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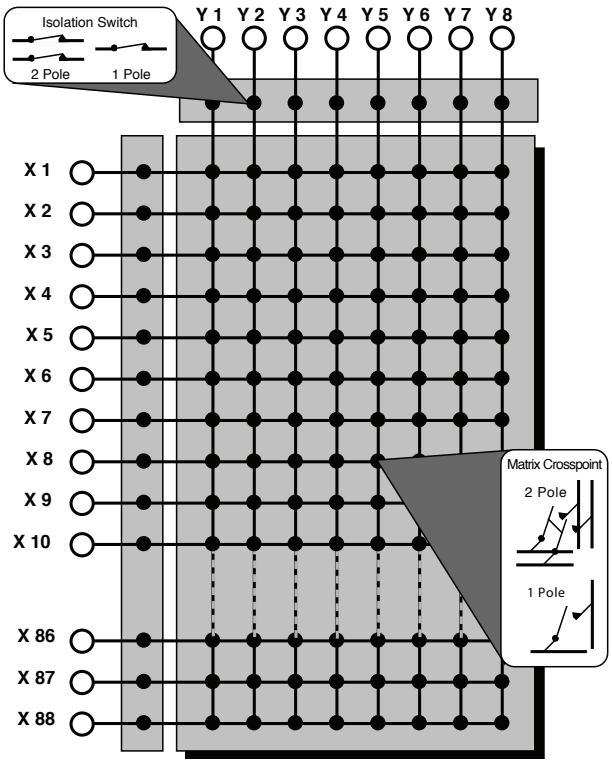
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Find the *Pickering 30-510-022* at our website: ***Click HERE***

30-510A
88 x 8 High Density Matrix



- Very High Density Matrix Modules
- 88 x 8 Matrix Format
- Available in Partially Populated Versions, Minimising Cost But Allowing For Easy Future Expansion
- Choice of 1 Pole, 2 Pole and 1 Pole Screened Configurations
- Single Slot C Sized VXI Message Based Module
- High Quality Ruthenium Reed Relays
- Automatic Isolation Switching for Maximised Performance
- Switch up to 100Volts dc, 1Amps (1.2A carry), 10W Max Power
- Built-In Fixtureless Relay Self Test with Fault Diagnosis to Component Level with Service Indicator
- SCPI Software Commands
- SCPI Control Via The Built-In RS-232 Interface Allows Easy Manual Control and Monitoring
- IVI & VXI Plug and Play Drivers



Schematic Diagram of Fully Loaded 88 x 8 Matrix
(1 Pole, 2 Pole or 1 Pole Screened Versions Available)

The 30-510A high density matrix from Pickering Interfaces is available in sizes up to 88 x 8 (704 crosspoints) with a choice of 1 pole, 2 pole or 1 pole screened switching. In a standard VXI chassis it is expandable up to, for instance, 1056 x 8 (8448 crosspoints). The 30-510A features built-in self-test to give complete switching confidence with early failure warning.

The 30-510A may be ordered in any size up to the maximum of 88 x 8, for example 40 x 6, 60 x 5, etc.., this allows the user to chose the optimum matrix size without incurring unnecessary cost.

Connections are made via front panel mounted connectors. Larger matrices may be constructed by daisy chaining signals between cards. 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.

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

Software Support

The SCPI command set is fully implemented and the 30-510A is supplied with IVI & VXI plug and play drivers (available direct from our web site, www.pickeringtest.com).

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Self Test

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. To assist in the early detection of failed relays, all switch contacts are automatically checked against an internal calibrated standard (one for each of the 704 switch paths), as soon as the switch contact starts to deteriorate (but before failure) a service LED indicator will be activated.

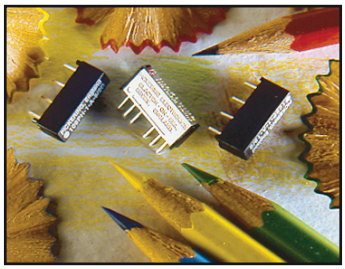
Matrix Operation

The 30-510A is a true 88 x 8 high density matrix, any combination of crosspoints may be selected.

