

PXI Programmable Resistor Modules

PXI-2720, PXI-2722, PXIe-2725, and PXIe-2727



- **Software:** Includes interactive soft front panel, API support for LabVIEW and text-based languages, shipping examples, and detailed help files
- Software configurable as an RTD simulator, potentiometer, or low-power resistive load
- Built-in DMM port for easy connectivity and path verification
- Up to 16 k Ω range
- Resolution options of 0.25 Ω and 1 Ω
- Rated for 60 V or 300 mA

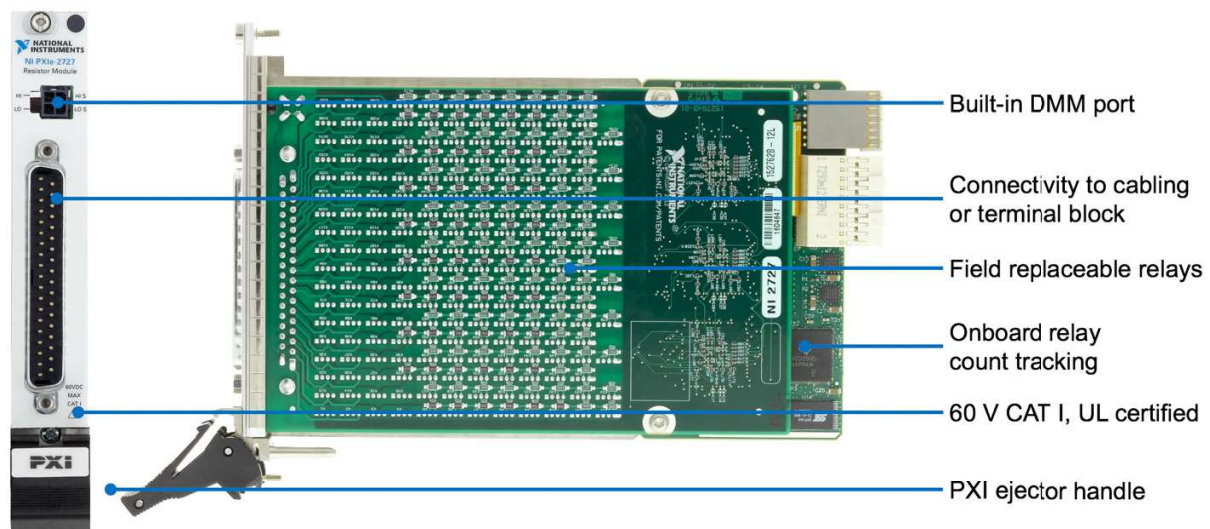
Built for Automated Test and Measurement

PXI Programmable Resistor Modules replicate the behavior of resistance-based devices by controlling a series of relays that varies resistance across each channel. The ability quickly and accurately vary resistance, with resolution down to 0.25 Ω , makes these devices well-suited for simulating environmental conditions in hardware-in-the-loop (HIL) validation. Each PXI Programmable Resistor Module uses a 37-pin D-SUB connector on the front panel to provide access to all channels, as well as a 2x2 Micro-Fit connector for easy connection to a PXI Digital Multimeter (DMM). The driver software provides a simple user interface that accepts inputs in units of temperature or resistance, and configures the resistance across each channel, without needing to directly control individual relays.

Table 11. NI offers a variety of PXI Programmable Resistor Modules, varying in resistance range, resolution, and density, allowing you to pick the model that best fits your needs.

	Number of Channels	Maximum Resistance	Resolution	Maximum Voltage	Maximum Current
PXI-2720	10	255 Ω	1 Ω	60 V	300 mA
PXI-2722	5	16 k Ω	0.25 Ω	60 V	300 mA
PXIe-2725	18	255 Ω	1 Ω	60 V	300 mA
PXIe-2727	9	16 k Ω	0.25 Ω	60 V	300 mA

Detailed View of PXIe-2727 Programmable Resistor Module



Key Features

Fully Programmable Resistance

Programmable resistors are test modules that replicate the behavior of resistance-based inputs and outputs such as potentiometers, RTDs, voltage dividers, and bridge elements. The total resistance across each channel, measured across the front connector terminals, is controlled by manipulating the circuit path resistance using relays to selectively route through discrete resistors. PXI Programmable Resistor Modules programmatically control the values of resistance appearing through an I/O connector, enabling usage in hardware-in-the-loop (HIL) validation, which performs rapid system tests during a variety of simulated system conditions.

