ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Pickering 20-610-022* at our website: ***Click HERE***

20-610
Universal Multiplexer Module

- Very High Density 352 Pin Multiplexer
- Single, Dual or Quad Multiplexer Operation, Switching 1, 2, 4 or 8 Poles
- Expandable to 10,000 Channels Using Internal Analogue Bus
- Automatic Isolation Switches Reduce Capacitive Loading in Large Systems
- High Quality Ruthenium Reed Relays For Maximum Reliability
- Built-In Self Test
- Suitable for Ribbon Cable Connection
- Versatile Configuration Options: "One Module for ALL Your General Purpose Multiplexer Applications"
- Built-In RS-232 Port
- Lower Density 176 Pin Version Available



The 20-610 Universal 352 Pin Multiplexer Module is the first in a new generation of very high density multiplexers from Pickering Interfaces. One standard module offers a very large range of switching configurations plus extensive built in self-test.

Model 20-610 offers very highest density multiplexing with 352 switch pins. Configurable as a single, dual or quad multiplexer with a choice of 1, 2, 4 or 8 pole switching and is expandable to over 10,000 channels.

Universal Multiplexer - *For Now & The Future*

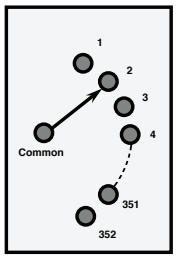
The 20-610 may be easily configured for most general purpose multiplexer requirements. Just by setting on-board links the unit may be configured as a single, dual or quad multiplexer with a choice of 1, 2, 4 or 8 pole operation (total of 18 configurations). The analogue common/s may be routed to the front panel or, for large system implementation, to one of the internal analogue buses. This versatility means that one multiplexer module is suitable for many different applications.

For applications that require lower capacity a reduced density version, type 20-610-021, is available, this has 176 pins.

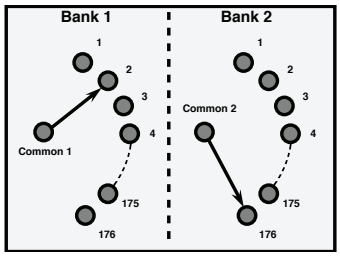
Simple Internal Expansion to 10,000 Channels

Up to 2816 input channels can be accommodated in one System 20 Case, over 10,000 with multiple expansion cases.

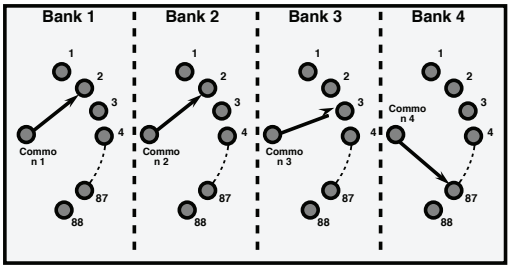
Built-in Automatic Isolation Switching connects only the currently active multiplexer switch bank, thereby keeping capacitive loading and leakage currents in large multiplexer systems to a minimum.



Single MUX Mode: 44, 88, 176 or 352 Channels



Dual MUX Mode: 44, 88 or 176 Channels



Quad MUX Mode: 44 or 88 Channels

Programming

The 20-610 Multiplexer module is simple to program:-

ARESET a	Open all channels on device **a**.
CHAN a,c	Select channel **c** on multiplexer **a**. When in dual mode the address is prefixed by 1 or 2 (in quad mode by 1, 2, 3 or 4).
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 on very high density 20-610-022).
DELAY t	Force a minimum delay of **t** milliseconds between two instructions
DIAGNOSTIC?	Report any Self Test errors.
RESET	Open all switches on all modules
VIEW? a	View status of device **a**.

20-610 module must be used in conjunction with the 10-921 or 20-910 interface module (it is not compatible with the older 10-920 interface).

