

Switch Introduction

To meet the needs of a wide range of uses in the measurement and automation field, switches come in a variety of types and sizes for versatile applications. It is important to understand the different types of switches available before selecting the most appropriate switch configuration.

General-Purpose (GP) Switches

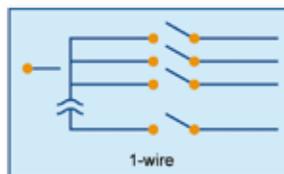
General purpose switches contain several independent relays which are isolated from each other. GP switches are commonly used to connect one input to one output and are usually built with Form A or Form C relays. The normal usage of GP switches is to turn on or turn off devices, such as motors, fans, heaters, and lights.

Multiplexers (MUX)

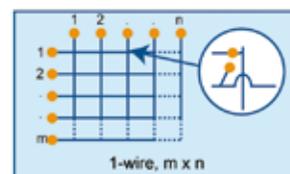
In test applications, the quantity of instruments is usually lower due to high cost. Thus, to connect multiple units under test (UUT) with the testing instrument, a multiplexer is always the choice to make the maximum utilization of the instruments. A 1-wire multiplexer routes single-ended signals to one point, and a 2-wire multiplexer selects differential signals. A 4-wire multiplexer is usually used to measure low resistance or RTDs. The instruments which are often used with multiplexer include DMM, digitizer and signal source, such as AWG, to provide both measurement and excitation.

Matrix

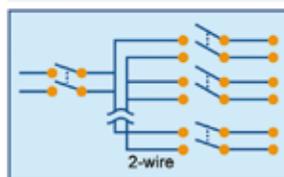
Matrix switches provide the most versatile switching capacity among these function topologies. In the matrix, any input can connect to any output individually or in combination. Unlike the multiplexer, the matrix can connect the source or measurement instrument to multiple UUTs at the same time. Matrix' advantage is the save of wiring. When users want to change the configurations of measurement or excitation, users just change the internal connection path, and do not have to manually reconfigure the wiring.



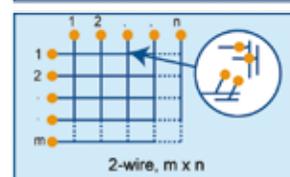
1-wire



1-wire, m x n



2-wire



2-wire, m x n

Figure 3 (Multiplexer)

Figure 4 (Matrix)

PXI-7901

16-CH General-Purpose SPDT Relay Module



Features

- PXI specifications Rev. 2.2 compliant
- 16-CH SPDT (1 Form C) non-latching relays
- Switching capacity: 3 A switching, 3 A carrying / 220 VDC, 250 VAC
- 125 operations per second for full settling
- Onboard 1 k-sample scan list for deterministic scanning
- Handshaking signals for external instruments synchronization
- Hardware emergency shutdown with programmable relay safety status
- 8 auxiliary 3.3 V/TTL digital inputs/outputs with 5 V tolerance

Supported Operating System

- Windows 2000/XP

Driver and SDK

- LabVIEW, MATLAB, Visual Studio, Visual Studio.NET

Software Utility

- ADL-SWITCH for Windows

Specifications

Relay Characteristics

- Number of channels: 16
- Relay type: SPDT (1 Form C), non-latching
- Switching capacity
 - Max. switching current: 3 A
 - Max. switching voltage: 220 V_{DC}, 250 V_{AC}
 - Max. switching power: 50 VA, 60 W
 - Max. carrying current: 3 A
- Contact resistance: 150 mΩ max.

Auxiliary Digital I/O

- Numbers of channel: 8 inputs/outputs
- Compatibility: 3.3 V/TTL (5 V tolerant)

Safety Functions

- Emergency shutdown
 - Logic level: 3.3 V/TTL (5 V tolerant)
 - Active: logic low

General Specifications

- I/O Connector: 62-pin D-sub male
- Operating temperature: 0 °C to 55 °C (32 °F to 131 °F)
- Storage temperature: -20 °C to 70 °C (-4 °F to 158 °F)
- Relative humidity: 5% to 85% non-condensing
- Power requirements: (when all relays are ON)
- Dimensions (not including connectors)
 - 160 mm x 100 mm (6.24" x 3.9")

Certifications

- EMC/EMI: CE, FCC Class A

Ordering Information

■ PXI-7901

16-CH General-Purpose SPDT Relay Module

* Failure rate indicates the lower limit of switching capacity of a relay contact at a reliability level of 60%

Terminal Boards & Cables

■ TB-6201-01

General-Purpose Switch Terminal Board with one 62-Pin D-Sub Female Connector for PXI-7901

■ ACL-10262

62-pin D-sub male/female cable, 1 M

(For more information about mating cables, please refer to P3-48.)