Pickering Electronics State-Of-The-Art Reed Relays

VXI matrix modules are constructed using up to 1000 x Series 109 Reed Relays manufactured by our sister company Pickering Electronics. These are the smallest double pole reed relays available.

Sputtered Ruthenium Reed Relays offer maximum performance, they are hermetically sealed and offer a very stable, long life relay contact (>10^8 operations, typically 10^9 operations) with very fast operate time. Alternative types such as electro-mechanical armature relays or non-instrumentation grade reed relays are lower cost but do not offer the consistent contact resistance, long life, fast switching speed and low level switching capability of a reed relay.



All of the reed relays used in our matrix switching cards are manufactured by Pickering Electronics, these offer maximum switching performance. Please visit the Reed Relay web site at www.pickeringrelay.com for further information.

Width, Dimensions and Weight

The 30-510A is housed in a C Sized VXI module and occupies 1 slot (30mm). Weight is < 2000g.

VXI Module Construction

The module is constructed in accordance with the VXI specification, revision 1.4.

The 30-510A has a standard IEEE-488.2 message based VXI interface and is constructed using an 8 layer PCB with extensive RFI shielding. The microcontroller and VXI interface are contained on a small “piggyback” daughter PCB. Most components are surface mount types, however to simplify maintenance all relays are leaded.

Microcontroller Based Design

The 30-510A matrix has a built in 32 bit microcontroller, Motorola 68332. The operation of this module is controlled entirely by this microcontroller.

The flash memory based microcontroller allows modifications to the matrix instruction set or self test operation to be implemented by simply downloading new firmware from disc or from the Pickering Internet Web site. Parametric data is also stored in nonvolatile flash memory.

General Switching Specification

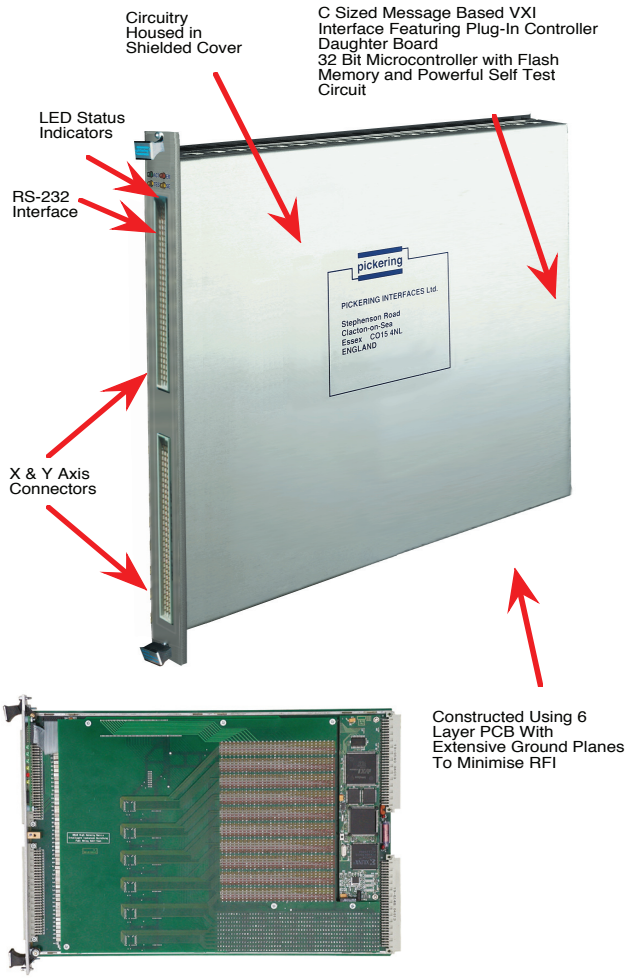
Maximum Voltage:	100V d.c.
Maximum Power:	10W
Maximum Switch Current:	1A
Maximum Carry Current:	1.2A
On Path Resistance:	<1.1Ω
Off Path Resistance:	>$1x10^8$Ω
Differential Thermal Offset:	<30µV
Capacitance, Open Channel to Ground:	<60pF
Capacitance, Selected Channel to Gnd:	<100pF
Capacitance, Open Input to Output:	<4pF
Bandwidth:	5MHz
Isolation (at 1MHz):	>55dB
Crosstalk (at 1MHz):	>55dB
Expected Life (Low power):	>$1x10^8$ ops
Expected Life (Max power):	>$5x10^6$ ops
Switching Time (1 crosspoint):	<3.5ms
Switching Time (data block):	<5.0ms
Switching Time (*RCL):	<3.0ms

