

- 20 x 4 Matrix Formats with 1 or 2 Pole Switching
- Modules Cascadable to Any Size Using Internal 24-Pole Analogue Bus
- Automatic Isolation Switching
- Built-In Switch Self Test
- Switch up to 100 Volts DC, 0.5 Amps (1.2A carry), 20W Max Power
- Ruthenium Reed Relays For Maximum Switching Performance

Modules 20-518A are matrix modules arranged in a 20 x 4 configuration with either 1 or 2 pole switching. Intended for easy construction of small to medium sized matrix switching systems.

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, via a front panel switch 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.

Creating Larger Matrices - Easily!

Each System 20 interface can directly support matrices with over 5000 crosspoints. Larger sizes are supported using multiple System 20 interface modules.

Very 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.

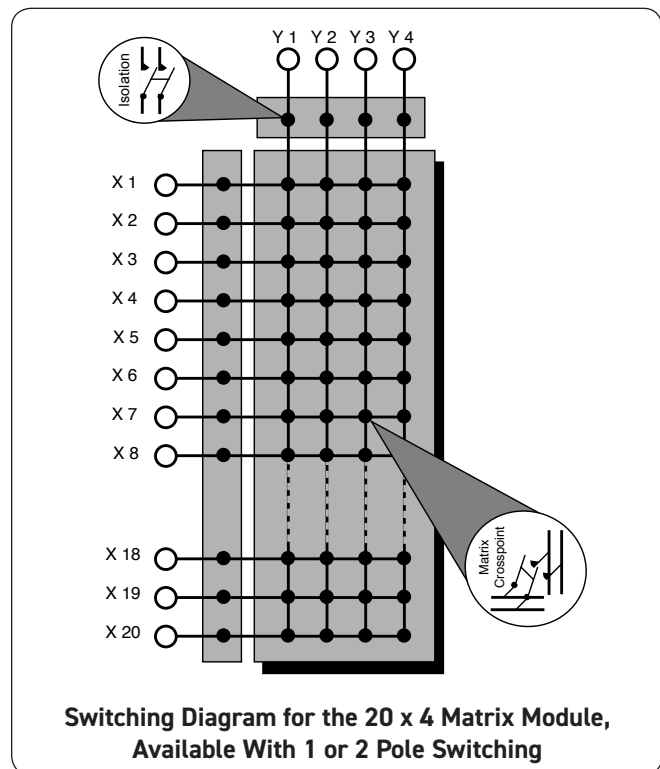
Both the X and Y axes have **on-board automatic isolation switches**. In large matrix systems the parasitic capacitance and leakage associated with each crosspoint switch can result in a significant degradation if several matrix modules are interconnected. The isolation switches only switch in those columns and rows on a module that contain an active switch. 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.



Not Recommended for New Designs*

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



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 the sales office for further details.

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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

Switching Specification

Max Voltage:	100V DC
Max Power:	20W
Max Switch Current:	0.5A
Max Carry Current:	1.2A
On Path Resistance:	<500m Ω
Off Path Resistance:	>10 $^8\Omega$
Differential Thermal Offset:	<20 μ V
Capacitance	
Open Channel to Ground:	<40pF
Selected Channel to Ground:	<70pF
Open Input to Ground:	<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

Connectors

Matrix connection is via a high quality 96-Pin Rectangular Multipole Connector (ZIF type), this is pin compatible with appropriate modules in the 20-510A & 20-515A range.

Mechanical Characteristics

All 20-518A 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 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

Further matrix control may be achieved using the IEEE-488.2 stored settings commands (***SAV/*RCL**), these permit the storage and later recall of complex matrix configurations.

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

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.

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

20x4 Matrix, Ruthenium Reed, 1-Pole	20-518A-021
20x4 Matrix, Ruthenium Reed, 2-Pole	20-518A-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.