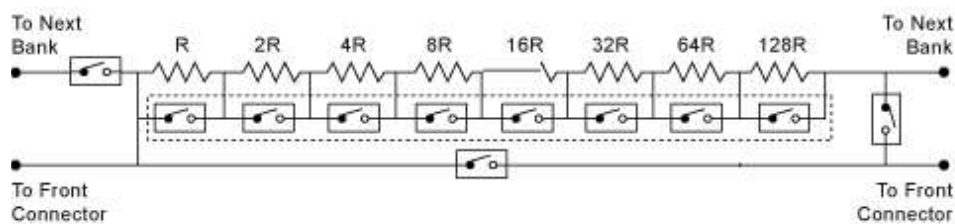
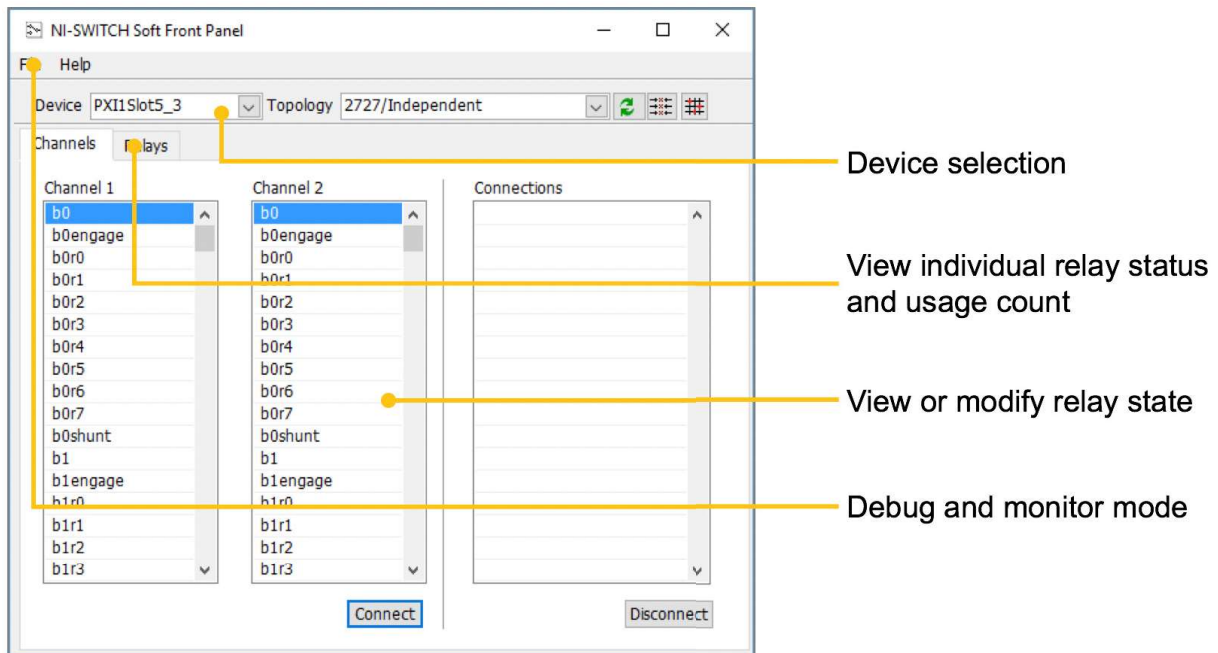


Figure 14. PXI Programmable Resistor Modules use banks of series resistors with optional, low-resistance parallel paths, enabled or disabled through relay actuation.