Power Supply Specification

5V d.c.	<0.5A
12V d.c.	<0.7A (< 20 crosspoints selected)
Total Power:	<11W (< 20 crosspoints selected)
Power Up Delay:	<15s (required for selftest)

Environmental Specification

Operating Temperature:	0° to 45°C
Storage Temperature:	-20° to +75°C
Humidity:	95% Non Condensing
Cooling Requirements:	Forced ventilation advised

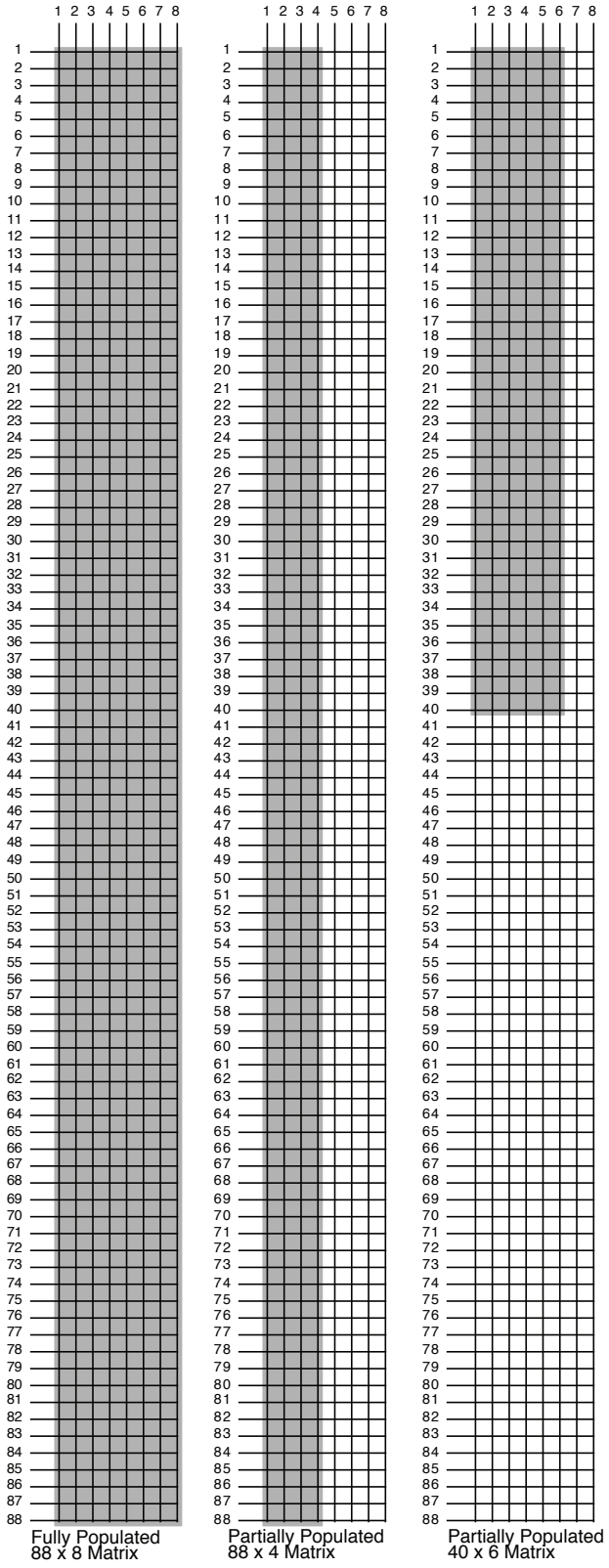


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Ordering Specific Configurations

The 30-510A may be ordered with a specific configuration. Some examples are shown below. Basically, the card can be factory populated as required, future updates to increase capacity can be added at any time in the future (on a return to factory basis).

The illustration shows (1) A fully populated 88 x 8 matrix, (2) A partially populated 88 x 4 matrix and (3) A partially populated 40 x 6 matrix.



