GPIB High Density Switching Matrix Module 20-519A

- High Density Matrix Module
- 40 x 4 Matrix Format with 1 or 2 Pole Switching
- Modules Expandable to Any Size Using Internal 24 Pole Analogue Bus
- Automatic Isolation Switching for Maximized Performance
- Built-In Switch Self Test with Fault Diagnosis to Component Level
- Switch up to 100 Volts DC, 0.5 Amps (1.2A carry), 20W Max Power
- Ruthenium Reed Relays For Maximum Switching Performance

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

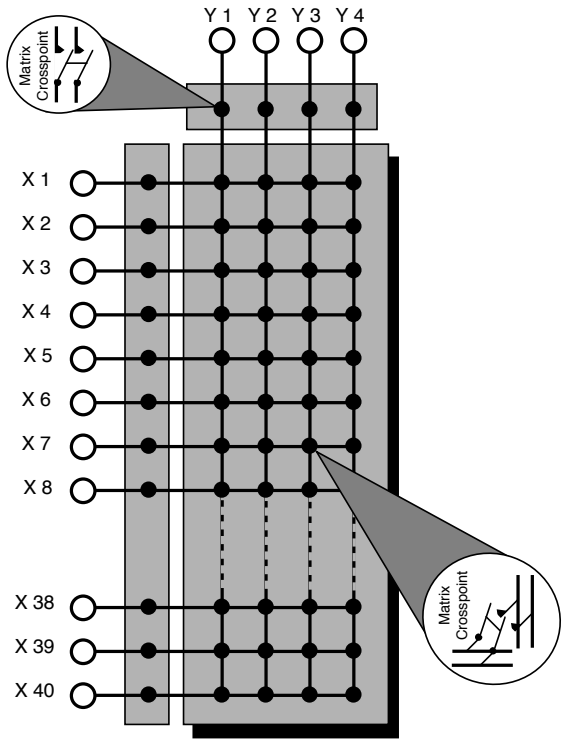
The 20-519A series of 40 x 4 matrix modules are available with either 1 or 2 pole switching. Built-in features include automatic isolation switching, plug-in expansion using internal analogue bus and relay contact self-test to give complete switching confidence.

This matrix module with it's "long and narrow" 40 x 4 configuration is designed for easy construction of small to medium sized matrix switching systems. Typically for use in small ATE systems where up to four source or sense instruments need to be connected to a device-under-test or bed of nails. Modules may be easily expanded to form matrices of almost any size, e.g. 80 x 4, 120 x 4,.. 320 x 4,.. etc.

Connections are made via front panel mounted connectors. Larger matrices may be constructed using the internal analogue bus. **Isolation Switches** on each module remove all unused columns and rows from the system, hence keeping interconnection capacitance and leakage to an absolute minimum.

Automatic Self-Test

Full Self-Test is performed at power up and at any other time either manually or under program control. **Self-Test** is of particular importance in large systems where relay contact integrity is a very major consideration. In the unlikely event of relay failure (either high on-state or low off-state resistance) the front panel will indicate a fault. The diagnosis - including the position of the suspect relay - will be indicated using the **`DIAGNOSTIC?`** command.



Switching Diagram for the 40 x 4 Matrix Module, Available With 1 or 2 Pole Switching

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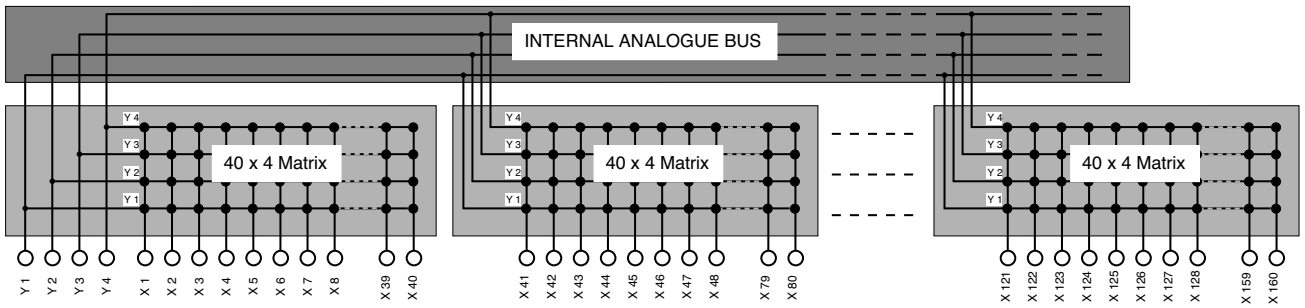

Expansion Using the Internal Analogue Bus: 160 x 4 Matrix Constructed Using 4 x 20-519A Modules

Reed Switch Type

Ruthenium Electro-Plated Reed Relays offer maximum performance, they are hermetically sealed and offer a very stable, long life relay contact (over 10^8 operations) with fast operate time. Alternative types such as electro-mechanical armature relays are lower cost but do not offer the consistent contact resistance, long life, fast switching speed and low level switching capability of a Ruthenium reed relay.

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

Switching Specification

Max Voltage:	100V DC
Max Power:	20W
Max Switch Current:	0.5A
Max Carry Current:	1.2A
On Path Resistance:	<500mΩ
Off Path Resistance:	>10^8Ω
Differential Thermal Offset:	<20µV
Capacitance	
Open Channel to Ground:	<50pF
Selected Channel to Ground:	<85pF
Open Input to Ground:	<4pF
Bandwidth:	4MHz
Isolation (at 1MHz):	>55dB
Crosstalk (at 1MHz):	>55dB
Switching Time:	15ms
Expected Life (Low power):	>1x10^8 operations
Expected Life (Full power):	>5x10^6 operations

Connectors

Matrix connection is via two high quality 96-Pin Rectangular Multipole Connectors (ZIF type).

Mechanical Characteristics

All 20-519A model versions are housed in a shielded 6U height (262mm) Eurocard module and are 160mm deep. Panel width for all versions is 1.8 Inches.

Programming

The matrix module is very easy to program using the Intelligent IEEE-488.2/RS-232-C Interface:

`ARESET a`	Open all switches on device **`a`**
`DIAGNOSTIC?`	Report any Self Test errors
`DELAY t`	Force a minimum delay of **`t`** milliseconds between two instructions
`MCLOSE a,x,y`	Close switch at coordinates **`x,y`** on matrix **`a`**
`MOPEN a,x,y`	Open switch at coordinates **`x,y`** on matrix **`a`**
`RESET`	Open all switches on all modules
`VIEW? a`	View status of device **`a`**

Self Test Details

Self-Test is invoked at power on (taking up to 60 seconds) and may also be operated under software (**`*TST?`**) or via a recessed push button. Self-Test pass is indicated on a front panel LED with a full pass/fail description available using the **`DIAGNOSTIC?`** command. Self-Test comprises 3 levels:

1. **Logic Test**
2. **Relay Coil Test**
3. **Full Contact Test**

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

40x4 Matrix, Ruthenium Reed, 1-Pole	20-519A-021
40x4 Matrix, Ruthenium Reed, 2-Pole	20-519A-022

Limiting Resistors

Built in limiting resistors on each row and column may be fitted, useful in preventing high current inrushes which may damage the reed switch. Please specify option **-R**.

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.