regulatory rules.

Caution To ensure the specified EMC performance, operate this product only with shielded cables and shielded accessories. Use only twisted, shielded pair cables (Belden 83319 or equivalent) for channel connections. Refer to the *PXIe-4310 User Manual* for specific guidance on terminating cable shields.

Safety Guidelines for Hazardous Voltages

If hazardous voltages are connected to the module, take the following precautions. A hazardous voltage is a voltage greater than 42.4 V_{pk} or 60 VDC to earth ground.

Caution Ensure that hazardous voltage wiring is performed only by qualified personnel adhering to local electrical standards.

Caution You must install mating connectors according to local safety codes and standards and according to the specifications provided by the manufacturer. You are responsible for verifying the safety compliance of third-party connectors and their usage according to the relevant standard(s), including UL and CSA in North America and IEC and VDE in Europe.

Caution Make sure that devices and circuits connected to the module are properly insulated from human contact.

Caution When module terminals are hazardous voltage LIVE (>42.4 V_{pk} /60 VDC), you must ensure that devices and circuits connected to the module are properly insulated from human contact.

Caution Do not mix hazardous voltage circuits and human-accessible circuits on the same module.

What You Need to Get Started

To set up and use a PXIe-4310 module with a TB-4310 (10V)/TB-4310 (600V) terminal block, you need the following items:

☐ Hardware
- PXIe-4310 module
- TB-4310 (10V)/TB-4310 (600V) terminal block
- PXI Express chassis
- Cabling and sensors as required for your application

☐ Tools
- Number 1 and 2 Phillips-head screwdrivers
- 1/8 in. flathead screwdriver
- Long-nose pliers

- Wire cutter
- Wire insulation stripper

☐ Documentation
- *PXIe-4310 and TB-4310 (10V)/TB-4310 (600V) Getting Started Guide and Terminal Block Specifications*
- *PXIe-4310 User Manual*
- *PXIe-4310 Specifications*
- PXI Express chassis user manual

You can download needed documents from ni.com/manuals.

Installation

Install the Software

Note You must be an administrator to install NI software and devices on your computer.

Ensure that the following software is installed before installing the PXIe-4310 and TB-4310 (10V)/TB-4310 (600V) hardware:

1. Your application software, such as LabVIEW, LabWindows™/CVI™, or .NET.
2. NI-DAQmx—PXIe-4310 modules were first supported in NI-DAQmx 17.1.

Note For detailed NI software version support, refer to the *NI-DAQmx Readme*. Back up any applications before upgrading software or modifying the application.

Unpack and Install the Module

Remove the packaging and inspect the module. Contact NI if the module is damaged. Do not install a damaged module.

Caution The module is static sensitive. Always properly ground yourself and the equipment when handling or connecting to the module.

Complete the following steps to install the PXIe-4310 module while referring to Figures 1 and 2:

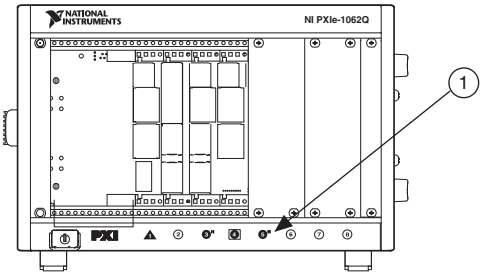
Note To maintain forced air cooling in the PXI Express system, refer to the *Maintain Forced-Air Cooling Note to Users*.

1. Plug in your chassis before installing the PXIe-4310. The power cord grounds the chassis and protects it from electrical damage while you install the module.
2. Make sure the chassis is powered off.

Caution To protect yourself, the chassis, and the PXIe-4310 from electrical hazards, leave the chassis powered off until you finish installing the PXIe-4310 module.

3. Touch a metal part on the chassis to discharge any accumulated static electricity.
4. Identify a supported PXIe slot in the chassis. PXIe-4310 modules can be placed only in the supported slot types identified in Table 1. Figure 1 shows the slot type symbols of the various slot types. Refer to your chassis documentation for more details.

Figure 1. PXIe/PXI Chassis Slot Type Symbol Location



1 Slot Type Symbols Locations

Table 1. PXIe-4310 Supported Slot Types

PXI Chassis Slot Type Symbol	Supported Slot Type Description
●	PXIe Peripheral
●H	PXI/PXIe Hybrid Peripheral
▣	PXIe System Timing or PXIe Peripheral

