

- Versatile Multiplexer With Single & Dual Operation
- User Configurable as: 16-Channel, 32-Channel or 64-Channel
- 1, 2 & 4-Pole Switching Formats, User Selectable
- Model 10-631A is Changeover Version
- Easy Expansion
- Switch up to 200Volts, 1.2A with 20W Max Power
- Automatic Isolation Switches Reduce Capacitive Loading in Large Systems
- Single or Multiple Channel Operation
- Uses High Reliability Pickering Ruthenium Reed Relays For Maximum Performance



***Please contact Pickering for alternative PXI/LXI/USB solutions**

The 10-630A range of Versatile Multiplexer Modules feature a wide range of user selectable switching configurations. Typical applications include signal routing in ATE and data acquisition systems.

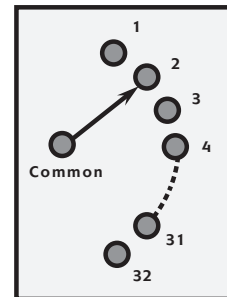
Each module may be set to either single or dual mode operation, with a choice of 1-pole, 2-pole, 4-pole or changeover switching action.

Connections are made via two front panel D-type connectors. Larger multiplexers may be constructed by cascading modules, with selected signals being routed via the front panel connectors.

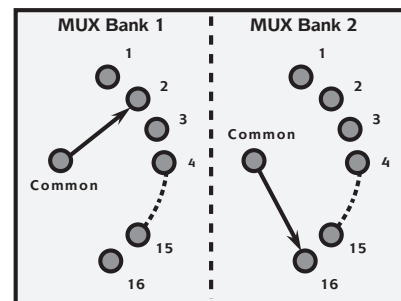
The 10-630A multiplexer may be operated as a conventional multiplexer with break-before-make action enforced when a new channel is selected. In addition multiple channels may be simultaneously selected, i.e. no break-before-make.

Available switch formats are 1-pole, 2-pole and 1-pole changeover, the modules are available with instrument grade sputtered Ruthenium Reed Relays which have high reliability and are excellent for switching very low level signals. Mercury wetted reed switches may be available to special order.

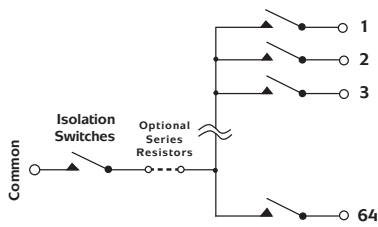
A **limiting resistor** can be fitted (see switching schematics), this may be very useful in preventing high current in-rushes which may result in permanent damage to the reed switch.



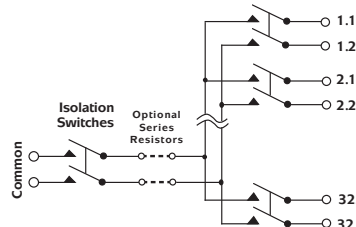
Single Multiplexer Mode: 16, 32 or 64-Channels



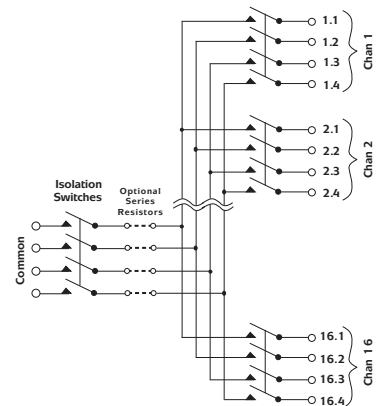
Dual Multiplexer Mode: 16 or 32-Channels



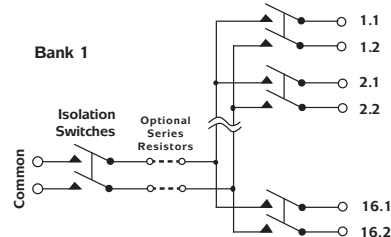
10-630A-0X2 Single 64-Channel 1-Pole Multiplexer Mode



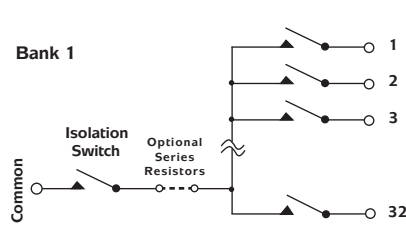
10-630A-0X2 Single 32-Channel 2-Pole Multiplexer Mode