Automatic Self Test

Self-Test is invoked at power on (taking around 4 seconds) and may also be operated under software command (from the VXI or RS-232 ports). Self-Test pass is indicated on a front panel LED with a full pass/fail description available using the DIAGnostic? command. Self-Test comprises 5 levels (shown in the flow chart below):-

1. **Power Supply, Logic and Temperature Test**
2. **Relay Coil Test**
3. **Full Contact Test**
4. **Contact Test For Relays Entering End Of Life**
5. **External Fixtured Self Test (this check requires a plug-on self test adapter)**

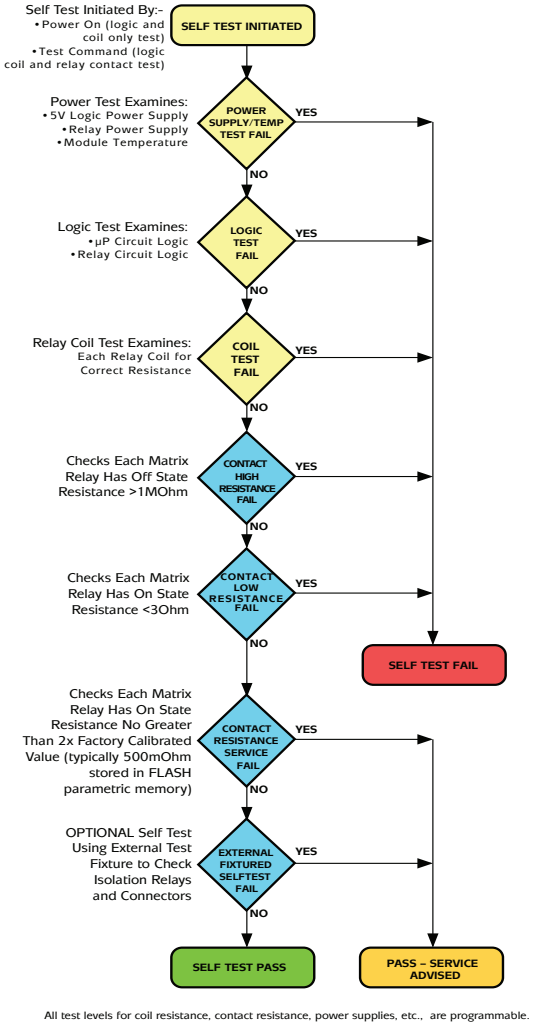
Power up self test includes just items 1 and 2. Full self test (run from software command) includes items 1,2 ,3 and 4.

Self test is undertaken *without* removing test fixtures (except for test 5), built in isolation switches first disconnect the core matrix from the external fixture before the test commences (to maximise reliability these isolation switches always “cold switch”).

All relay service and fail test thresholds are re-programmable also complete relay self test data together with detailed diagnostics may be dumped via the RS-232 port.

Built-In Spare Relays

Spare relays are mounted within the module, so should self test indicate a suspect relay then repair will only take a few minutes, thus keeping downtime to an absolute minimum.



All test levels for coil resistance, contact resistance, power supplies, etc., are programmable.

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LED Indicators

There are six indicators:-

POW Power indicator. Colour Green.

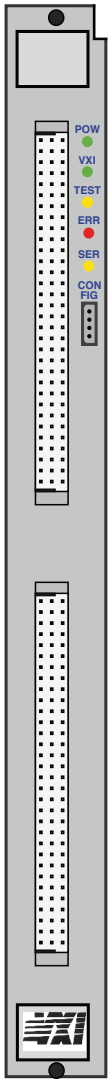
VXI Indicates if module has VXI interface. Colour Green.

ACT Matrix active indicator, set if any crosspoint is selected. Colour Green.

ERR Error found during self test. Colour Red.

TEST Self Test running indicator. Colour Yellow.

WARN Module requires maintenance. A relay has been diagnosed as entering failure conditions. Colour Yellow.



DIP Switches

The 30-510A has a DIP switch, SW1 for VXI addressing.

The built in RS-232 port is used for additional configurations and self test options.

IVI & VXI Plug and Play

All Pickering Interfaces VXI modules are IVI & VXI Plug and Play compliant. Latest drivers are at www.pickeringtest.com

Programming

The 30-510A Matrix module is very easy to program. All commands are in IEEE-488.2 format, the main examples are shown below (a separate Programming Manual will be available):-

Device Specific Commands

:SERVice?
:TYPE?