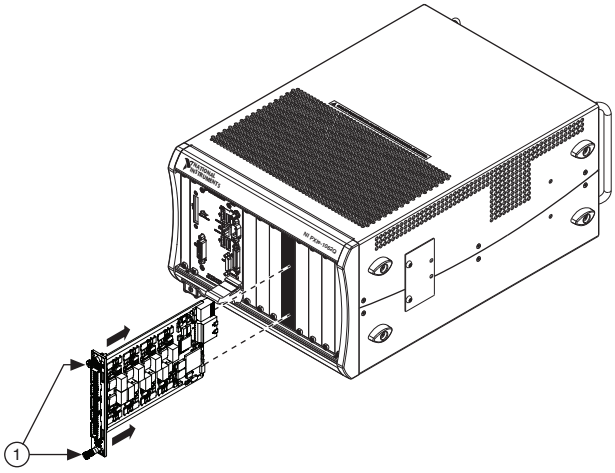
5. Remove the filler panel, and touch any metal part of the chassis to discharge static electricity.
6. Place the module edges into the module guides at the top and bottom of the slot.

Caution When installing the module, make sure both edges are positioned inside the guides and that the module components do not come into contact with adjacent modules.

7. Slide the module along the guides until it reaches the rear connector then seat the module by pushing the front panel until it is flush with the front panel of the chassis.

8. Secure the module to the chassis using the front-panel captive screws, shown in Figure 2. Tighten the screws to 0.31 N · m (2.7 lb · in.).
9. Install a filler panel in any empty slots.

Figure 2. Installing PXIe-4310 Modules



1 Captive Screws

Connect the Signals

Caution To ensure the specified EMC performance, operate this product only with shielded cables and shielded accessories. Use only twisted, shielded pair cables for channel connections. Refer to the *PXIe-4310 User Manual* for specific guidance on terminating cable shields.

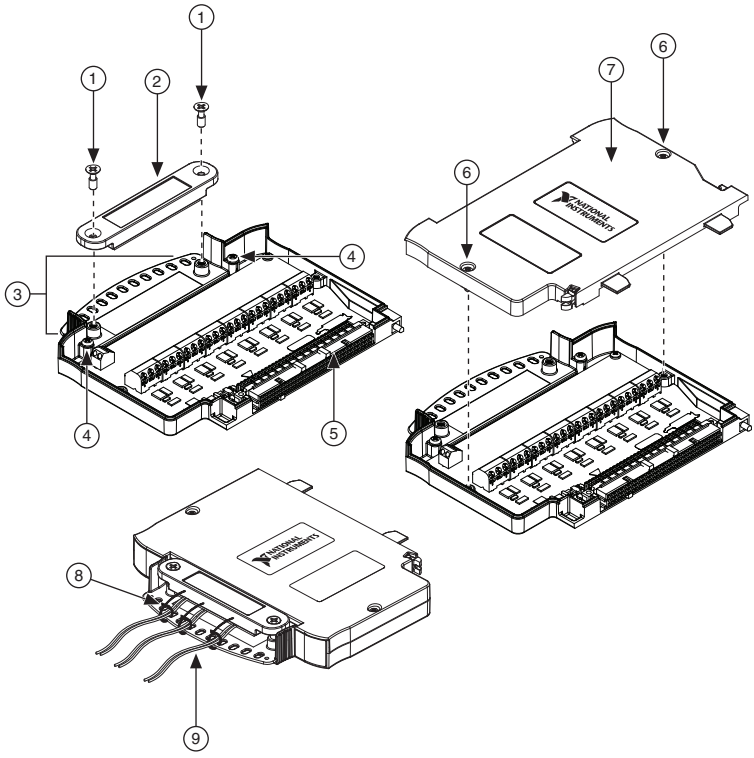
Caution Do not supply hazardous voltages (>30 V_{rms}/42.4 V_{pk}/60 VDC) to the terminal block without the terminal block being connected to the PXIe-4310.

A terminal block is required to make connections to the module. To connect signals to the TB-4310 (10V)/TB-4310 (600V) refer to Figures 3 and 4 while completing the following steps:

Note You can find the pinout names and locations in Measurement & Automation Explorer (MAX) at any time by right-clicking the device name under **Devices and Interfaces** and selecting **Device Pinouts**.

1. Loosen the captive top cover screws and remove the top cover.
2. Loosen the strain-relief screws and remove the strain-relief bar.
3. Prepare the shielded signal wire by stripping the insulation no more than 8 mm (0.24 in.).
4. Run the shielded signal wires through the strain-relief opening.

