

- Low Cost High Density HV Multiplexer
- Switch up to 2kV with 3kV Isolation
- Configurable as either Dual 24 to 1 or Single 48 to 1 Multiplexer
- Automatic Isolation Switches Minimise Capacitive Loading and Leakage Current in Large Systems
- Any Combination of Channels may be Simultaneously Selected
- High Quality Reed Switch Contacts for Reliable Switching with Long Life
- Insulation Resistance > $10^{11}\Omega$



20-330 high voltage multiplexer modules will switch up to 2kV with 3kV isolation. They provide low cost, high voltage multiplexing with up to 192 channels per mainframe, expandable to over 1000.

Each module may be configured as either a single 48 channel or dual 24 channel multiplexer (see diagram). Programmable as a conventional break-before-make multiplexer or in multi-channel mode where any combination of channels may be selected at the same time, very useful in cable leakage testing applications.

These units are designed for both "hot" switching (close switch after load applied) and "cold" switching (close switch before EHT load applied) high voltage applications, giving very reliable switching with no disruption to internal logic. For large multiplexer systems automatic isolation switching connects only those multiplexer banks which contain active channels (see diagram), this maximizes performance in large multiplexer systems

Applications for the 20-330 series modules include: Transformer isolation testing, semiconductor breakdown, capacitor leakage, cable insulation testing and PTT approvals testing.

20-330 Multiplexer Module

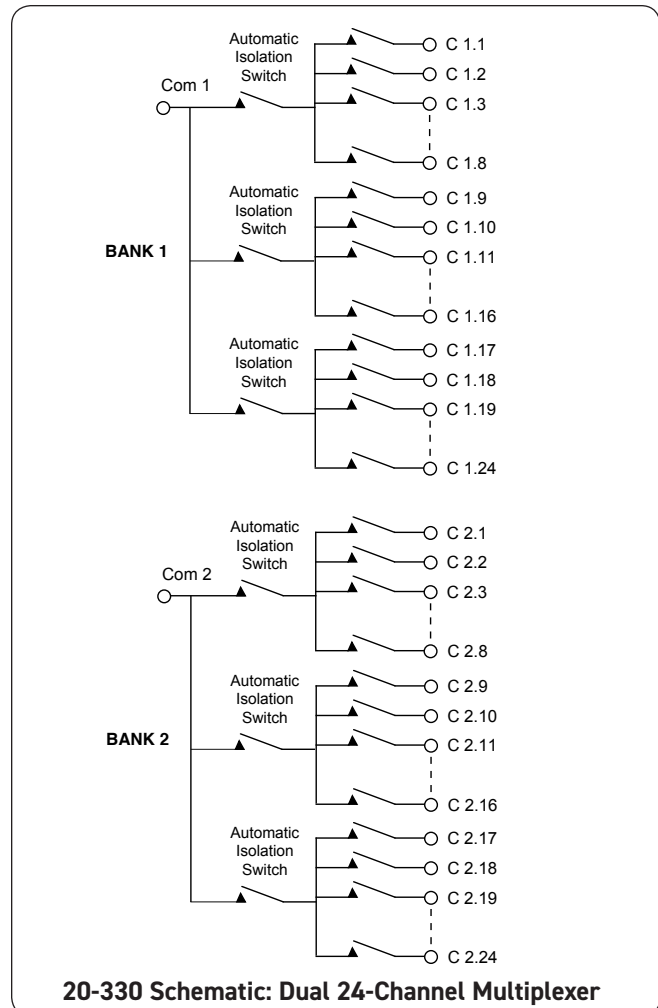
A dual 24 to 1 multiplexer giving maximum flexibility, it may be operated in any one of the following ways:-

- Dual 24 to 1 Multiplexer (Single Pole)
- Single 48 to 1 Multiplexer (Single Pole)
- Single 24 to 1 Multiplexer (Double Pole)

RFI Suppression

20-330 modules have extensive built-in RFI suppression, this will greatly increase switching life and eliminate potential problems due to high voltage transients upsetting either System 10/20 or more importantly your IEEE-488 Bus network. Please note, if possible keep high voltage switching modules away from more sensitive switching units to minimise any crosstalk.

To maximise system reliability and performance it is always preferable to "Cold Switch" high voltage signals.



