LXI EMR Low Thermal EMF Matrix 60-511

- Single Pole 56x33 Matrix
- Low Thermal Offset
- Excellent Low Level Switching Characteristics
- Uses High Quality Electro-Mechanical Relays
- Switch up to 200VDC/170VAC with 60W Max Power
- Maximum Switch Current of 1A
- 2U Rack Mountable Enclosure
- LXI Standard 1.4 Compliant
- IVI & Direct I/O Drivers
- Supported by *eBIRST* ™
- 3 Year Warranty

The 60-511 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.

Switching is carried out with high quality electro-mechanical relays with gold covered contacts. The routing of the switching matrix has been optimized for very low thermal offset.

The 60-511 is designed in accordance with the LXI Standard 1.4 and is supplied in a 2U high, full rack width case with 500mm depth.

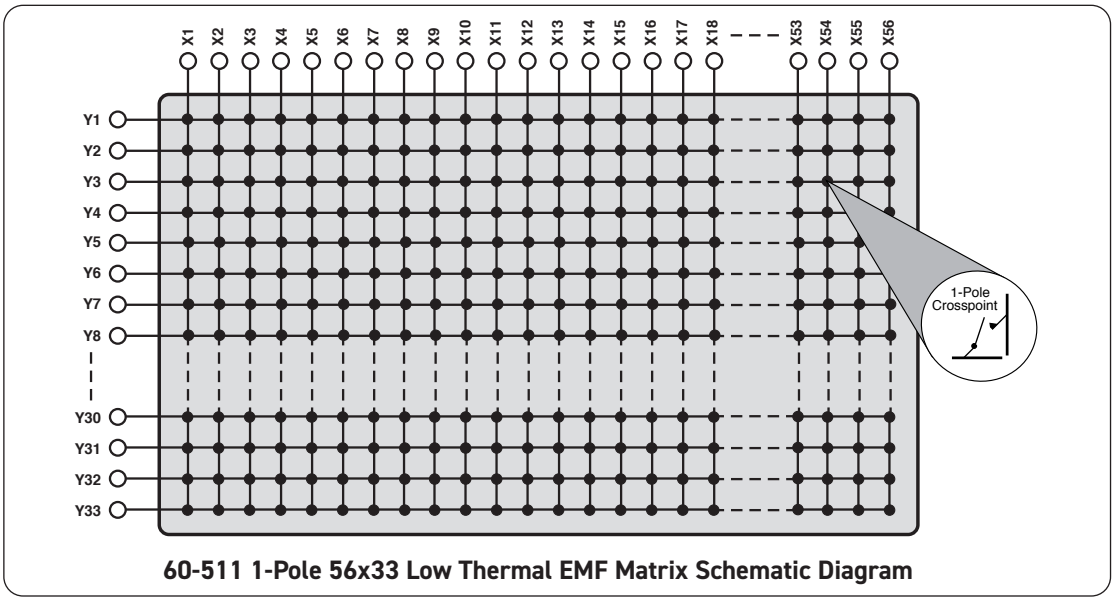
It is programmable via the LAN interface using Pickering Interfaces' generic switch driver. Industry standard (W3C) web browsers can be used to access and change configuration information and provide access to the soft front panels.

The 60-511 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



60-511 1-Pole 56x33 Low Thermal EMF Matrix Schematic Diagram

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Relay Type

The 60-511 is fitted with high quality electro-mechanical relays with palladium-ruthenium, gold covered bifurcated contacts.

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 60-511 chassis has four matrix circuit boards).

Switching Specification

Switch Type	Electro-mechanical
Contact Type:	Palladium-Ruthenium, Gold Covered Bifurcated
Max Switch Voltage:	200VDC/170VAC*
Max Hot Switch Power:	60W
Max Switch Current:	1A
Max Carry Current:	1A
Path Resistance - On:	500mΩ typical <1Ω maximum
Path Resistance - Off:	$>10^9\Omega$
Operate Time:	<3ms
Expected Life (operations)	
Very low power signal load:	$>1x10^8$
Low power load (2W):	$>1.5x10^7$ (0.1A 20VDC)
Medium power load (30W):	$>5x10^6$ (1A 30VDC)
Full power load (60W):	$>1x10^5$ (1A 60VDC)