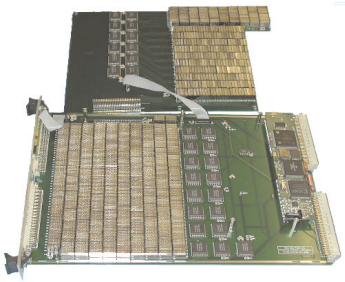
488.2 Common Commands

*CLS	*ESE <INT_P>	*ESE?
*ESR?	*IDN?	*OPC
*OPC?	*RCL r	*RST
*SRE <INT_P>	*SRE?	*SAV r
*STB?	*TST?	*WAI

SCPI Commands

:STATus
  :OPERation
    [:EVENt]?
      :CONDition?
      :ENABle <INT_P>
      :ENABle?
  :QUEStionable
    [:EVENt]?
      :CONDition?
      :ENABle <INT_P>
      :ENABle?
  :PRESet

:SYSTem
  :ERRor[:NEXT]?
  :VERSion?
  :CAPability?
:[ROUTe]
  :CLOSe <channel_list>
    :STATe?
  :OPEN <channel_list>
    :ALL
:DIAGnostic?



Notes

SCPI version conformance is 1996.0. Nodes in [] are optional.

Parameter types

<INT_P>::	<Rounded NRf>
<INT_VAL>::	<Rounded NRf> | MIN | MAX | DEF
<NRf>::	IEEE 488.2 'flexible' syntax for NR1,NR2, & NR3
<Rounded NRf>::	Number will be rounded to an integer if parameter requires integer
<channel_list>::	IEEE488.2 channel list

VXI Programming Examples

`TYPE?`	Description of matrix.
`CLOS (@1(2!3))`	Close bank 1 crosspoint y=2,x=3.
`CLOS (@1(1!2,3!4))`	Close bank 1 crosspoints y=1,x=2 & y=3,x=4.
`CLOS (@2(5!7:6!8))`	Close range of crosspoints, bank 2: y=5,x=7, y=5,x=8, y=6,x=7, y=6,x=8.
`OPEN (@1(2!3))`	Open bank 1 crosspoint y=2,x=3.
`OPEN:ALL`	Open all crosspoints.

RS-232 Programming Commands

The 30-510A also has a built in RS-232 port (9600/19200/57600 baud, XON/XOFF, 8 bit, no parity). This is provided on a 4 pin Molex type connector. A separate adapter lead to allow use with a standard 9 pin D-type is available.

The RS-232 port allows the matrix to be controlled and monitored from any RS-232 terminal. This can be used as a very versatile debugging aid.

The RS-232 port supports full SCPI operation. Therefore the RS-232 port can be used for familiarization and debugging of your VXI program code.

Product Order Codes

VXI 88 x 8 Matrix with Built In Relay Self Test	
88 x 8 Matrix, 1 Pole Switching	**30-510A-021-88x8**
88 x 8 Matrix, 2 Pole Switching	**30-510A-022-88x8**
88 x 8 Matrix, 1 Pole Screened	**30-510A-021-S-88x8**
VXI 88 x 8 Matrix, Self Test/Isolation Functions REMOVED	
88 x 8 Matrix, 1 Pole Switching	**30-510A-021-N-88x8**
88 x 8 Matrix, 2 Pole Switching	**30-510A-022-N-88x8**
88 x 8 Matrix, 1 Pole Screened	**30-510A-021-SN-88x8**
PC Adapter for RS-232 port (2m, 9 way D)	**30-952-020**
Mating Connectors (DIN 41612, 96 Way)	
Crimp pin version	**10-967-001**
IDC Socket	**10-967-101**
IDC Cable	**10-967-201**

Partially populated versions are available, please specify the X and Y size in the product code, for example 30-510A-021-1-40x4 (40 x 4 1 pole matrix).

Further options are available.

All VXI cards are supplied with a detailed manual and CD ROM containing datasheets for all Pickering Switching products, company information and software drivers.

Latest Details

Please refer to our Web Site for Latest Product Details.
www.pickeringtest.com

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