PXI-7921

24-CH 2-Wire Multiplexer Module



Supported Operating System

- Windows 2000/XP

Driver and SDK

- LabVIEW, MATLAB, Visual Studio, Visual Studio.NET

Software Utility

- ADL-SWITCH for Windows

Specifications

Source Wire	Multiplexer
1-wire	One 48x1
2-wire	One 24x1, Two 12x1, Four 6x1
4-wire	One 12x1

Relay Characteristics

- Number of channels: 24 (2-wire)
- Relay type: DPDT (2 Form C), non-latching
- Switching capacity
 - Max. switching current: 2 A
 - Max. switching voltage: 220 V_{DC}, 125 V_{AC}
 - Max. switching power: 60 W
 - Max. carrying current: 2 A
- Contact resistance: 100 mΩ max.

Safety Functions

- Emergency shutdown
 - Logic level: 3.3 V/TTL (5 V tolerant)
 - Active with logic low

General Specifications

- I/O Connector: 62-pin D-sub male
- Operating temperature: 0°C to 55°C (32°F to 131°F)
- Storage temperature: -20°C to 70°C (-4°F to 158°F)
- Relative humidity: 5% to 85% non-condensing

Certifications

- EMC/EMI: CE, FCC Class A

Ordering Information

- **PXI-7921**
24-CH 2-Wire Multiplexer Module

* Failure rate indicates the lower limit of switching capacity of a relay contact at a reliability level of 60%

Terminal Boards & Cables

- **TB-6221-01**
Multiplexer Switch Terminal Board with One 62-Pin D-Sub Female Connector for PXI-7921

- **ACL-10262**
62-pin D-sub male/female cable, 1 M

(For more information about mating cables, please refer to P3-48.)

PXI-7931

4x8 2-Wire Matrix Module



Supported Operating System

- Windows 2000/XP

Driver and SDK

- LabVIEW, MATLAB, Visual Studio, Visual Studio.NET

Software Utility

- ADL-SWITCH for Windows

Specifications

Source Wire	Multiplexer
2-wire	One 4x8, Two 4x4, One 2x16, Two 2x8, Four 2x4

Relay Characteristics

- Number of cross points: 32 (2-wire)
- Relay type: DPDT (2 Form C), non-latching
- Switching capacity
 - Max. switching current: 2 A
 - Max. switching voltage: 220 V_{DC}, 125 V_{AC}
 - Max. switching power: 60 W
 - Max. carrying current: 2 A
- Contact resistance: 100 mΩ max.

Auxiliary Digital I/O

- Numbers of channel: 8 inputs/outputs
- Compatibility: 3.3 V/TTL (5 V tolerant)

Safety Functions

- Emergency shutdown
 - Logic level: 3.3 V/TTL (5 V tolerant)
 - Active: logic low

General Specifications

- I/O Connector: 62-pin D-sub male
- Operating temperature: 0°C to 55°C (32°F to 131°F)
- Storage temperature: -20°C to 70°C (-4°F to 158°F)
- Relative humidity: 5% to 85% non-condensing
- Power requirements: (when all relays are ON)
- Dimensions
160 mm x 100 mm (not including connectors)

Certifications

- EMC/EMI: CE, FCC Class A

Ordering Information

- **PXI-7931**
4x8 2-Wire Matrix Module

* Failure rate indicates the lower limit of switching capacity of a relay contact at a reliability level of 60%

Terminal Boards & Cables

- **TB-6231-01**
Multiplexer Switch Terminal Board with One 62-Pin D-Sub Female Connector for PXI-7931

- **ACL-10262**
62-pin D-sub male/female cable, 1 M

(For more information about mating cables, please refer to P3-48.)

Features

- PXI specifications Rev. 2.2 compliant
- Configuration determined by terminal board
- Up to 32 cross-point DPDT (2 Form C) non-latching relays
- Contact rating
 - 2 A switching, 2 A carrying
 - 220 V_{DC}, 125 V_{AC}
- Onboard 1 k-sample scan list for deterministic scanning
- Hardware emergency shutdown with programmable relay safety status
- 8 auxiliary 3.3 V/TTL digital inputs/outputs with 5 V tolerance