GPIB Very High Density Switching Matrix 20-534A/535A

- Very High Density Matrix Modules
- 32 x 8 Single Or Double Pole Matrix Format
- 64 x 4 Single Or Double Pole Matrix Format
- Modules Cascadable 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 highest density System 20 double pole matrices currently available from Pickering Interfaces. The 20-534A range of 64 x 4 and 20-535A range of 32 x 8 matrix modules include automatic isolation switching, plug-in expansion and built-in self-test to give complete switching confidence.

Models 20-534A (64x4) and 20-535A (32x8) now give the highest density 1 or 2 pole matrices available in any Pickering Interfaces System 20 switching module. They are intended for easy construction and use of large matrix systems; modules may be easily expanded to form matrices of almost any size, e.g. 64 x 4, 128 x 4, 256 x 8 ....512 x 16 using model 20-534; and 32 x 8, 64 x 8, 128 x 16....256 x 32 using model 20-535A.

Main applications are for signal routing in ATE systems: between the device under test and the measurement and stimulus instruments.

Connections are made via front panel mounted connectors. Larger matrices may be constructed using the internal 24 pole analogue bus.

Isolation Switches on each module remove all unused columns and rows from the system, hence keeping interconnection capacitance, leakage and crosstalk to an absolute minimum.

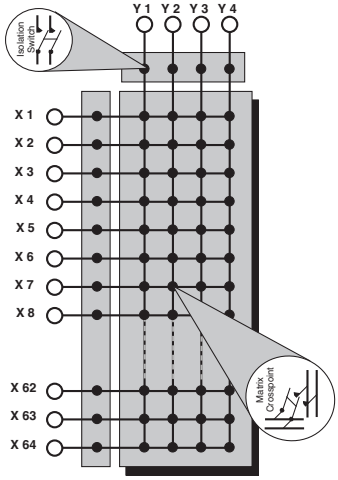
Creating Larger Matrices - Easily!

Each System 20 interface can directly support matrices with over 10 000 crosspoints. Larger sizes are supported using multiple System 20 interface modules. Large matrices are constructed by interconnecting two or more matrix modules. All such matrix modules must have the same primary address. Their position within the matrix is determined by their bank address, this is set on an additional 5 way dip switch.

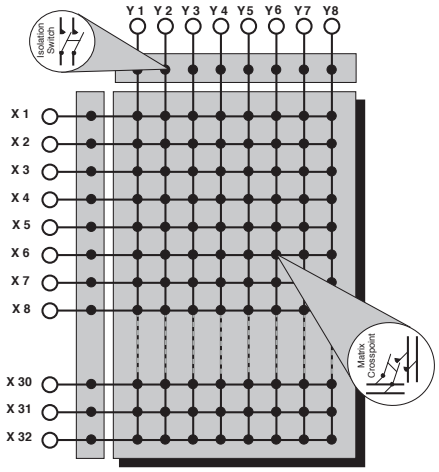
Both the X and Y axes have **on-board automatic isolation switches**. In large matrix systems the parasitic capacitance and leakage associated with each crosspoint switch can result in a significant degradation if several matrix modules are interconnected. The isolation switches connect only those columns and rows on a module that contain an active relay. Thereby keeping matrix capacitance to a minimum. These isolation switches are also used to remove the matrix from the external circuit when performing self-test.

A **shielded 24 pole analogue bus** is provided on the System 20 Analogue Backplane so constructing large matrices is very straight forward, no time consuming daisy-chained wiring harnesses etc.

Pickering can build large Matrix systems constructed and tested to your exact requirements, please contact sales office for further details.



Switching Diagram for the 20-534A 64 x 4 Matrix, Available as Single or Double Pole



Switching Diagram for the 20-535A 32 x 8 Matrix, Available as Single or Double Pole

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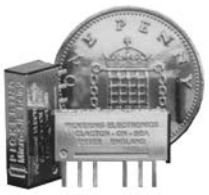
Reed Switch Type

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

20-534A/535A matrix modules are constructed using 400 Series 109 Reed Relays manufactured by our sister company Pickering Electronics Ltd. These are the smallest double pole reed relays currently available (the picture shows two 109-2-A-12/2D reed relays together with a British 1 pence coin, shown actual size).



Specification

Switch Type:	Ruthenium Reed
Max Voltage:	100V DC
Max Power:	20W
Max Switch Current:	0.5A
Max Carry Current:	1.2A
On Path Resistance:	<500mΩ
Off Path Resistance:	$>10^8$Ω
Differential Thermal Offset:	<20µV
Capacitance	
Open Channel to Ground:	<60pF
Selected Channel to Ground:	<100pF
Open Input to Output:	<4pF
Bandwidth:	5MHz
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

Mixed Matrix/Multiplexers Configurations

For some users requiring very large matrix systems the cost of a "full" matrix may prove prohibitive, in many instances a combination of multiplexer input/output and partially filled matrix may prove quite acceptable and could prove to be more effective in terms of both cost and performance. Please contact Pickering to discuss your application in detail.

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`**

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 exact fault description is available via the IEEE-488/RS-232 bus.

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**

Mechanical Characteristics & Connectors

All 20-534A/535A 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.

The connector type used is 2 x 96-Pin Rectangular (ZIF type). Other connector types are available e.g. BNC, Cannon, please contact factory for details.

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

Product Order Codes

64x4 Matrix, Ruthenium Reed, 1-Pole	20-534A-021
64x4 Matrix, Ruthenium Reed, 2-Pole	20-534A-022
32x8 Matrix, Ruthenium Reed, 1-Pole	20-535A-121
32x8 Matrix, Ruthenium Reed, 2-Pole	20-535A-122

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**.

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.

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.