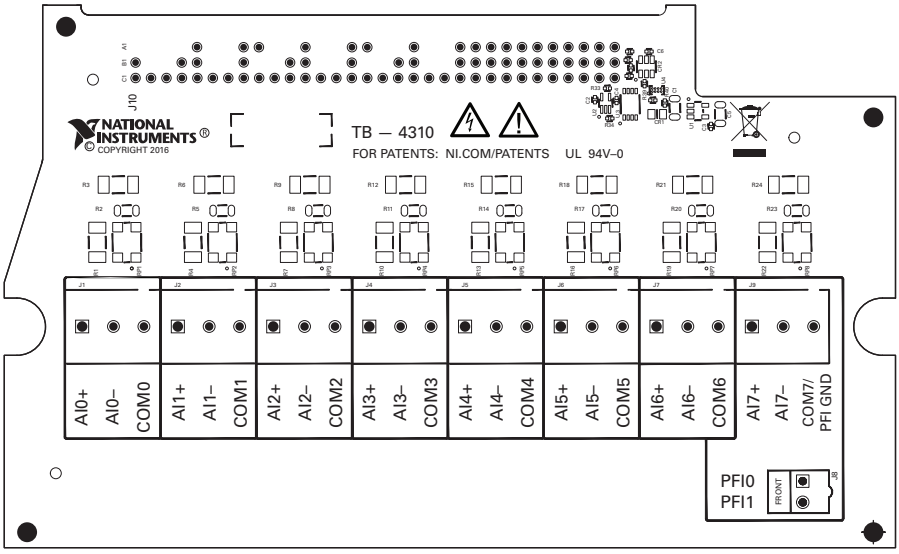
Figure 3. TB-4310 (10V)/TB-4310 (600V) Parts Locator Diagram



1	Strain-Relief Screws	4	Ground Lugs	7	Top Cover
2	Strain-Relief Bar	5	Terminal Block to Module Connector	8	Tie Wraps
3	Tie Wrap Holes	6	Captive Top Cover Screws	9	Shielded Signal Wires

5. Insert the stripped end of the shielded signal wires fully into the appropriate terminal. Refer to the label next to each screw terminal to determine the function of the terminal. The *PXIe-4310 User Manual* provides more detailed wiring information. Make sure no exposed wire extends past the screw terminal. Exposed wire increases the risk of a short circuit that can cause circuit failure.

Figure 4. TB-4310 (10V)/TB-4310 (600V) Circuit Board Parts Locator Diagram



Note Refer to the *PXIe-4310 User Manual* for wiring diagrams showing how to connect sensors to the TB-4310 (10V)/TB-4310 (600V).

6. Tighten the terminal screws to a torque of 0.2 to 0.25 N · m (1.77 to 2.21 lb · in.).

Caution Any wires connected to the ground lug must be sufficiently insulated from high voltage.

Note Refer to the *PXIe-4310 User Manual* for details about shielding the signals.

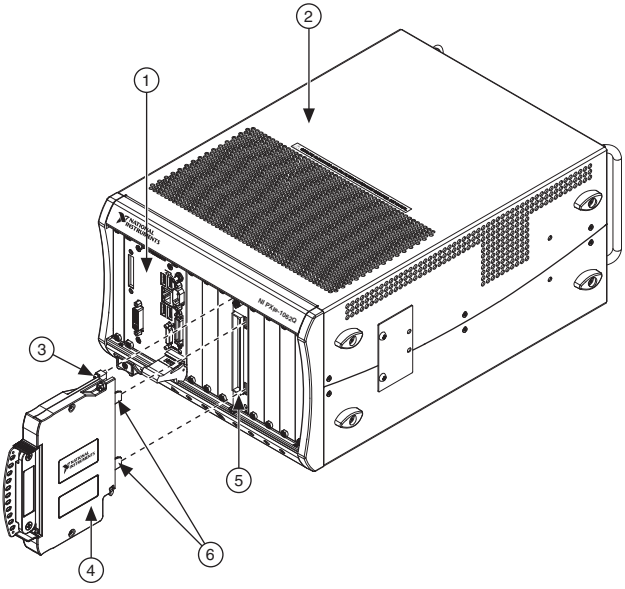
7. Reinstall the strain-relief bar and tighten the strain-relief screws.
8. Use tie wraps to connect the shielded signal wires to the tie-wrap holes for additional strain relief when necessary.
9. Reinstall the top cover and tighten the captive top cover screws.

Install the Terminal Block

Refer to Figure 5 to install the terminal block on the module while completing the following steps:

1. Move the terminal block into position in front of the module and engage the alignment feature with the guide on the associated module.

Figure 5. Installing the Terminal Block on the Module



1	PXI Express Controller	3	Mounting Screw	5	Module
2	PXI Express Chassis	4	Terminal Block	6	Alignment Feature

2. Attach the terminal block to the module by pushing the terminal block straight into the module. A spring mechanism will lock in the bottom of the terminal block.
3. Tighten the mounting screw at the top of the terminal block to attach it to the module.

Note For safety purposes and to prevent damage to equipment when high voltages are present, all PXIe-4310 modules and TB-4310 (10V)/TB-4310 (600V) terminal blocks are keyed to prevent connection between incompatible terminal blocks, modules, and/or cables.