Self Test

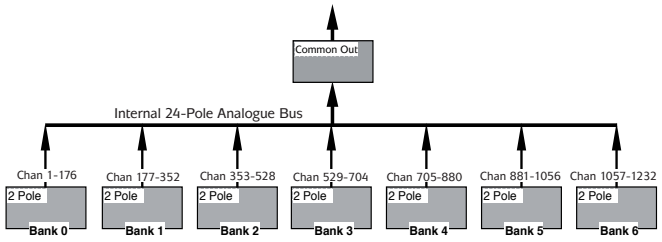
Self-Test is invoked at power on and may also be operated under software (*TST?). Self-Test pass is indicated on a front panel LED with a full pass/fail description available using the DIAGNOSTIC? command. Self-Test comprises 2 levels:-

1. **Logic Test**
2. **Relay Coil Test**

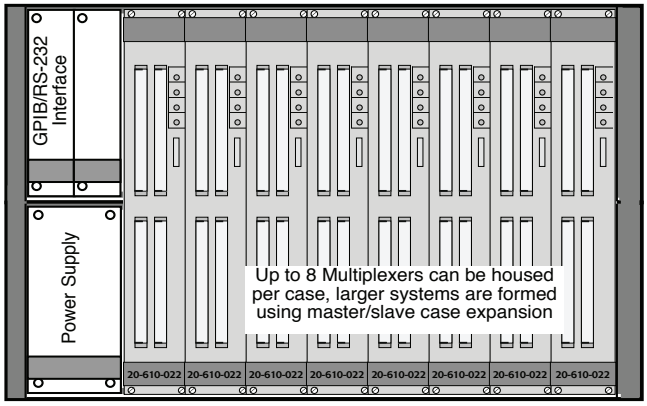
In the unlikely event of a relay needing replacement spare relays are built into 20-610 module.

Creating Larger Multiplexers

When more than one module is used to make up a multiplexer – see diagram below, where seven modules are used to make up a 1232 channel 2-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).



Specification - 20-610 MUX System†

Switch Type:	Ruthenium Reed
Max Standoff Voltage:	100V
Max Power:	10W
Max Switch Current:	0.5A
Max Carry Current:	1.2A
Path Resistance	
On (Single Module):	500mΩ (typical)
Off (Single Module):	>10^9Ω
Differential Thermal Offset:††	<30µV
Capacitance Open Channel:	<6pF
Capacitance Channel to Channel:	<30pF
Crosstalk (Single Channel 50Ω)	
Channel to Channel - 10kHz:	>80dB
Channel to Channel - 100kHz:	>65dB
Channel to Channel - 1MHz:	>45dB
Bank to Bank - 100kHz:	>80dB
Bank to Bank - 1MHz:	>65dB
Bandwidth (3dB, 1 module):	5MHz
Noise Level (0 to 1MHz in 50Ω system):	<-80dBm
Operate Time:	7ms
Release Time:	6ms
Expected Life (Low power):	>1x10^8 ops
Expected Life (Full power):	>5x10^6 ops

† All the above specifications are for a complete 20-610 system consisting of eight multiplexers.
†† A lower thermal emf version is available to order (typically 10µV).

Multiplexer Operating Configurations

The 20-610-022 very high density multiplexer operates in all of the following modes (these are configurable via internal links):-

Quad	88-Channel 44-Channel	1-Pole Switching 2-Pole Switching
Dual	176-Channel 88-Channel 44-Channel	1-Pole Switching 2-Pole Switching 4-Pole Switching
Single	352-Channel 176-Channel 88-Channel 44-Channel	1-Pole Switching 2-Pole Switching 4-Pole Switching 8-Pole Switching

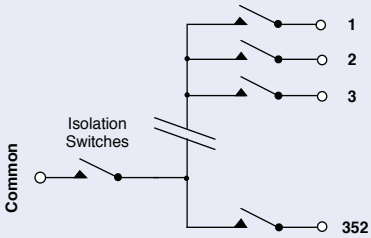
The 20-610-021 high density multiplexer operates in all of the following modes:-

Quad	44-Channel	1-Pole Switching
Dual	88-Channel 44-Channel	1-Pole Switching 2-Pole Switching
Single	176-Channel 88-Channel 44-Channel	1-Pole Switching 2-Pole Switching 4-Pole Switching

