LXI Low Thermal EMF Matrix

60-510

- Single Pole 56x33 Matrix
- Low Thermal Offset
- Excellent Low Level Switching Characteristics
- Switch up to 150 VDC/100 VAC with 10 W Max Power
- Maximum Carry Current of 1A
- 2U Rack Mountable Enclosure
- LXI Standard 1.4 Compliant

- IVI & Direct I/O Drivers
- Supported by ***eBIRST*** ™
- 3 Year Warranty

The 60-510 is a high density 1-pole 56x33 matrix controlled via LXI. It has excellent thermal stability and substantially reduced thermal EMF figures when compared to a conventional switching matrix.

Typical applications include signal routing in ATE, selecting thermocouple inputs, switching amplifier gain circuits and high accuracy DC microvolt measurements.

Ruthenium reed switches are used because of their good low level switching capability. They also have a very long life with excellent contact resistance stability and low thermal offset.

The 60-510 is designed in accordance with the LXI Standard 1.4 and is supplied in a 2U high, full rack width case with 500mm depth.

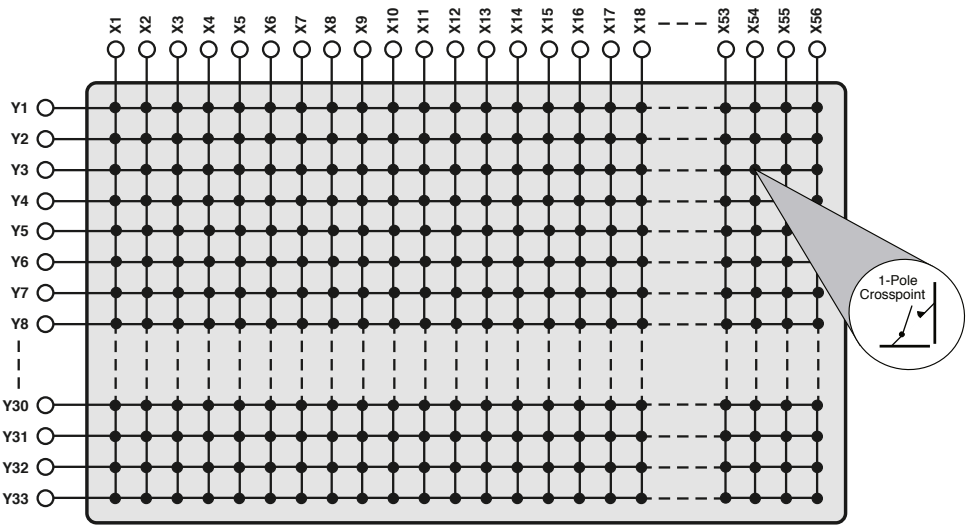
It is programmable via the LAN interface using Pickering Interfaces' generic switch driver. Industry standard (W3C) web browsers can be used to access and change configuration information and provide access to the soft front panels.

The 60-510 is ideal for applications where a simple start-up process is required and for applications requiring control over large distances.

Supported by *eBIRST*

eBIRST switching system test tools simplify switching system fault-finding by quickly testing the system and graphically identifying the faulty relay.

For more information go to: pickeringtest.com/ebirst



60-510 1-Pole 56x33 Low Thermal EMF Matrix Schematic Diagram

Relay Type

The 60-510 is fitted with low thermal Pickering reed relays (ruthenium sputtered type), these offer very long life with good low level switching performance and excellent contact resistance stability.

These relays are leaded types (not surface mount) so field maintenance is greatly simplified. Also a spare reed relay is built onto the matrix circuit boards to allow easy maintenance with minimum downtime (a fully populated 60-510 chassis has four matrix circuit boards).

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

Switching Specification

Switch Type:	Ruthenium Reed
Max Standoff Voltage:	150 VDC/100 VAC*
Max Power:	10 W
Max Switch Current:	0.5 A
Max Carry Current:	1 A
Path Resistance, On:	<1.0 Ω
Path Resistance, Off:	$>10^9$ Ω
Operate Time:	<0.5 ms
Release Time:	<0.5 ms
Expected Life	
Low power load:	$>1x10^9$ operations
Full power load:	$>1x10^6$ operations

* For full voltage rating, signal sources to be switched must be fully isolated from mains supply and safety earth.

Thermal EMF Specification

	Relay Operated for <5 s	Maximum †
1-pole (single ended):	<2.5 µV typical	<5 µV typical

† Thermal emf increases with the time that the relay contacts remain closed, reaching a maximum after 20 minutes.

Power Source

Universal AC mains supply, 90 to 264 VAC 50-60 Hz	
Power Inlet:	Male IEC connector

LAN Interface

Compliant to LXI Standard 1.4, the 60-510 has a 1000Base-T Ethernet Interface via a standard RJ-45 connector mounted on the rear panel with an LCD display showing the unit's IP address.*

***Note:** Legacy units may not have 1000Base-T support or be fitted with an LCD display.

Mechanical Characteristics

Supplied configured ready for rack mounting.

Dimensions: 2U high, full rack width, 500 mm depth

3D models for all versions in a variety of popular file formats are available on request.

