PXI-2584 Features

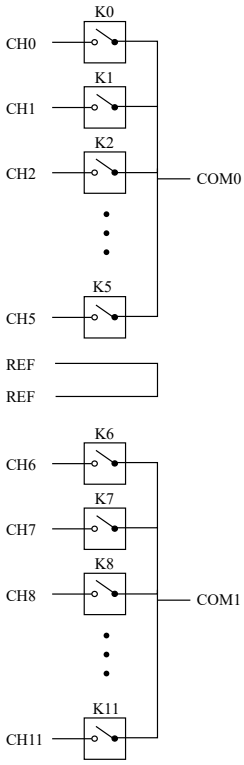
2025-03-20

Contents

PXI-2584 Overview

PXI-2584 Hardware Diagram

This figure shows the hardware diagram of the module.



PXI-2584 Pinout

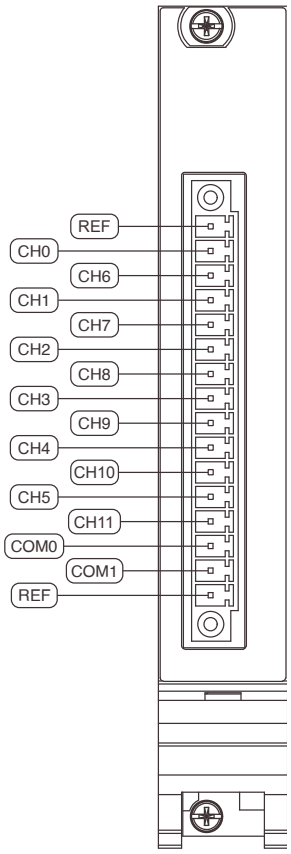


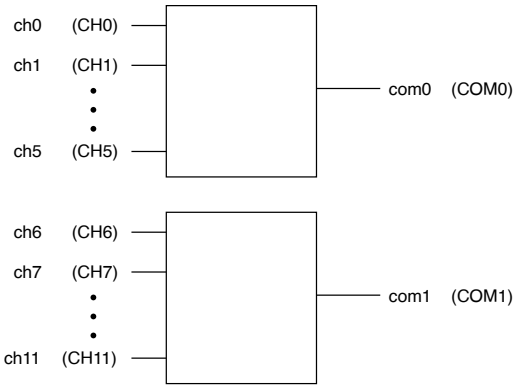
Table 1. Signal Descriptions

Signal	Description
CHx	Signal connection
COMx	Routing destination for corresponding signal connections
REF	Reference connection

PXI-2584 Topology

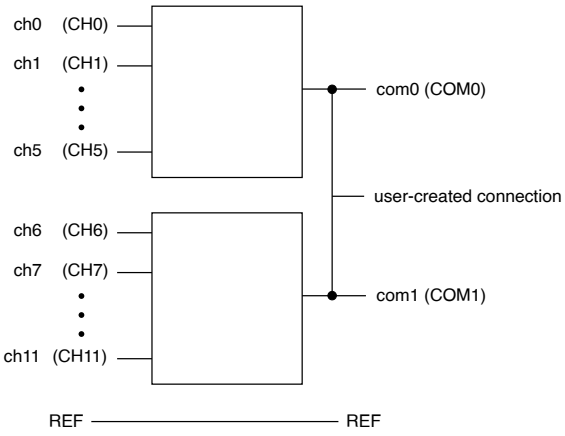
1-Wire Dual 6×1 Multiplexer

Software name: 2584/1-Wire Dual 6x1 Mux
(NISWITCH_TOPOLOGY_2584_1_WIRE_DUAL_6X1_MUX)



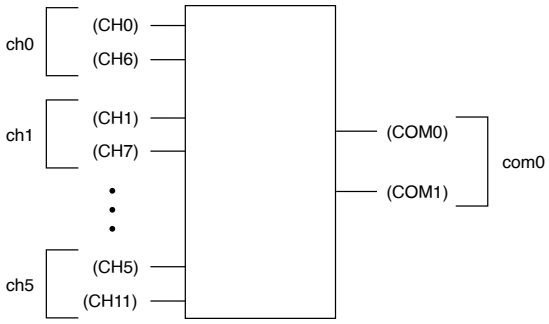
1-Wire 12×1 Multiplexer

Software name: 2584/1-Wire 12x1 Mux (NISWITCH_TOPOLOGY_2584_1_WIRE_12X1_MUX)