4. Power on the chassis.

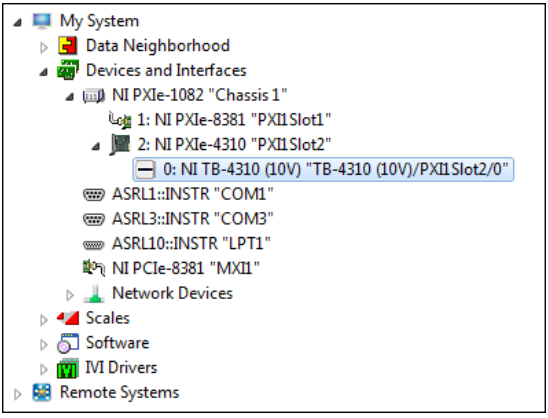
Confirm PXIe-4310 Module Recognition

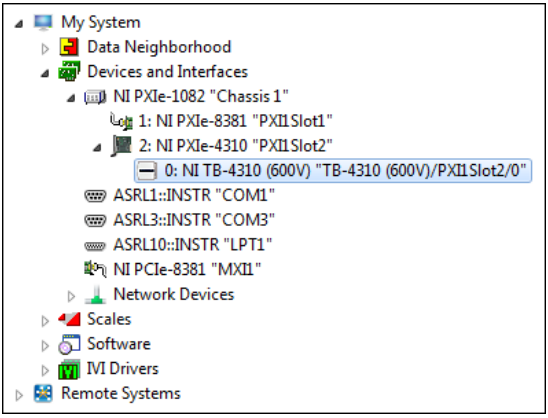
To confirm module recognition, complete the following steps:

1. Power on the system.
2. Launch MAX.



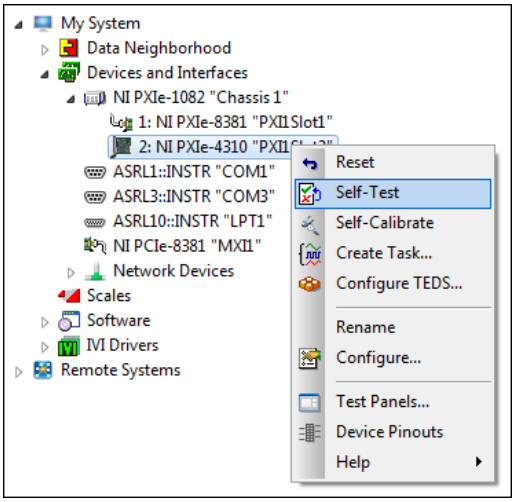
3. Expand **Devices and Interfaces**, and expand the chassis in which the module is located to confirm that MAX detects the module and terminal block. The terminal block should appear beneath its associated module. If your module or terminal block is not listed, press <F5> to refresh MAX. If the module is still not recognized, go to `ni.com/support/daqmx`.





Tip Using an NI-DAQmx simulated device, you can test NI-DAQmx applications without installing hardware. Refer to the *Create a Simulated Device* section for instructions for creating NI-DAQmx simulated devices.

4. Right-click the module name and select **Self-Test**. When the self-test completes, a verification message appears. If an error occurs, refer to `ni.com/support/daqmx`.



Device Self-Calibration

NI recommends that you self-calibrate your PXIe-4310 module after installation and whenever the ambient temperature changes. Self-calibration should be performed after the device has warmed up for the recommended time period. Refer to the device specifications to find your device warm-up time. This function measures the onboard reference voltage of the device and adjusts the self-calibration constants to account for any errors caused by short-term fluctuations in the environment.

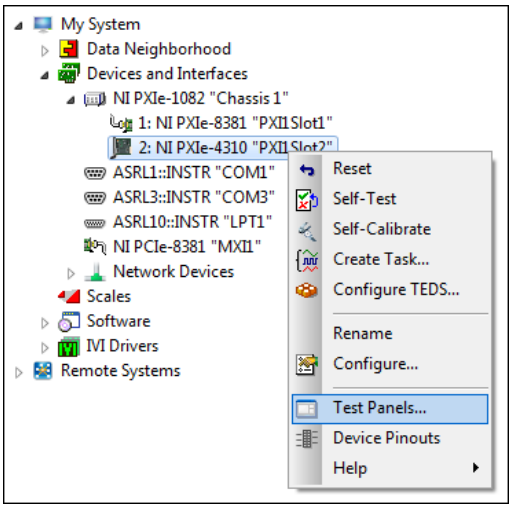
You can initiate self-calibration using Measurement & Automation Explorer (MAX), by completing the following steps:

1. Launch MAX.
2. Select **My System»Devices and Interfaces»*your device***.
3. Initiate self-calibration using one of the following methods:
   - Select the PXIe-4310 in the MAX configuration tree and click the **Self-Calibrate** button located on the MAX toolbar.
   - Right-click the name of the device in the MAX configuration tree and select **Self-Calibrate** from the drop-down menu.