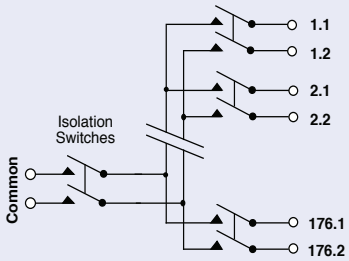
Analogue Common Connections:
Route Analogue Common to Front Panel
Route Analogue Common to Internal Analogue Buses

Expansion to multi case systems is achieved by choosing one module within each case and selecting the analogue bus to front panel configuration, the analogue bus commons are then simply daisy-chained to additional cases as required.

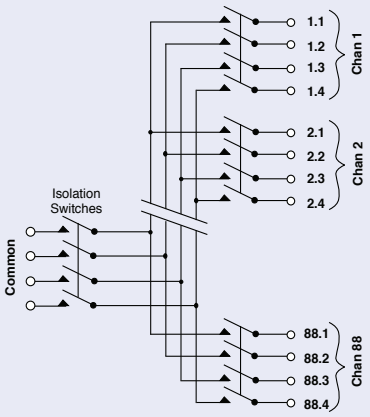
Multi channel selection: Care must be taken when selecting many channels simultaneously not to overrate the power supply. A 10-910 power supply will allow the simultaneous selection of up to 300 channels in a large multiplexer system.