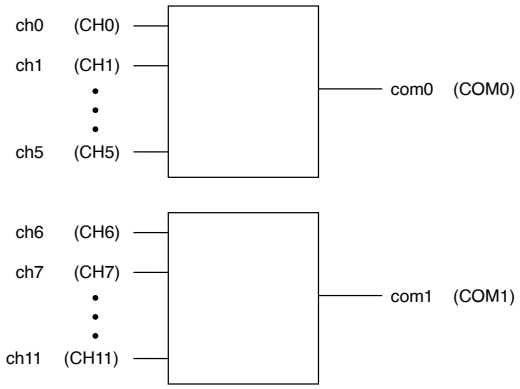
2-Wire 6×1 Multiplexer

Software name: 2584/2-Wire 6x1 Mux (NISWITCH_TOPOLOGY_2584_2_WIRE_6X1_MUX)



Independent Topology

Software name: 2584/Independent (NISWITCH_TOPOLOGY_2584_INDEPENDENT)



Note Use the Independent topology to configure the module for interleaved functionality. The user-implemented interleaved functionality is useful when measuring stacked signals—for example, battery stacks.

Making a Connection

1-Wire Dual 6×1 Multiplexer Topology and Independent Topology

Both the scanning command `ch2->com0;`, and the immediate operation, niSwitch Connect Channels VI or the `niSwitch_Connect` function with parameters `ch2` and `com0`, result in the following connection:

- signal connected to CH2 is routed to COM0

1-Wire 12×1 Multiplexer Topology

Both the scanning command `ch2->com0;`, and the immediate operation, niSwitch Connect Channels VI or the `niSwitch_Connect` function with parameters `ch2` and `com0`, result in the following connection:

- signal connected to CH2 is routed to COM0

Both the scanning command `ch7->com0;`, and the immediate operation, niSwitch Connect Channels VI or the `niSwitch_Connect` function with parameters `ch7` and `com0`, result in the following connection:

- signal connected to CH7 is routed to COM1

2-Wire 6×1 Multiplexer Topology

Both the scanning command `ch1->com0;`, and the immediate operation, niSwitch Connect Channels VI or the `niSwitch_Connect` function with parameters `ch1` and `com0`, result in the following connection:

- signal connected to CH1 is routed to COM0
- signal connected to CH7 is routed to COM1

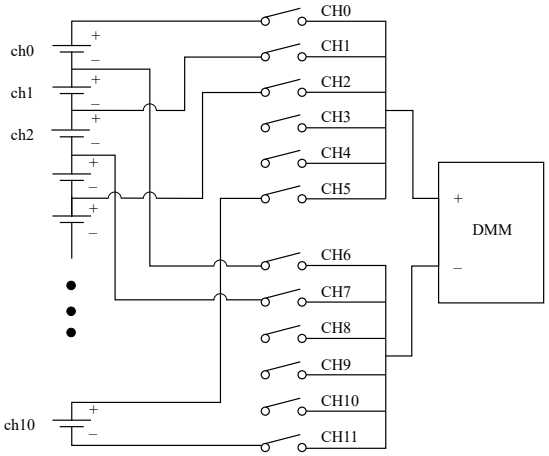
2-Wire 11×1 Interleaved Multiplexer (User-Implemented)

You can use the independent topology to create a 2-wire 11×1 multiplexer. The independent topology interleaves the two multiplexer banks of the module to create one interleaved multiplexer.

Interleaved multiplexing is useful for measuring stacked signals such as battery stacks where each channel shares a connection with the channels before and after it. By sharing connections you can nearly double the channel count while still maintaining 2-wire (differential) measurements.

A representation of an interleaved multiplexer is shown in the following figure. The channels of the interleaved multiplexer are shown on the left of the figure.

Figure 1. Interleaved Multiplexer



Note Signals connected to odd channels are measured in reverse polarity.

Note In multiple module operations, a straddled channel—an additional channel composed of the last channel of the first device (ch11) and the first channel of the second device (ch0)—is created between the two devices.

Use the Independent topology for both scanning and immediate operation of the module when using it as a 2-wire 11×1 interleaved multiplexer.