10-630A-0X2 Single 16-Channel 4-Pole Multiplexer Mode

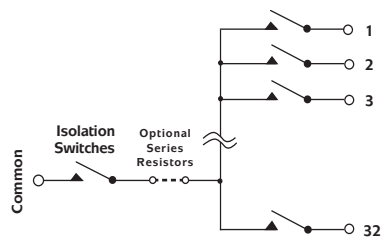


10-630A-0X2 Dual 16-Channel 2-Pole Multiplexer Mode

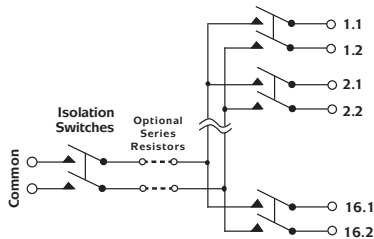


10-630A-0X2 Dual 32-Channel 1-Pole Multiplexer Mode

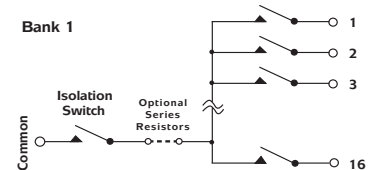
10-630A-0X2 High Density Multiplexer Configuration Schematics



10-630A-0X1 Single 32-Channel 1-Pole Multiplexer Mode

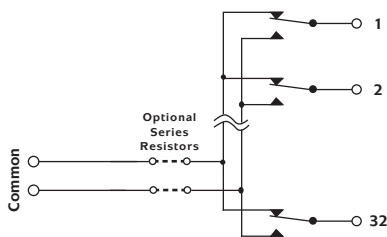


10-630A-0X1 Single 16-Channel 2-Pole Multiplexer Mode

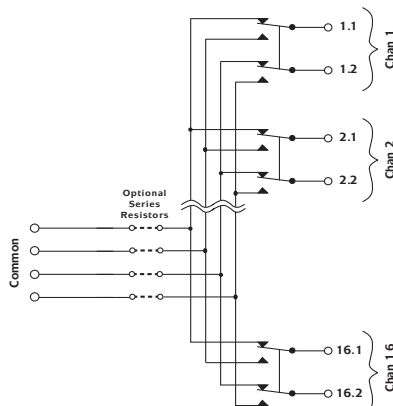


10-630A-0X1 Dual 16-Channel 1-Pole Multiplexer Mode

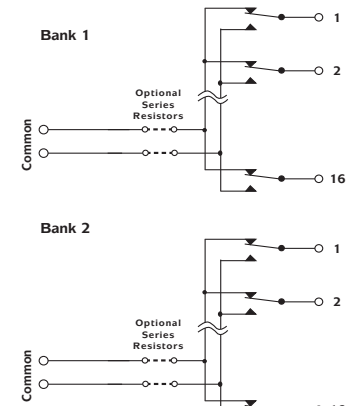
10-630A-0X1 Low Density Multiplexer Configuration Schematics



10-631A-0X1 Single 32-Channel 1-Pole Changeover Multiplexer Mode



10-631A-0X1 Single 16-Channel 2-Pole Changeover Multiplexer Mode



10-631A-0X1 Dual 16-Channel 1-Pole Changeover Multiplexer Mode

10-631A-0X1 Changeover Multiplexer Configuration Schematics

Relay Type

The module uses Ruthenium Reed Switches. Mercury Wetted Reed Switches may be available to special order. **Spare reed relays** are built onto the circuit board to facilitate easy maintenance with minimum downtime.

All reed relays are manufactured by our sister company Pickering Electronics: pickeringrelay.com

Switching Specification

Switch Type:	Ruthenium	Mercury wet †
Max Standoff Voltage:	200V†	200V
Max Power:	20W	50W
Max Switch Current:	0.5A (0.25)‡	2.0A (1.0)‡
Max Carry Current:	1.2A	4.0A (2.0)‡
Contact Resistance		
On (Single Module):	<300mΩ	<300mΩ
On (5 Module System):	<700mΩ	<700mΩ
Off (Single Module):	>10 ⁹ Ω	>10 ⁹ Ω
Off (5 Module System):	>10 ⁹ Ω	>10 ⁹ Ω
Differential Thermal Offset:	<5μV	<15μV
Capacitance		
Open Channel:	<6pF	<6pF
Channel to Channel:	<15pF	<15pF
Crosstalk (Single Channel On, 50Ω)		
Channel to Channel 10kHz:	>90dB	>90dB
Channel to Channel 100kHz:	>70dB	>70dB
Channel to Channel 1MHz:	>50dB	>50dB
Bank to Bank 100kHz:	>100dB	>100dB
Bank to Bank 100kHz:	>85dB	>85dB
Bandwidth (3dB, 1 module):	>20MHz	>20MHz
Noise Level (0 to 1MHz in 50Ω system):		
	<-80dBm	<-80dBm
Max Operate Time:	7ms	11ms
Max Release Time:	6ms	9ms
Expected Life		
Low power load:	>1x10 ⁸	>1x10 ⁹
Full power load:	>1x10 ⁶	>1x10 ⁸

† Mercury wet versions may be available to special order.