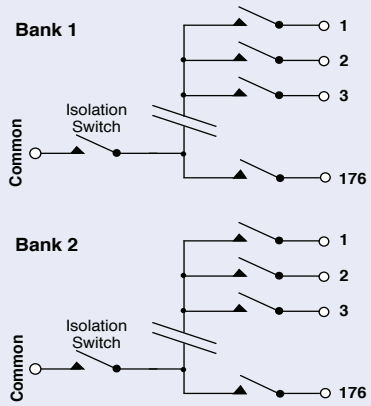
Single 352 Channel 1 Pole



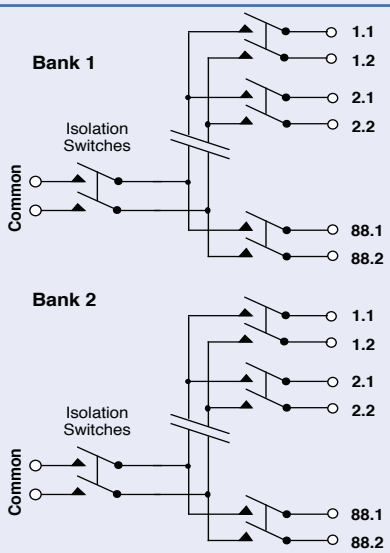
Single 176 Channel 2 Pole



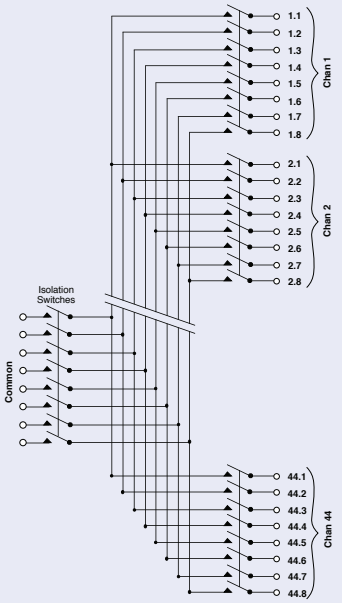
Single 88 Channel 4 Pole



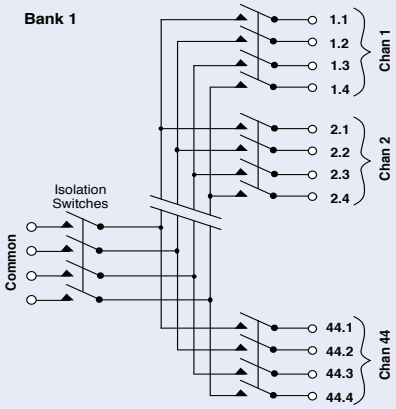
Dual 176 Channel 1-Pole

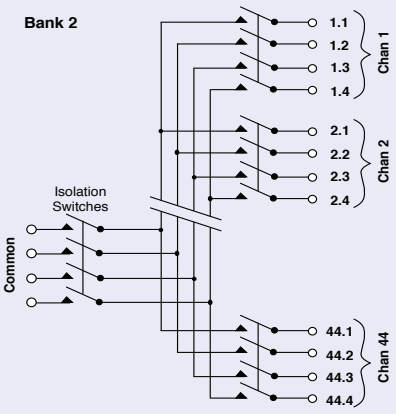


Dual 88 Channel 2-Pole

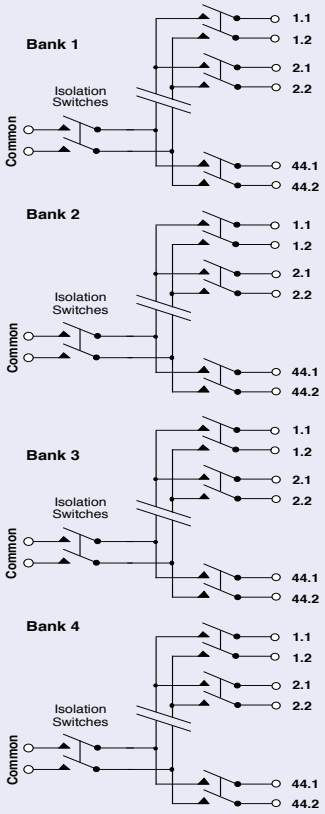


Single 44 Channel 8-Pole

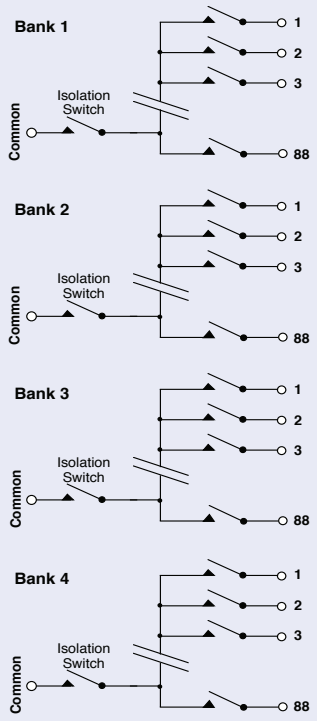




Dual 44 Channel 4-Pole



Quad 44 Channel 2-Pole



Quad 88 Channel 1-Pole

20-610-022 Very High Density Multiplexer Configurations

(20-610-021 High Density Multiplexers have exactly half the capacity of the above versions).

Analogue Bus

The analogue common can be routed (using internal jumpers) out to either the front panel connectors or the internal analogue bus. Routing to the front panel allows the user complete flexibility, routing to the internal analogue bus simplifies large system construction and ensures good signal isolation from external interference.

The System 10/20 backplane features a shielded 24 pole analogue bus. This would be used with a multiplexer constructed using more than one module where the selected channel will be carried along the System 20 backplane analogue bus.

The analogue bus can be brought out from the module in any of the following ways:-

1. The selected analogue common can be brought out on the front panel input connector. This also has the additional feature of keeping the analogue signal totally isolated from the backplane, improving crosstalk, dc leakage and low thermal emf performance.
2. Via a Breadboard module. Very useful if any signal conditioning, boosting etc. is to be done before bringing the signal out to the measuring device.