Single Module Scanning

In single module scanning, to measure signals as shown in the preceding figure, complete the following steps:

1. Close CH0, and CH6. The DMM measures the signal between CH0 and CH6.
2. Open CH0, and close CH1 (CH6 remains closed). The DMM measures the signal between CH1 and CH6, in reverse polarity.
3. Open CH6, and close CH7 (CH1 remains closed). The DMM measures the signal between CH1 and CH7.
4. Open CH1, and close CH2 (CH7 remains closed). The DMM measures the signal between CH2 and CH7, in reverse polarity.
5. Continue this pattern for the rest of the channels.
6. Open CH10, and close CH11 (CH5 remains closed). The DMM measures the signal between CH5 and CH11.

Refer to the following example for scan list syntax.

```
/Dev1/ch0->com0 & ch6->com1; ~ch0->com0 && ch1->com0;
~ch6->com1 && ch7->com1;...~ch10->com1 && ch11->com1;
~ch5->com0 & ~ch11->com1 &&
```

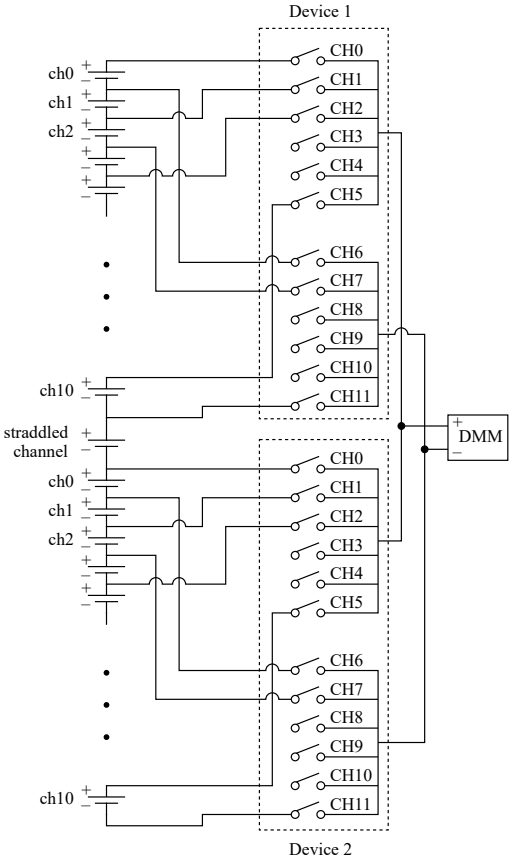
Note When calling the niSwitch Configure Scan List VI or the `niSwitch_ConfigureScanList` function, select `No Action` for the scan mode parameter.

Refer to the NI-SWITCH or the NI-DAQmx programming example for more information about single module scanning.

Multiple Module Scanning

In multiple module scanning, to measure signals on multiple devices, including the straddled channel signal as shown in the following figure, complete the following steps:

Figure 2. Straddled Channel Signal



1. Follow the steps in single module scanning to measure the signals on the first device.
2. Open CH5 on Dev1, and close CH0 on Dev2 (CH11 on Dev1 remains closed). The DMM measures the signal between CH11 on Dev1 and CH0 on Dev2 in reverse polarity.
3. Open CH11 on Dev1, and close CH6 on Dev2 (CH0 on Dev2 remains closed). The DMM measures the signal between CH0 on Dev2 and CH6 on Dev2.
4. Open CH0 on Dev2, and close CH1 on Dev2 (CH6 on Dev2 remains closed). The DMM measures the signal between CH1 on Dev2 and CH6 on Dev2 in reverse polarity.
5. Open CH6 on Dev2, and close CH7 on Dev2 (CH1 on Dev2 remains closed). The DMM measures the signal between CH2 on Dev2 and CH7 on Dev2.
6. Continue this pattern for the rest of the channels.
7. Open CH10 on Dev2, and close CH11 on Dev2 (CH5 on Dev2 remains closed). The DMM measures the signal between CH5 on Dev2 and CH11 on Dev2.

Refer to the following example for scan list syntax.

```
/Dev1/ch0->com0 & ch6->com1; ~ch0->com0 &&
ch1->com0;...~ch5->com0 && /Dev2/ch0->com0;
/Dev1/~ch11->com1 && /Dev2/ch6->com1; ~ch0->com0 &&
ch1->com0;...~ch10->com1 && ch11->com1; ~ch5->com0 &
~ch11->com1 &&
```

Note When calling the niSwitch Configure Scan List VI or the `niSwitch_ConfigureScanList` function, select `No Action` for the scan mode parameter.