Note You can also programmatically self-calibrate your device with NI-DAQmx, as described in *Device Calibration* in the *NI-DAQmx Help* or the *LabVIEW Help*.

Run Test Panels

1. In MAX, expand **Devices and Interfaces** select the chassis in which the module is located.
2. Right-click the device, and select **Test Panels**.



3. Click **Start** to test device functions, or **Help** for operating instructions.

To troubleshoot errors, refer to the *NI-DAQmx Help*, or go to `ni.com/support`.

Take an NI-DAQmx Measurement

NI-DAQmx Channels and Tasks

Refer to the *NI-DAQmx Help* for complete information about channels and tasks.

Use the DAQ Assistant to configure virtual channels and tasks in MAX or in your application.

Configure a Task Using the DAQ Assistant in MAX

Complete the following steps to create a task using the DAQ Assistant in MAX:

1. In MAX, right-click **Data Neighborhood** and select **Create New** to open the DAQ Assistant.
2. Select **NI-DAQmx Task** and click **Next**.
3. Select **Acquire Signals**.
4. Select the measurement type, such as Analog Input - Voltage.
5. Select the physical channel(s) to use and click **Next**.
6. Name the task and click **Finish**.

7. Configure the individual channel settings. Each physical channel you assign to a task receives a virtual channel name. To modify the input range or other settings, select the channel. Click **Details** for physical channel information. Configure the timing and triggering for your task. Click **Run**.

Use Your PXIe-4310 Module in an Application

For NI software version compatibility, refer to the *NI-DAQmx Readme*, available from **Start»All Programs»National Instruments»NI-DAQmx»NI-DAQmx Documentation**.

To get started with data acquisition in your application software, refer to the tutorials listed in Table 2.

Table 2. DAQ Assistant Tutorial Locations

Application	Tutorial Location
LabVIEW	Go to `ni.com` and search for `Taking an NI-DAQmx Measurement in LabVIEW`.
LabWindows/CVI	Go to **Help»Contents**. Next, go to **Using LabWindows/CVI»Data Acquisition»Taking an NI-DAQmx Measurement in LabWindows/CVI**.
Measurement Studio	Go to **NI Measurement Studio Help»Getting Started with the Measurement Studio Class Libraries»Measurement Studio Walkthroughs»Walkthrough: Creating a Measurement Studio NI-DAQmx Application**.
NI SignalExpress*	Go to **Help»Taking an NI-DAQmx Measurement in SignalExpress**.
* NI SignalExpress, an easy-to-use configuration-based tool for data logging applications, is at **Start»All Programs»National Instruments»NI SignalExpress**.	

Programming Examples

NI-DAQmx includes example programs to help you get started developing an application. LabVIEW and CVI examples are located at **Help»Find Examples** in your application software. Text-based code examples are located at **All Programs»National Instruments»NI-DAQmx»NI-DAQmx Examples**. Modify example code and save it in an application, or use examples to develop a new application or add example code to an existing application.

For other examples, go to `ni.com/info` and enter the Info Code `daqmxexp`.

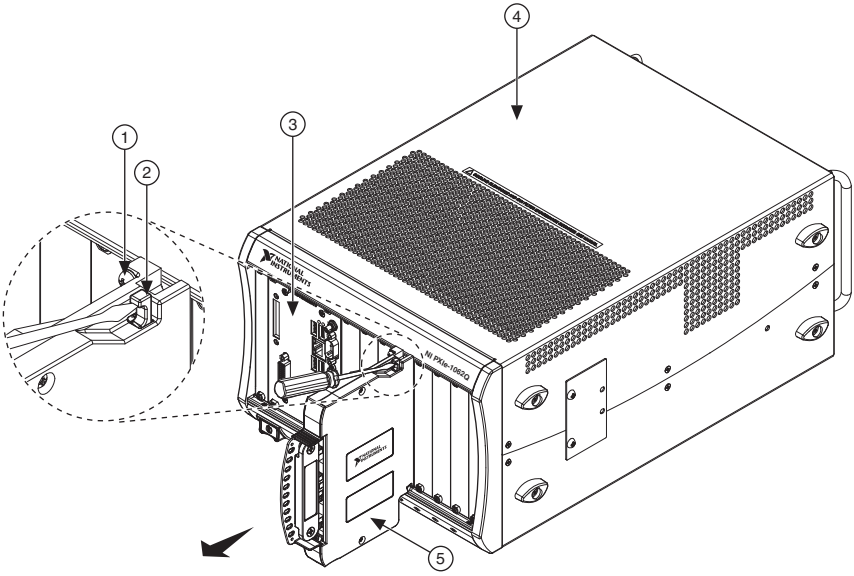
Terminal Block Removal

To remove the terminal block, refer to Figure 6 while completing the following steps:

Note The chassis can be powered on or off when removing the terminal block.

1. Ensure that the devices and circuits connected to the terminal block are powered down and are no longer hazardous live.
2. Loosen the terminal block mounting screw located at the top of the terminal block.
3. To remove the terminal block:
   a. Raise the latch release using a flathead screwdriver to disengage the latch.
   b. With the latch release raised, grasp the terminal block and pull it away from the module.

Figure 6. Removing the Terminal Block from the Module



1	Mounting Screw	3	PXI Express Controller	5	Terminal Block
2	Latch Release	4	PXI Express Chassis		

4. Store the terminal block in an antistatic protective bag.

Module Removal

Caution Do *not* remove a module with the power on. Doing so can damage the module.

To remove the module, refer to Figure 7 while completing the following steps:

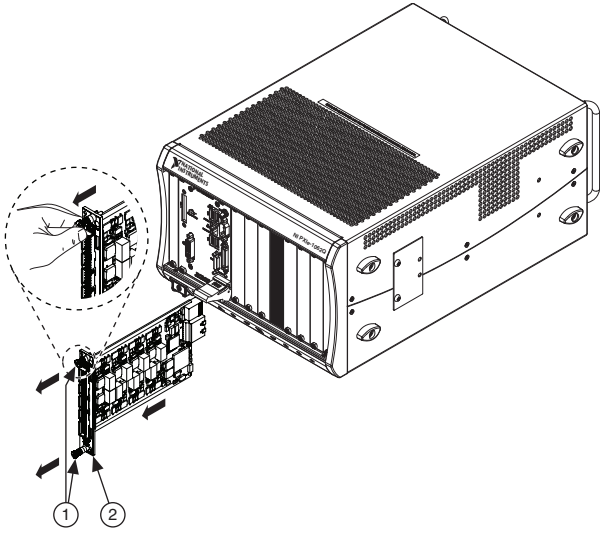
Note To maintain forced air cooling in the PXI Express system, refer to the *Maintain Forced-Air Cooling Note to Users*.

1. Make sure that the chassis is powered off before removing the module.
2. Loosen the captive screws on the top and bottom of the module.

Caution Do *not* pull the front panel to remove the module. Doing so may cause module components to come into contact with adjacent modules, causing damage to the modules.

3. Pull the captive screws to unseat the module and slowly slide the module along the guides.
4. Install a filler panel in the empty slot.
5. Store the module in an antistatic protective bag.

Figure 7. Removing PXIe-4310 Modules



1 Captive Screws (Use to remove modules.) 2 Front Panel (Do not use to remove modules.)

Create a Simulated Device

To run examples without the hardware installed, use an NI-DAQmx simulated device. To create a simulated device in MAX:

1. Launch MAX.
2. Right click **Devices and Interfaces»Create New**.
3. From the dialog, select **Simulated NI-DAQmx Device or Modular Instrument** and click **Finish**.
4. Type `4310` in the text box at the top of the window.
5. Select the device from the list provided.
6. Click **OK**.

Once you have created the simulated PXIe module, you can simulate the terminal block. To create a simulated TB-4310 (10V)/TB-4310 (600V) terminal block in MAX, complete the following steps:

1. Right-click the simulated PXIe module and select Configure.
2. Under Connector 0 on the Accessory tab, select the desired terminal block to simulate and click **Okay**.

Figure 8. TB-4310 (10V)

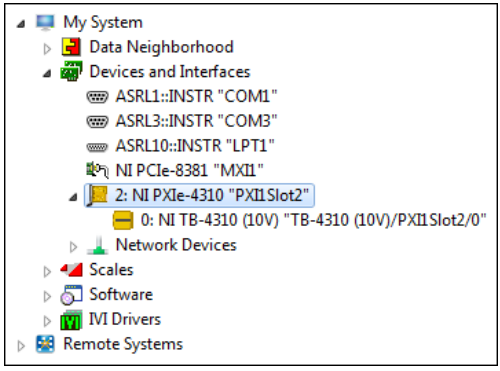
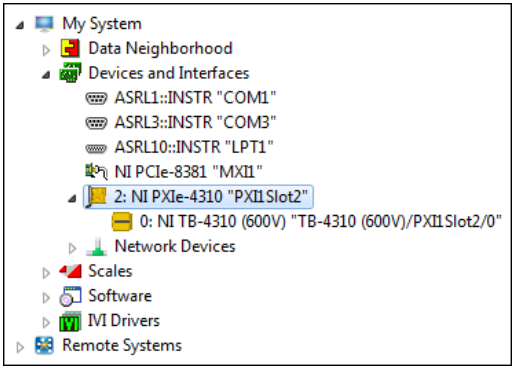


Figure 9. TB-4310 (600V)



More Information

After you install NI-DAQmx, the NI-DAQmx documentation is available from **Start»All Programs»National Instruments»NI-DAQmx»NI-DAQmx Documentation**. Additional resources are online at `ni.com/gettingstarted`.