20-330 Schematic: Dual 24-Channel Multiplexer

If your application requires **very low leakage currents** using a driven guard then please look at our 20-340 range with insulation resistance levels to over $10^{14}\Omega$.

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Very High Voltage Switching Specification

Version	20-330-011
Max Standoff Voltage:	3000V DC (3000V AC pk)
Max Switching Voltage:	2000V DC (2000V AC pk)
Max Power:	10W
Max Switch Current:	<2.5mA (at max voltage)
Max Current:	0.25A
Contact Resistance, On:	2Ω
Insulation Resistance, Off: †	>10 ¹¹ Ω (25°C 65%RH) >10 ¹⁰ Ω (40°C 95%RH)
Crosstalk:	
Channel to Channel at 10kHz	>100dB
Channel to Channel at 100kHz	>90dB
Capacitance:	
Selected Channel to Ground	<30pF
Bandwidth:	250kHz
Max Switch Operate Time:	10ms
Max Switch Release Time:	9ms
Expected Life Low power load:	>1x10 ⁸ operations
Expected Life Full power load:	>1x10 ⁶ operations

† Higher Insulation Resistance values may be possible.

Safety – Interlock Facility

All four high voltage connectors have an interlock facility, which can be used with external circuitry to disable any high voltage sources whenever any of the four connectors is not firmly secured.

High Voltage Connections

High voltage connections are made via four 15-pin high voltage connector plugs each with an earthed shield and including interlock pins.

Mechanical Characteristics

Modules conform to the 6U height (262mm) Eurocard standard and are 160mm deep, front panel width is 3.6 Inches. Up to four 20-330 modules will fit in a standard case, larger systems are built using expansion cases.

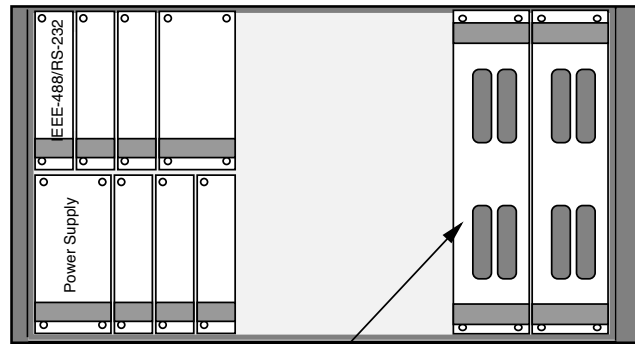
Operating/Storage Conditions

Operating Conditions

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

Storage and Transport Conditions

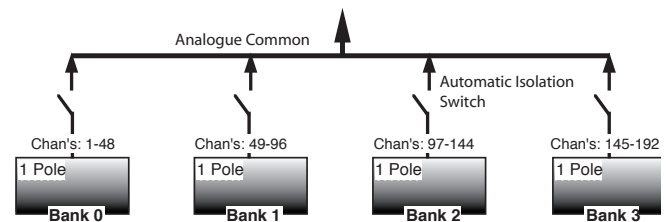
Storage Temperature:	-20°C to +75°C
Humidity:	Up to 95% non-condensing
Altitude:	15000m



Try To Keep High Voltage Modules Away From Sensitive Switching Modules

Creating Larger Multiplexers

When more than one module is used to make up a multiplexer – see diagram, where four modules are used to make up a 192 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.

The analogue common must be externally wired between modules (the built-in analogue buses are only suitable for signals < 100V).

Programming

The 20-330 high voltage multiplexer is simple to program:

ARESET a	Open all switches on module a .
CLOSE a,c	Select channel c on multiplexer a . Automatically clears previous channel (if set) before selecting new channel. When in dual 8 to 1 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. If s = 9 then all channels except c will be selected (useful for leakage testing applications).
DELAY t	Force a minimum delay of t milliseconds between two instructions.
RESET	Open all switches on all modules.
VIEW? a	View status of module a .

Product Order Codes

Dual 24-Channel HV MUX	20-330-011
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Further Information on High Voltage Switching

If you require more detailed information, please contact the Sales office for a free copy of the 20-330 Operating Manual. **High voltage switching can be a difficult area to work in, each application is different. If you require any further assistance please contact Pickering to discuss your requirement.**

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.

Support Products

Mating Connectors & Cabling

15-Pin High Voltage Socket	10-966-001
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Product Customization

Pickering System 20 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.