Connectors

Signals via front panel connectors:

X connections: 25-pin male D-type

Y connections: 37-pin male D-type

For pin outs please refer to the operating manual.

Operating/Storage Conditions

Operating Temperature:	0 °C to +55 °C
Humidity:	Up to 95% non-condensing
Altitude:	5000 m
Storage/Transport Temperature:	-20 °C to +75 °C
Humidity:	Up to 95% non-condensing
Altitude:	15000 m

Safety & CE Compliance

All products 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

1-Pole 56x33 Low Thermal EMF Matrix	60-510-001
1-Pole 42x33 Low Thermal EMF Matrix	60-510-002
1-Pole 28x33 Low Thermal EMF Matrix	60-510-003
1-Pole 14x33 Low Thermal EMF Matrix	60-510-004
1-Pole 44x33 Low Thermal EMF Matrix	60-510-021

Product Customization

Pickering LXI units 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 reed relay types
- Mixture of reed 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.

Support Products

eBIRST Switching System Test Tool

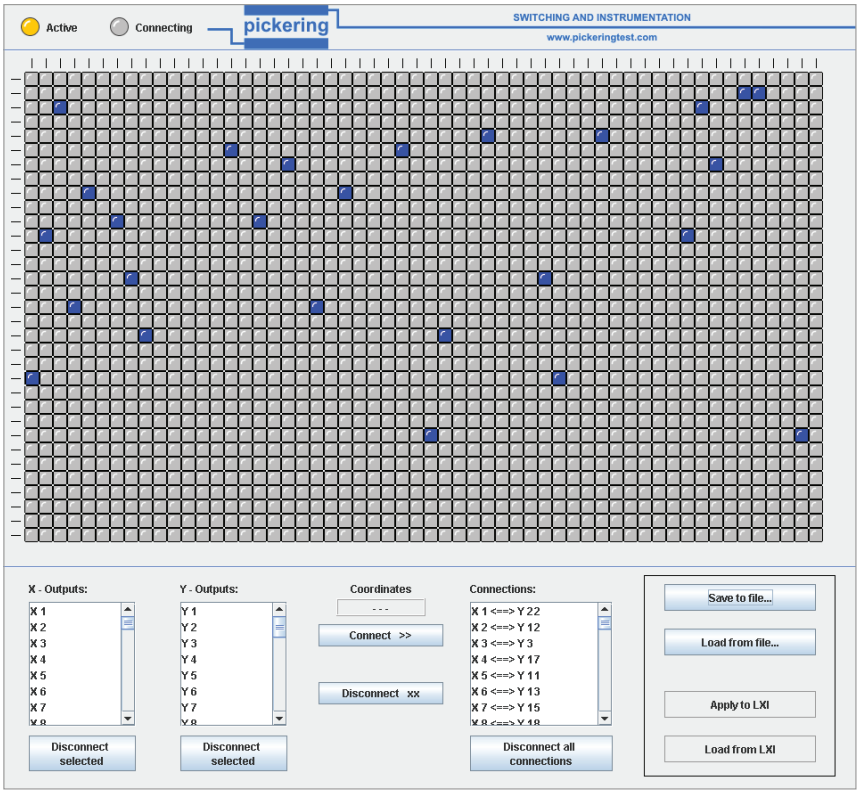
This product is supported by the eBIRST test tools which simplify the identification of failed relays, the required eBIRST tools are below. This product requires master slave testing and one set of each tool is required together with the master slave cable 93-970-301.

For more information go to: pickeringtest.com/ebirst

Connector	Test Tool	Adaptor
25-pin	93-005-001	93-005-414
37-pin	93-005-001	93-005-418

Mating Connectors & Cabling

For connection accessories for the 60-510 please refer to the 90-007D 37-pin D-type and 90-008D 25-pin D-type Connector Accessories data sheets where a complete list and documentation can be found for accessories, or refer to our website.



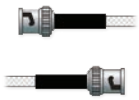
Soft Front Panel for the 60-510 LXI Low Thermal EMF Matrix

Connectivity Solutions

We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with **1200+** products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed to mechanically and electrically mate to our modules. These accessories are detailed in Connector Accessories data sheets, where a complete list and documentation can be found for each accessory.

Connectors & Backshells

Multi-way Cable Assemblies



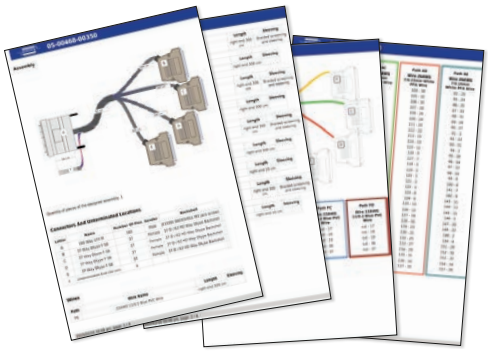
RF Cable Assemblies

Breakouts

Connector Blocks

We also offer customized cabling and have a free online **Cable Design Tool** that can be used to create custom cable solutions for many applications.