You can access online device documentation by right-clicking your module in MAX and selecting **Help»Online Device Documentation**. A browser window opens to `ni.com/manuals` with the results of a search for relevant documents. If you do not have web access, documents for supported modules are included on the NI-DAQmx media.

Troubleshooting

- Go to `ni.com/kb`.
- If you need to return your National Instruments hardware for repair or device calibration, go to `ni.com/info` and enter `rdsenn` to start the Return Merchandise Authorization (RMA) process.

Specifications

All specifications are for both the TB-4310 (10V) and the TB-4310 (600V) unless otherwise noted.

Note PXIe-4310 module specifications are located in the *PXIe-4310 Specifications* document.

All performance specifications are *typical* unless otherwise noted. These specifications are valid within the full operating temperature range.

Calibration

Calibration interval ..... No calibration

Electrical

Analog input ranges

TB-4310 (10V) ..... ±10 V, ±5 V, ±2 V, ±1 V

TB-4310 (600V) ..... ±600 V, ±300 V, ±120 V, ±60 V

Input impedance (device on)

AI- to AI COM ..... >1 GΩ in parallel with 75 pF

AI+ to AI COM..... >1 GΩ in parallel with 75 pF

TB-4310 (600V)

AI+ to AI- ..... 2 MΩ

Typical Accuracy (TB-4310 600V)

INL error ..... 51 ppm of range

Nominal Range		Residual Gain Error (ppm of Reading)	Residual Offset (ppm of Range)	Offset Tempco (ppm of Range/°C)	Random Noise σ (mV_{rms})	Typical Accuracy at Full Scale (mV)
Positive Full Scale	Negative Full Scale					
600	-600	335	16	9	10.3	298
300	-300	336	21	9	5.5	149
120	-120	339	42	10	2.9	61
60	-60	345	75	13	2.3	33

Stability

Gain drift ..... 15 ppm/°C

Reference tempco ..... 5 ppm/°C

Attenuator Self-Heating ..... 26 µV/V for each volt beyond ±120 V

AI Typical Accuracy Equation

Accuracy = *Reading* * (*GainError*) + *Range* * (*Offset Error*) + *Self Heating* + *Noise Uncertainty*

Gain Error = *Residual Gain Error* + *Gain Tempco* * (*TempChangeFromLastInternalCal*) + *Reference Tempco* * (*TempChangeFromLastExternalCal*)

Offset Error = *Residual Offset Error* + *Offset Tempco* * (*TempChangeFromLastInternalCal*) + *INL_Error*

Self Heating = If Reading > 120 V, *Self-Heating* * (*Reading* - 120 V), otherwise 0.

Noise Uncertainty = $\frac{\textit{Random Noise} * 3}{\sqrt{10000}}$ for a coverage factor of 3 σ and averaging 10000 points.

Typical Accuracy Example

Accuracy at full scale is determined using the following assumptions:

- *TempChangeFromLastExternalCal* = 10 °C
- *TempChangeFromLastInternalCal* = 1°C
- *Number_of_readings* = 10000
- *CoverageFactor* = 3 σ

For example, on the 600 V range, the accuracy at full scale is as follows:

Gain Error = 335 ppm + 15 ppm * 1 °C + 5 ppm * 10 °C = 400 ppm

Offset Error = 16 ppm + 9 ppm * 1 °C + 51 ppm = 76 ppm

Self Heating = 26 µV/V * (600 V - 120 V) = 12.48 mV

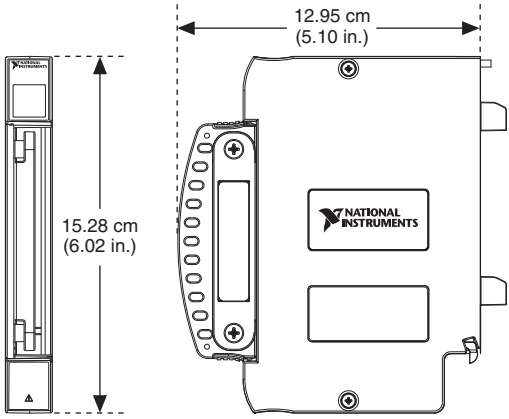
Noise Uncertainty = $\frac{10.3 \text{ mV} * 3}{\sqrt{10000}}$ = 309 µV

Typical Accuracy = 600 V * (*Gain Error*) + 600 V * (*Offset Error*) + *Self Heating* + *Noise Uncertainty* = 298 mV

Physical Characteristics

Screw terminal wire gauge ..... 2.08 mm^2 (14 AWG), max

Figure 10. Terminal Block Dimensions



Weight

TB-4310 (10V) ..... 618 g (21.8 oz)

TB-4310 (600V) ..... 595g (21.0 oz)

Caution Clean the hardware with a soft, nonmetallic brush. Make sure that the hardware is completely dry and free from contaminants before returning it to service.