Multiple module scanning is supported only in NI-DAQmx. Refer to the NI-DAQmx programming example for more information about multiple module scanning.

Interleaved Multiplexer Pinout

The module Pinout and the following table identify the pins when the module is used as a 2-wire 11×1 interleaved multiplexer.

Table 2. 2-Wire 11×1 Interleaved Multiplexer Signals

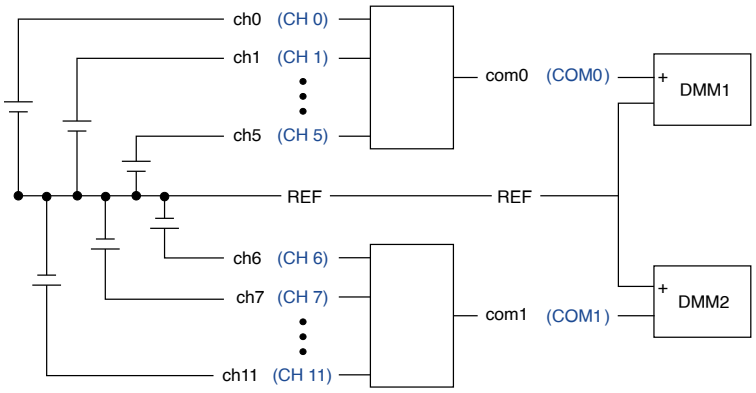
Interleaved Channel	Pin Name	
	+	–
ch0	CH0	CH6
ch1	CH6	CH1
ch2	CH1	CH7
ch3	CH7	CH2
ch4	CH2	CH8
ch5	CH8	CH3
ch6	CH3	CH9
ch7	CH9	CH4
ch8	CH4	CH10
ch9	CH10	CH5
ch10	CH5	CH11

Reference Signal Connections

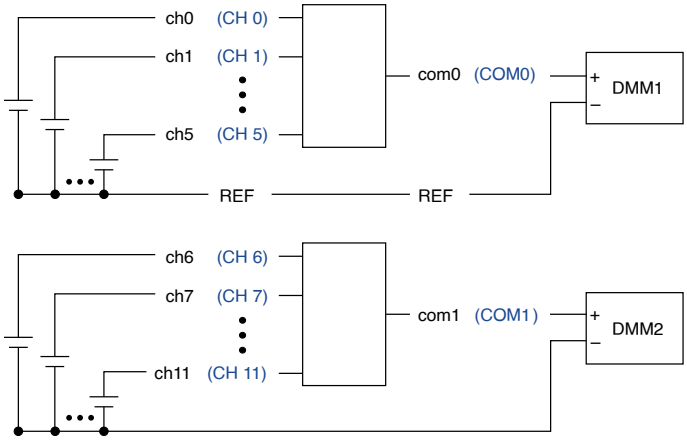
Use the two reference (REF) connections to lower emissions (noise) and preserve signal integrity. The reference connections should be electrically connected to each other at all times and used only in 1-wire topologies.

1-Wire Dual 6×1 Multiplexer Topology with Reference Connections

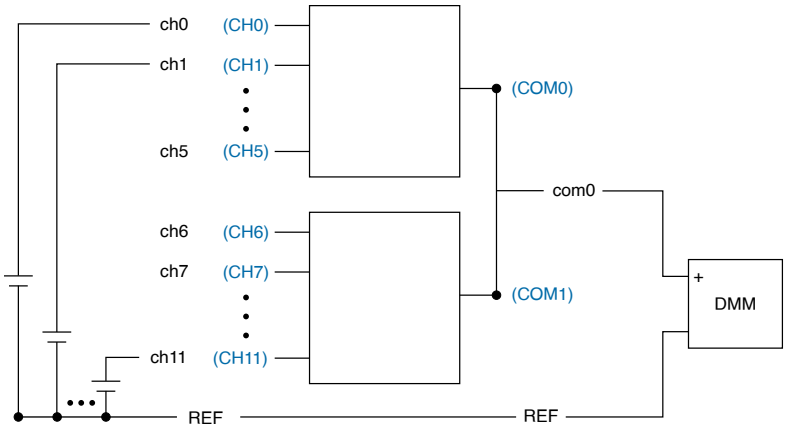
When the reference signals connected to both multiplexers are the same, connect the reference signals to REF, as shown in the following figure.