‡ Bracketed figures apply to 10-631A only.

Safety & CE Compliance

All modules are fully CE compliant and meet applicable EU directives: Low-voltage safety EN61010-1:2010, EMC Immunity EN61326-1:2013, Emissions EN55011:2009+A1:2010.

10-630A Versatile Multiplexer Configurations

The 10-630A/631A multiplexer modules can all be quickly user configured (using internal jumpers) to any of the modes in the table below, please refer to the schematic diagrams opposite:

Type 10-630A-0X2, High Density Multiplexer		
Dual	16-Channel	2-Pole (default config.)
Dual	32-Channel	1-Pole
Single	16-Channel	4-Pole
Single	32-Channel	2-Pole
Single	64-Channel	1-Pole
Type 10-630A-0X1, Low Density Multiplexer		
Dual	16-Channel	1-Pole (default config.)
Single	16-Channel	2-Pole
Single	32-Channel	1-Pole
Type 10-631A-0X1, Changeover Multiplexer		
Dual	16-Channel	1-Pole (default config.)
Single	16-Channel	2-Pole
Single	32-Channel	1-Pole

Common

The common signal(s) are routed to the Front panel connectors allowing the user complete flexibility in system design. This also has the additional features of keeping the signal(s) isolated, improving crosstalk, dc leakage and low thermal emf performance.

Creating Larger Multiplexers

When more than one module is used to make up a multiplexer ie. where five modules are used to make up a 320 channel 1 pole multiplexer – then all multiplexer units must have the same internal address, the location of each module within the multiplexer is given by its own bank address. Bank addresses must start at 0 and should be contiguous.

If there is a problem with any of the modules used to make up a large multiplexer then an error will be detected (use the REPORT? query to discover the cause). If only one multiplexer module is used then bank address 0 must always be used.

Mechanical Characteristics

All models conform to the 3U height (128mm) Eurocard standard and are housed in a 160mm deep screened plug-in module. Panel width for all versions is 2.4 Inches.

Connectors

Connections are made via two front panel mounted 37-pin D-type plugs. Please note that these connectors are spaced closely together so care must be taken to use mating connectors that will fit onto the front panel together.

Product Order Codes - High Density Multiplexer

High Density MUX, Ruthenium Switch 10-630A-022

Note: When ordering you may specify that the multiplexer is configured into any of the Shipping Configuration modes shown below, this saves having to alter internal jumpers yourself upon receipt of the unit.

Shipping Configurations - High Density Multiplexer

Multiplexer mode	Dual		Single		
Number of Channels	16	32	16	32	64
Number of Poles	2	1	4	2	1
Configuration	16/2	32/1	16/4	32/2	64/1

Product Order Codes - Low Density Multiplexer

Low Density MUX, Ruthenium Switch 10-630A-021

Shipping Configurations - Low Density Multiplexer

Multiplexer mode	Dual	Single	
Number of Channels	16	16	32
Number of Poles	1	2	1
Configuration	16/1	16/2	32/1

Product Order Codes - Changeover Multiplexer

Changeover MUX, Ruthenium Switch 10-631A-021

Shipping Configurations - Changeover Multiplexer

Multiplexer mode	Dual	Single	
Number of Channels	16	16	32
Number of Poles	1	2	1
Configuration	16/1	16/2	32/1

Product Customization

Pickering System 10 modules are designed and manufactured on our own flexible manufacturing lines, giving complete product control and enabling simple customization to meet very specific requirements.

Customization can include:

- Alternative relay types
- Mixture of relay types
- Alternative number of relays
- Different performance specifications

All customized products are given a unique part number, fully documented and may be ordered at any time in the future. Please contact your local sales office to discuss.

Mating Connectors & Cabling

37-Pin D-type Socket with Crimp Pins 10-960-037

For other 37-pin connection accessories for the 10-630A series modules please refer to the [90-007D](#) 37-pin D-type Connector Accessories data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

Programming

The 10-630A multiplexer module is simple to program:

ARESET a Open all channels on device **a**

DELAY t Force a minimum delay of **t** milliseconds between two instructions

RESET Open all switches on all modules

VIEW? a View status of device **a**

CHAN a,c Select channel **c** on multiplexer **a**. Automatically clears previous channel (if set) before selecting new channel. When in dual multiplexer mode the address is prefixed by 1 or 2

CHAN a,c,s Multi-channel selection argument **s** allows opening/closing of any combination of channels. Also allows selection of all channels except **c** (Not available in 1-Pole Mode)

Operating/Storage Conditions

Operating Conditions

Operating Temperature: 0°C to +55°C
 Humidity: Up to 95% non-condensing
 Altitude: 5000m

Storage and Transport Conditions

Storage Temperature: -20°C to +75°C
 Humidity: Up to 95% non-condensing
 Altitude: 15000m