Environmental

Maximum altitude..... 2,000 m (800 mbar), at 25 °C ambient temperature

Pollution Degree 2

Indoor use only

Operating Environment

Ambient temperature range ..... 0 °C to 55 °C
(Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2. Meets MIL-PRF-28800F Class 3 low temperature limit and MIL-PRF-28800F Class 2 high temperature limit.)

Relative humidity range..... 10% to 90%, noncondensing
(Tested in accordance with IEC 60068-2-56.)

Storage Environment

Ambient temperature range ..... -40 °C to 71 °C
(Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2. Meets MIL-PRF-28800F Class 3 limits.)

Relative humidity range..... 5% to 95%, noncondensing
(Tested in accordance with IEC 60068-2-56.)

Shock and Vibration

Operating shock..... 30 g peak, half-sine, 11 ms pulse
(Tested in accordance with IEC 60068-2-27. Meets MIL-PRF-28800F Class 2 limits.)

Random vibration

- Operating ..... 5 Hz to 500 Hz, 0.3 g_{rms}
- Non-operating..... 5 Hz to 500 Hz, 2.4 g_{rms}
  (Tested in accordance with IEC 60068-2-64. Non-operating test profile exceeds the requirements of MIL-PRF-28800F, Class 3.)

Safety Voltages

Maximum Input Voltage

Connect only voltages that are within the following limits.

TB-4310 (10V)

- AI+ to AI- ..... ±11 V
- AI- to COM ..... ±11 V

TB-4310 (600V)

- AI+ to AI- ..... 600 VDC/V_{pk}, Measurement Category O;
  300 V_{rms}, Measurement Category II
- AI- to COM ..... ±11 V

Isolation Voltages

Channel to channel[1] ..... 600 VDC/V_{pk}, Measurement Category O;
300 V_{rms}, Measurement Category II

Rated transient overvoltage ..... 2,500 V_{pk}

Channel to earth ground..... 600 VDC/V_{pk}, Measurement Category O;
300 V_{rms}, Measurement Category II

Rated transient overvoltage ..... 2,500 V_{pk}

Caution Do not connect the TB-4310 (10V)/TB-4310 (600V) to signals or use for measurements within Measurement Categories III, or IV.

Caution The protection provided by the TB-4310 (10V)/TB-4310 (600V) can be impaired if it is used in a manner not described in this document.

Safety Standards

This product meets the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA C22.2 No. 61010-1

Note For UL and other safety certifications, refer to the product label or the *Online Product Certification* section.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326-1 (IEC 61326-1): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- EN 55022 (CISPR 22): Class A emissions
- EN 55024 (CISPR 24): Immunity
- AS/NZS CISPR 11: Group 1, Class A emissions

[1] Measurement Categories CAT I and CAT O are equivalent. These test and measurement circuits are not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV. MAINS is a hazardous live electrical supply system that powers equipment. Measurement Category O is for measurements of voltages from specially protected secondary circuits, such as signal levels, special equipment, limited-energy parts of equipment, circuits powered by regulated low-voltage sources, and electronics.

Measurement Category II is for measurements performed on circuits directly connected to the electrical distribution system. This category refers to local-level electrical distribution, such as that provided by a standard wall outlet, for example, 120 V for U.S. or 240 V for Europe.

- AS/NZS CISPR 22: Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

Note In the United States (per FCC 47 CFR), Class A equipment is intended for use in commercial, light-industrial, and heavy-industrial locations. In Europe, Canada, Australia and New Zealand (per CISPR 11) Class A equipment is intended for use only in heavy-industrial locations.

Note Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.

Note For the standards applied to assess the EMC of this product, refer to the *Online Product Certification* section.

CE Compliance CE

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

- 2014/35/EU; Low-Voltage Directive (safety)
- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)

Online Product Certification

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for this product, visit `ni.com/certification`, search by model number or product line, and click the appropriate link in the Certification column.

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 *Minimize Our Environmental Impact* 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.

Waste Electrical and Electronic Equipment (WEEE)



EU Customers At the end of the product life cycle, all products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers, National Instruments WEEE initiatives, and compliance with WEEE Directive 2002/96/EC on Waste and Electronic Equipment, visit ni.com/environment/weee.

电子信息产品污染控制管理办法 （中国 RoHS）



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