When the reference signals connected to both multiplexers are not the same, connect the reference signals of one multiplexer to REF and the reference signals of the other multiplexer directly to the measurement device, as shown in the following figure.



1-Wire 12×1 Multiplexer Topology with Reference Connections



PXI-2584 Relay Replacement

The module uses reed relays.

Refer to the following table for information about ordering replacement relays.

Replacement Relay Manufacturer	Part Number
Coto Technology	9104-05-11

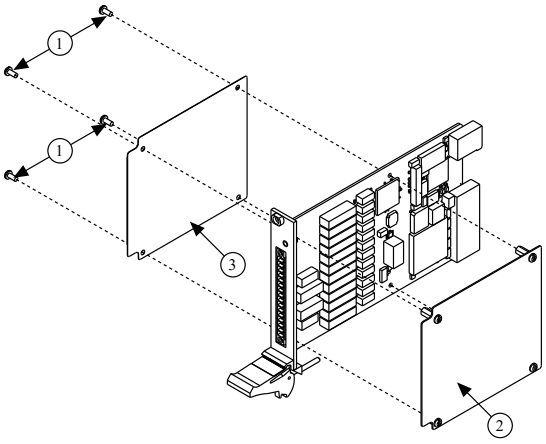
Complete the following sets of steps to disassemble your module and replace a failed relay.

Disassemble the Switch Module

1. Ground yourself using a grounding strap or a ground connected to your PXI chassis.

   Note Properly grounding yourself prevents damage to your module from electrostatic discharge.

2. Remove the four screws that secure the plastic cover on the top and plastic lead cover on the bottom of the switch assembly.

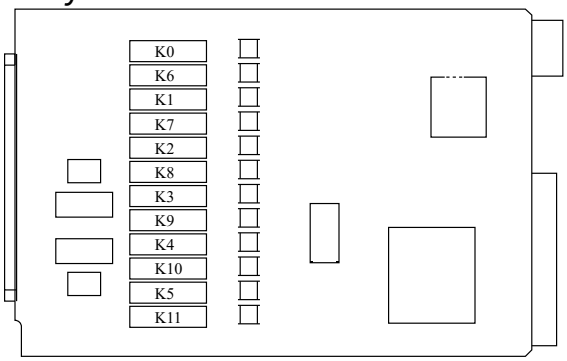


1 Screws	3 Plastic Lead Cover
2 Plastic Cover	

3. Carefully separate the adhered top cover absorber from the relays by slowly prying up on the cover.

> **Note** Some metal relay caps might come loose during this process and can be put back onto the relays after you have completed relay replacement.

4. Locate the relay you want to replace. Refer to the following figure and table for relay locations.



Channel Name	Relay Name
CH0	K0
CH1	K1

Channel Name	Relay Name
CH2	K2
CH3	K3
CH4	K4
CH5	K5
CH6	K6
CH7	K7
CH8	K8
CH9	K9
CH10	K10
CH11	K11

Replace the Relay

Ensure you have the following:

- Temperature-regulated soldering iron
  - Set to 371 °C (700 °F) for lead-free solder rework
  - Set to 316 °C (600 °F) for lead solder rework
- Solder
  - 96.5/3.0/0.5 Tin/Silver/Copper solder (flux core) for lead-free solder rework
  - 63/37 Tin/Lead solder (flux core) for lead solder rework
- Solder wick
- Fine pick
- Isopropyl alcohol
- Cotton swabs

Note NI recommends using lead-free solder for relay replacement on lead-free assemblies, and lead solder for relay replacement on lead assemblies.

Notice Do not rework lead assemblies using a lead-free work station. Lead solder from the unit could contaminate the station.

Notice If a lead-free assembly is reworked with lead solder, label the assembly to indicate this. This can prevent the same unit from being reworked later on a lead-free solder station, which could contaminate the station.

Replace the relay as you would any other through-hole part. Trim the replaced relay leads to under 1.2 mm (0.05 inch) protrusion.

Reassemble the Switch Module

Replace the top cover while carefully aligning the standoffs with the mounting holes in the module. Secure the bottom cover using the four screws removed above in Disassemble the Switch Module, step 2.

Tip Use the NI-SWITCH Switch Soft Front Panel to reset the relay count after you have replaced a failed relay. Refer to the ***Switch Soft Front Panel Help*** for more information.