- Fully supported on modern browsers and tablet operating systems.
- Built-in tutorials and videos allow you to get quickly up to speed.
- Store cable assemblies in the Cloud and develop over time.
- Each cable design has a downloadable PDF documentation file detailing all specifications



Start designing your custom cabling, go to pickeringtest.com/cdt

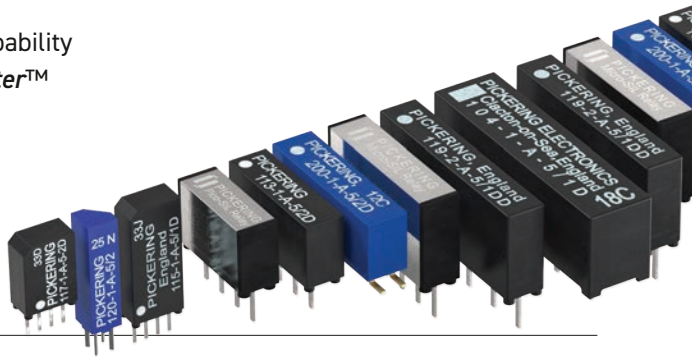
Mass Interconnect

We recommend the use of a mass interconnect solution when an Interchangeable Test Adapter (ITA) is required for PXI/LXI based test systems. Our modules are fully supported by Virginia Panel and MacPanel.

Pickering Reed Relays

We are the only switch provider with in-house reed relay manufacturing capability via our Relay Division. These instrument grade reed relays feature ***SoftCenter***™ technology, ensuring long service life and repeatable contact performance.

To learn more go to pickeringrelay.com



Programming

Pickering provide kernel, IVI and VISA (NI & Keysight) drivers which are compatible with all Microsoft supported versions of Windows and popular older versions.

For more information go to pickeringtest.com/os

The VISA driver support is provided for LabVIEW Real Time Operating Systems (Pharlap and Linux-RT). For other RTOS support contact Pickering. These drivers may be used with a variety of programming environments and applications including:

- **Pickering Interfaces Switch Path Manager**
- **National Instruments** products (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, VeriStand, etc.)
- **Microsoft Visual Studio** products (Visual Basic, Visual C++)
- **Programming Languages** C, C++, C#, Python
- **Keysight** VEE and OpenTAP
- **Mathworks MATLAB, Simulink**
- **Marvin** ATEasy
- **MTQ Testsolutions** Tecap Test & Measurement Suite

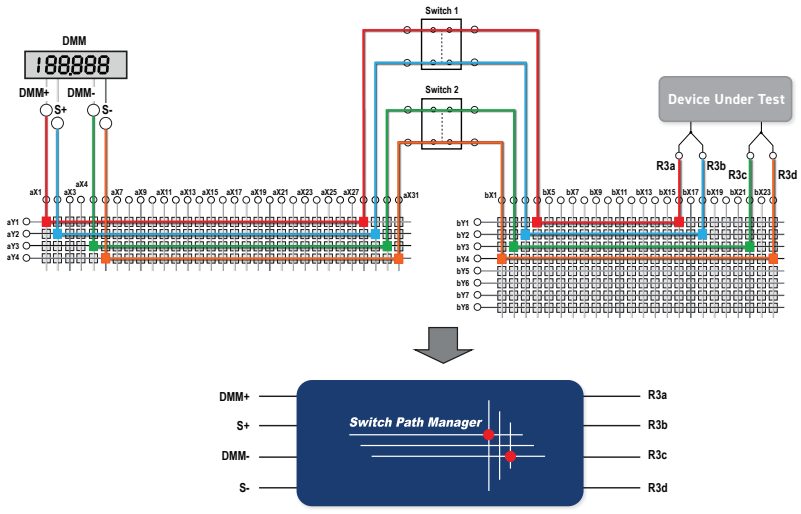
Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries. We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help you develop test routines with ease.

To learn more about software drivers and development environments go to pickeringtest.com/software

Signal Routing Software

Our signal routing software, Switch Path Manager, automatically selects and energizes switch paths through Pickering switching systems. Signal routing is performed by simply defining test system endpoints to be connected together, greatly accelerating Test System software development.

To learn more go to pickeringtest.com/spm



Diagnostic Relay Test Tools

eBIRST Switching System Test Tools are designed specifically for our PXI, PCI or LXI products, these tools simplify switching system fault-finding by quickly testing the system and graphically identifying the faulty relay.

To learn more go to pickeringtest.com/ebirst

Three Year Warranty & Guaranteed Long-Term Support

All standard products manufactured by Pickering Interfaces are warranted against defective materials and workmanship for three years from the date of delivery to the original purchaser. Extended warranty and service agreements are available with various levels for your requirements. Although we offer a 3-year warranty as standard, we also include guaranteed long-term support—with a history of supporting our products for typically 15-20 years.

To learn more go to pickeringtest.com/support

Available Product Resources

We have a library of resources including success stories, product and support videos, articles and white papers as well as application-specific brochures to assist you. We have also published reference books on switching technology and the PXI and LXI standards.

To view, download or request any of our product resources go to pickeringtest.com/resources