Built-In RS-232 Port

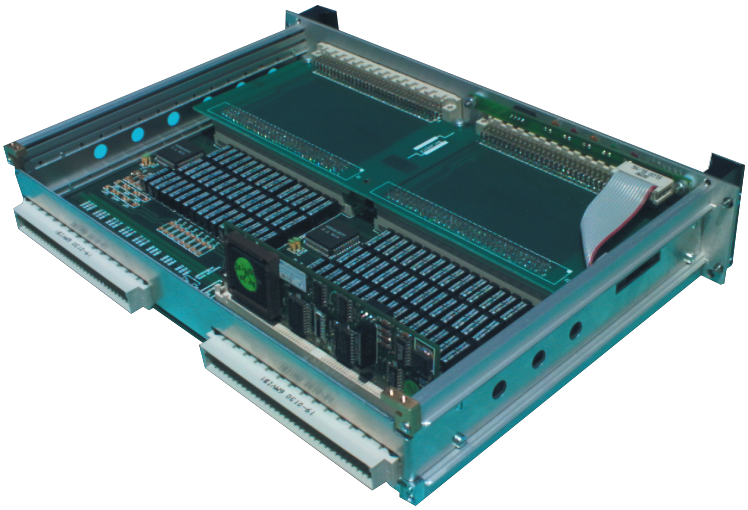
The 20-610 also has a built in RS-232 port (9600 baud, XON/XOFF, 8 bit, no parity). This is provided on a 4 pin Molex type connector on the front panel. A separate adapter lead to allow use with a standard 9 pin D-type is available. The RS-232 port allows the module to be configured, controlled and monitored from any RS-232 terminal. This can be thus used as a very versatile debugging aid.

Connectors - *suitable for ribbon cable connection*

Connection to the module front panel is via four 96 way DIN41612 connector plugs. Because of the large number of connections that may to be made to this module (up to 384) care must be take with user connections. IDC type DIN41612 connectors may be used. Other connector types may be available, please contact sales office for further information.

Width and Dimensions

All modules conform to the 6U height (262mm) Eurocard standard and are 160mm deep. Panel width is 1.8 Inches.



20-610 Shown WIth Cover Removed

Product Order Codes

352-Pin Multiplexer, Very High Density	**20-610-022**
176-Pin Multiplexer, High Density	**20-610-021**

Mating Connectors

96-way DIN 41612 Socket, Crimp Pin	**10-967-001**
96-way DIN 41612 Socket, IDC	**10-967-101**
96-way IDC Cable, 1m length (other lengths to order)	**10-967-201**

Latest Details

Please refer to our Web Site for Latest Product Details.
www.pickeringtest.com

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

Shipping Configurations

For example, to ship a 20-610-022 multiplexer set up as Single 352 Channel 1 Pole with the Analogue Common on the Front Panel Connector then order: "**20-610-022** Configuration **352/1/F**"

20-610-022 Very High Density Configurations

20-610-022 Multiplexer Mode	Number of Channels	Number of Poles	Front Analogue Bus	Rear Analogue Bus
Single MUX	352	1	**352/1/F**	**352/1/R**
Single MUX	176	2	**176/2/F**	**176/2/R**
Single MUX	88	4	**88/4/F**	**88/4/R**
Single MUX	44	8	**44/8/F**	**44/8/R**
Dual MUX	176	1	**176/1/F**	**176/1/R**
Dual MUX	88	2	**88/2/F**	**88/2/R**
Dual MUX	44	4	**44/4/F**	**44/4/R**
Quad MUX	88	1	**88/1/F**	**88/1/R**
Quad MUX	44	2	**44/2/F**	**44/2/R**

20-610-021 High Density Configurations

20-610-021 Multiplexer Mode	Number of Channels	Number of Poles	Front Analogue Bus	Rear Analogue Bus
Single MUX	176	1	**176/1/F**	**176/1/R**
Single MUX	88	2	**88/2/F**	**88/2/R**
Single MUX	44	4	**44/2/F**	**44/2/R**
Dual MUX	88	1	**88/2/F**	**88/1/R**
Dual MUX	44	2	**44/2/F**	**44/1/R**
Quad MUX	44	1	**44/2/F**	**44/1/R**

© Copyright (2006) Pickering Interfaces. All Rights Reserved
Pickering Interfaces maintains a commitment to continuous product development, consequently we reserve the right to vary from the description given in this data sheet.

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP