

- 10-330-001: 4 SPST Normally Open Reed Relays
- 10-330-101: 4 SPST Normally Closed Reed Relays – Useful For Safety Grounding
- Switch up to 3.5kVolts DC or 3.5kVolts AC Peak, 10W max power
- 5000V DC/AC Peak Isolation
- Front Panel Status LEDs



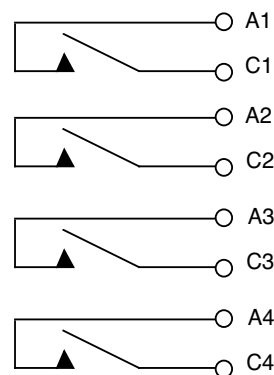
**\*Please contact Pickering for alternative PXI/LXI/USB solutions**

The 10-330 High Voltage Switching Modules will Switch up to 3500V with Isolation to 5000V. Two types are available: 4 x Normally Open Reed Relays and 4 x Normally Closed Reed Relays. The later will always be on in the event of power failure, important for safety grounding.

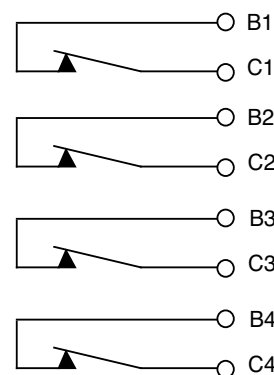
The 10-330 high voltage switching module provides the highest voltage capability within System 10. It has 4 x SPST Reed Relays with a choice of Normally Open (-001) or Normally Closed (-101) action. These units are designed for both “hot” switching (close switch after load applied) and “cold” switching (close switch before EHT load applied) high voltage applications, giving reliable switching with no disruption to internal logic.

Dry reed switches are used in both modules, these provide high reliability with very long life.

Applications for the 10-330 series modules include: transformer testing, circuit board isolation testing, capacitor leakage, relay testing, semiconductor breakdown monitoring and cable harness insulation testing.



**Model 10-330-001: 4 x SPST (Normally Open) High Voltage Reed Relays**



**Model 10-330-101: 4 x SPST (Normally Closed) High Voltage Reed Relays**

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## Relay Type

The module is fitted with High Voltage Reed Relays.

All reed relays are manufactured by our sister company Pickering Electronics: [pickeringrelay.com](http://pickeringrelay.com)

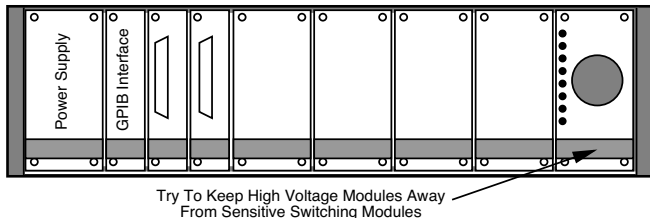
## Programming

The High Voltage Reed Relay module is simple to program either by single relay or by byte pattern (4 relays simultaneously):

<b>ARESET a</b>	Open all switches on module <b>a</b>
<b>CLOSE a,b</b>	Close switch number <b>b</b> on module <b>a</b>
<b>DELAY t</b>	Force a minimum delay of <b>t</b> milliseconds between two instructions
<b>OPEN a,b</b>	Open switch number <b>b</b> on module <b>a</b>
<b>RESET</b>	Open all switches on all modules
<b>VIEW? a[,b]</b>	View status of module <b>a</b> , can be viewed at any time either as a byte or by switch as a logical value (1 or 0)
<b>WRITE a,w</b>	Send word <b>w</b> to module <b>a</b>

## RFI Suppression

The 10-330 module has very extensive built-in RFI suppression, this will greatly increase switching life and eliminate potential problems due to high voltage transients upsetting either System 10 or more importantly your IEEE-488 Bus network. Please note, it is good practice to keep high voltage switching modules away from more sensitive switching units to minimise any crosstalk.



## Switching Specification

Relay Type:	High Voltage Reed
Max Standoff Voltage:	5000V DC 5000V AC peak
Max Switching Voltage:	3500V DC 3500V AC peak
Max Power:	10W (at max volts) 50W (at low volts)
Max Switch Current:	0.25A
Max Carry Current:	0.25A
Max Switch Current at Max Volts:	<5mA
Contact Resistance On:	3Ω
Contact Resistance Off:	>1x10 <sup>11</sup> Ω
Bandwidth:	250kHz
Max Switch Operate Time:	4ms
Max Switch Release Time:	4ms
Expected Life - low power load:	>1x10 <sup>8</sup> operations
Expected Life - Full power load:	>1x10 <sup>6</sup> operations

## Mechanical Characteristics

All modules conform to the 3U height (128mm) Eurocard standard and are 160mm deep. Front panel width is 2.4 inches.

## Connectors

Connections are made via a front panel mounted 15-pin high voltage male connector with one pin used for an earth shield and two more used for the safety interlock.

## 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

## 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.

## Product Order Codes

### 4 x SPST High Voltage Reed Relay Switching Module

Normally Open Dry Reed Switch	10-330-001
Normally Closed Dry Reed Switch	10-330-101

## Mating Connectors & Cabling

Mating High Voltage 15-Pin Socket	10-966-001
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## 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.

## Overview of “Hot” & “Cold” Switching Techniques

### “Hot” Switching

This is when the load is switched with the high voltage source applied. Hot switching may generate considerable RFI, both within the switching module and on interconnecting wiring. Care must be taken to suppress or shield all cabling.

Note that any precaution which adds extra capacitance to a cable should be taken with great care, even a very small capacitance at high voltages can cause very large inrush current through the module resulting in possible switch weld and excessive RFI.

10-330 Modules are fitted with suppression components to minimise high frequency switching noise, these

suppressors reduce the high energy, high frequency spikes present when “hot” switching high voltage signals.

### “Cold” Switching – The Preferred Option for Reliability & Long Life.

With cold switching the relay is operated before the high voltage source is connected, the maximum carry current is then much greater, there will also be much less stress on the reed switches resulting in improved reliability and life. There is also much less likelihood of generating RFI at switch time (provided the HT source has a soft start facility).

High voltage switching modules are often used for isolation testing applications (e.g. cable, transformer or semiconductor isolation tests) here cold switching is nearly always the preferred option.