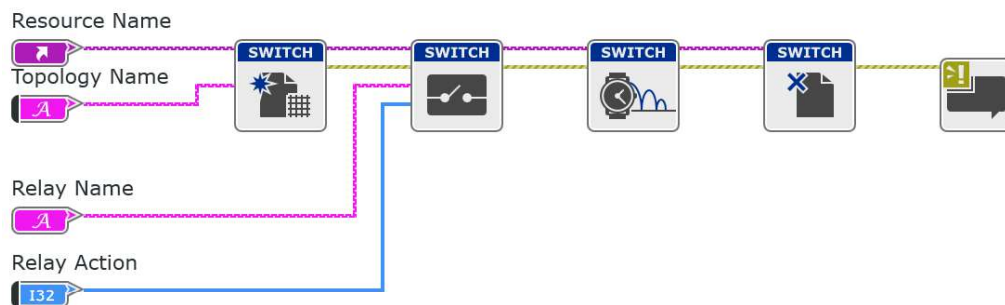
NI-SWITCH Soft Front Panel

The NI-SWITCH driver software includes an interactive soft front panel for full out-of-the-box functionality. This interactive soft front panel allows you to select the device and open or close individual relays with a simple click. In addition, you can use the **Debug Driver Session** mode to monitor and debug the device during automated measurement. For example, you can monitor which individual relays are open/closed and how many times each relay has been used, while a LabVIEW application uses the same device in an automated application.



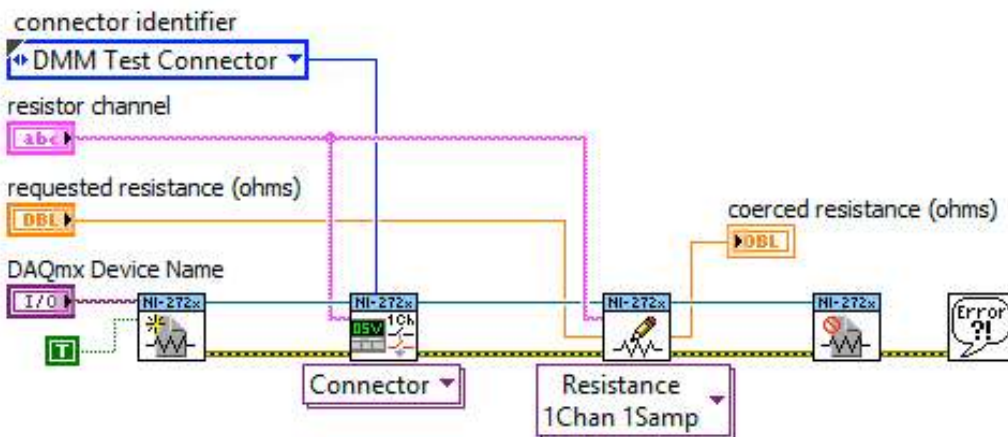
NI-SWITCH Application Programming Interface (API)

In addition to the soft front panel, the [NI-SWITCH driver](#) includes a best-in-class API that works with a variety of development options such as LabVIEW, C, C#, and others, allowing you to control individual relays within the PXI Programmable Resistor Module. The driver also provides access to help files, documentation, and dozens of ready-to-run shipping examples you can use as a starting point for your application.



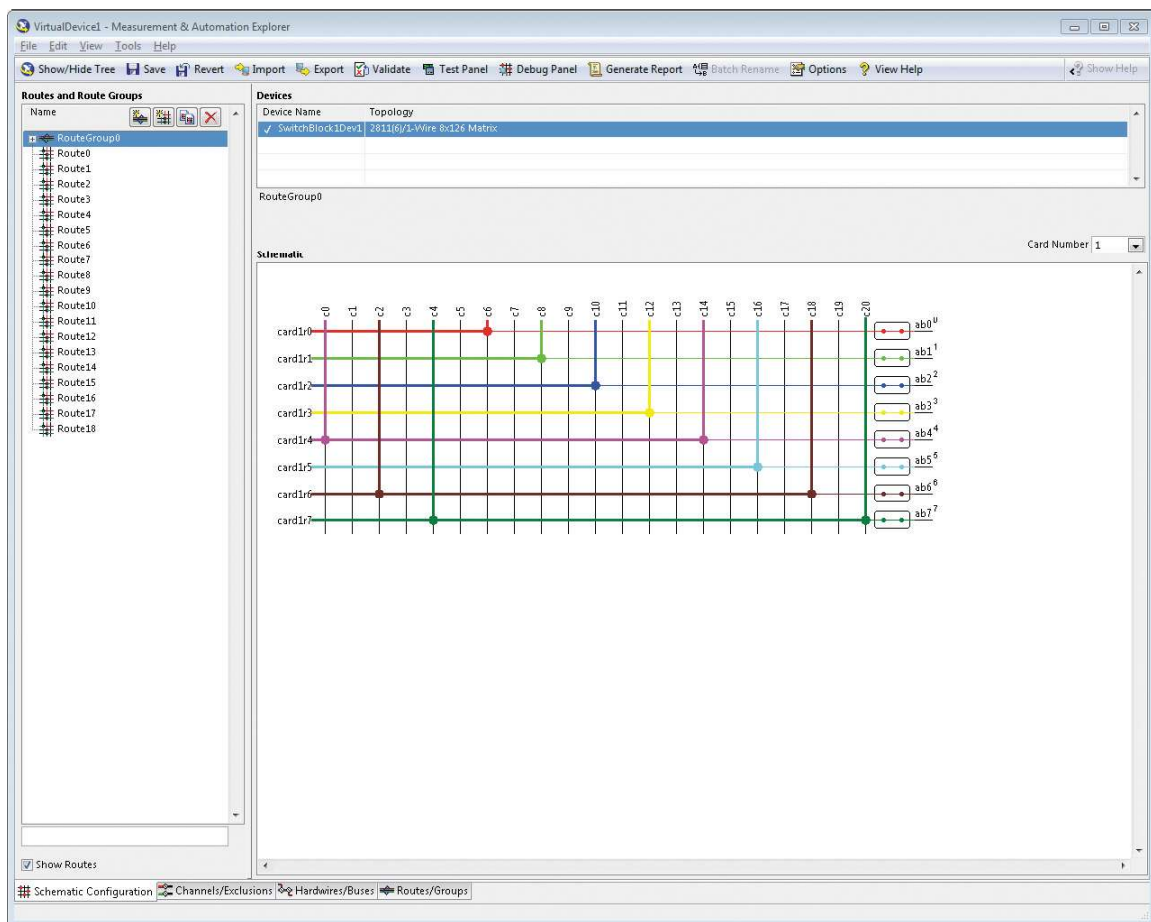
NI-272x Reference VIs

Low-level control of individual relays is available through NI-SWITCH driver, which supports LabVIEW, C, C#, and others. However, this will require manual calculations, control of individual relays, and low-level programming, which is not ideal for quick resistance or temperature changes. For a higher-level starting point, use the [NI-272x driver](#), which is available for LabVIEW and includes reference VIs and example programs for using a PXI Programmable Resistor Module as an RTD simulator, programmable potentiometer, or low-power resistive load. This software provides a simple user interface that accepts inputs in units of temperature or resistance, and configures the resistance across each channel.



Switch Executive Application Software

While the NI-SWITCH driver provides all the low-level functionality required to program switch actions, [Switch Executive](#) is application software for intelligent switch management and routing that accelerates development and simplifies maintenance of complex switch systems. The point-and-click graphical configuration and automatic routing capabilities make it easy to design your switch system. Using intuitive channel aliases and route names keeps your system documented for future modifications. Save time and increase test code reuse by integrating your system with TestStand, LabVIEW, LabWindows™ /CVI, and Measurement Studio.



- Graphically configure routes and route groups
- Develop reusable switching code and integrate it into NI TestStand or NI LabVIEW
- Automatically route signals between switch endpoints
- Scale switch configuration using Microsoft Excel
- Maintain switch configuration using route validation, reporting and debugging features