GPIB High Voltage Reed Relay Module 20-350A

- Low Cost High Density HV Relays
- Switch up to 1.5kV with 2kV Isolation
- 32 x SPST Reed Relays
- Normally Closed Relay Option Available For Safety Applications
- High Quality Reed Switch Contacts for Reliable Switching with Long Life
- Insulation Resistance >$10^{12}\Omega$
- Indicator LED for Each Relay

The Model 20-350A High Voltage Relay module has 32 x SPST normally open high voltage reed relays switching up to 1.5kV with 2kV Isolation.

Model 20-350A provides low cost, high voltage switching with up to 256 switches per mainframe, expandable to over 1000.

20-350A modules 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. Each high voltage reed relay has suppression components mounted on either side of the switch, this greatly increases reliability and reduces switching noise.

On-Board High Voltage Wiring Positions

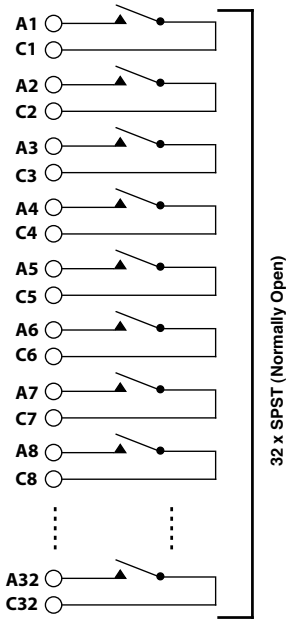
If a complex switching network is to be constructed using many interconnected high voltage relays, then this may be built within the switching module rather than in the external wiring - Refer to PCB schematic overleaf.

To simplify inter-relay wiring, interconnection points are built onto the circuit board, thus easing the construction of complicated wiring assemblies (this avoids the need for complex external interconnection looms).

RFI Suppression

20-350A 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.



Model 20-350A-001: 32 x Normally Open Relays

ISSUE 5.1 OCT 2018

Specification

Max Standoff Voltage:	2000V DC (2000V AC pk)
Max Switching Voltage:	1500V DC (1500V AC pk)
Max Power:	10W
Max Switch Current:	<5mA (at max voltage)
Max Carry Current:	0.5A
Contact Resistance, On:	<2Ω
Insulation Resistance, Off:	$>10^{12}$Ω (25°C 65%RH)
	$>10^{11}$Ω (40°C 95%RH)
Bandwidth:	250kHz
Operate Time:	<0.5ms, 0.25ms typ.
Release Time:	<0.5ms, 0.25ms typ.
Expected Life	
Low power load:	$>1x10^{8}$ operations
Full power load:	$>1x10^{6}$ operations

Safety – Interlock Facility

An **interlock** facility, which can be used with external circuitry to disable all high voltage relays is built into the module. A voltage >4V DC is required to enable relay operation, if this voltage is removed then **all relays will open**. A protected 5V source is provided to ease interlock implementation.

Indicator LEDs

All modules have LED indicators for each relay, thus easing system programming and debugging.

High Voltage Connections

High voltage connections are made via two front panel mounted 96-Pin ZIF connectors (to maximise the voltage isolation alternate contacts are used).

Mechanical Characteristics

Modules conform to the 6U height (262mm) Eurocard standard and are 160mm deep, front panel width is 2.4 Inches. Up to eight modules will fit in a standard case (256 relays), larger systems may be constructed using expansion cases.

Operating/Storage Conditions

Operating Conditions

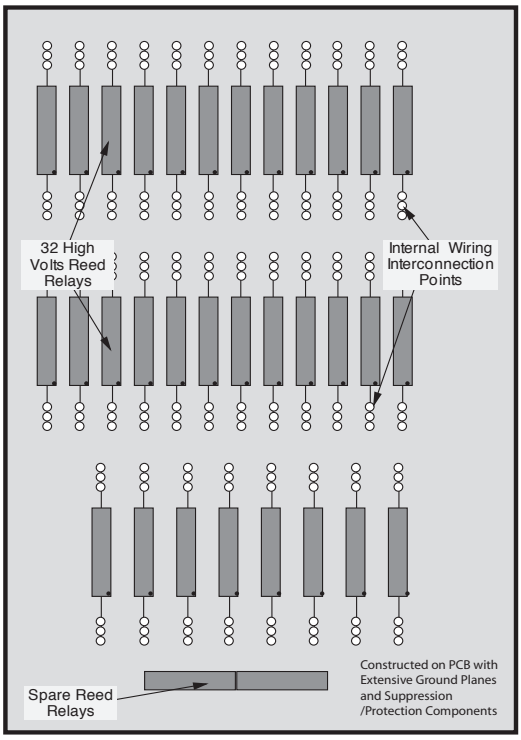
Operating Temperature:	0°C to +55°C
Humidity:	Up to 95% non-condensing
Altitude:	5000m

Storage and Transport Conditions

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

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.



20-350A-001 Internal PCB Layout

Programming

The 20-350A module is simple to program either by single bit or by byte (8 bits):

ARESET a	Clear all outputs on module **a**
CLOSE a,b	Set bit number **b** on module **a**
DELAY t	Force a minimum delay of **t** milliseconds between two instructions
OPEN a,b	Clear bit number **b** on module **a**
RESET	Clear all bits/switches on all modules
VIEW? a[,b]	View status of module **a**, can be viewed at any time either as a word or by bit **b** as a logical value (1 or 0)
WRITE a,w	Send byte **w** to module **a** (address **a** contains both the module address and the position of the byte being changed: 1 to 8 for a 64 relay unit).

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 Reed Relays** are built onto the module circuit board to facilitate easy maintenance with minimum downtime.

Product Order Codes

32 x SPST HV Relay Module	20-350A-001

urther Information on High Voltage Switching

If you require more detailed information, please contact the Sales office for a free copy of the 20-350A 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**.

Mating Connectors & Cabling

96-Pin ZIF Connector	10-964A-001
ZIF Connector Pins, 100 off	10-964A-801

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.