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

Thermal EMF Specification

Relay Operated	Typical	Maximum †
1-pole (single ended):	<1.5µV	<3µV

† 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 264VAC 50-60Hz	
Power Inlet:	Male IEC connector

LAN Interface

Compliant to LXI Standard 1.4, the 60-511 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, 500mm 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 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 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 EMR Low Thermal EMF Matrix	60-511-001
1-Pole 42x33 EMR Low Thermal EMF Matrix	60-511-002
1-Pole 28x33 EMR Low Thermal EMF Matrix	60-511-003
1-Pole 14x33 EMR Low Thermal EMF Matrix	60-511-004

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 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.

Support Products

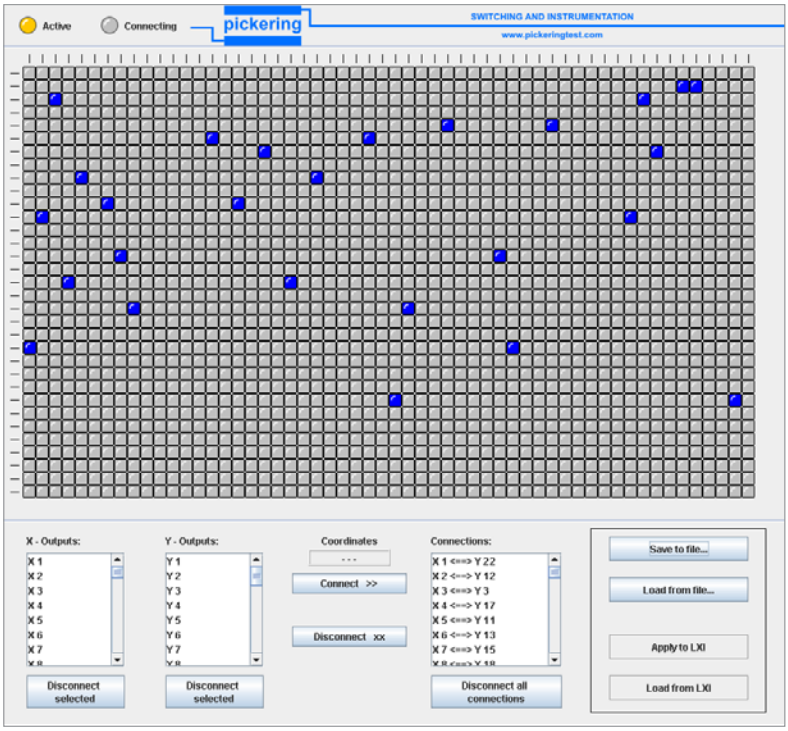
eBIRST Switching System Test Tool

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

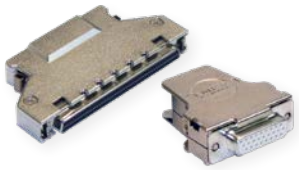
For connection accessories for the 60-511 please refer to the 90-007D 37-pin D-type and 90-008D 25-pin D-type Connector Accessories data sheets where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.



Soft Front Panel for the 60-511 LXI EMR Low Thermal EMF Matrix

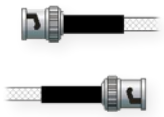
Connectivity Solutions

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.



Connectors & Backshells

Multiway Cable Assemblies



RF Cable Assemblies

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.
Visit: pickeringtest.com/cdt to start your design.

Mass Interconnect

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

Pickering Reed Relays

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

To learn more, please go to: pickeringrelay.com

Programming

All LXI devices are supplied with built-in software drivers, web pages for configuration and soft front panels as required by the LXI specification. A variety of drivers are provided (C, .NET, IVI, SOAP) which are compatible with all Microsoft supported versions of Windows and popular older versions. For a list of all supporting operating systems, please see: pickeringtest.com/os

The drivers may be used in many commonly used 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++, Visual C#)
- **Keysight** VEE and OpenTAP
- **Mathworks** Matlab
- **Marvin** ATEasy
- **MTQ Testsolutions** Tecap Test & Measurement Suite

As well as various open source environments such as:

- **Sharp Develop**
- **Dev-C++**

To learn more about software drivers and development environments, please 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, please 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.

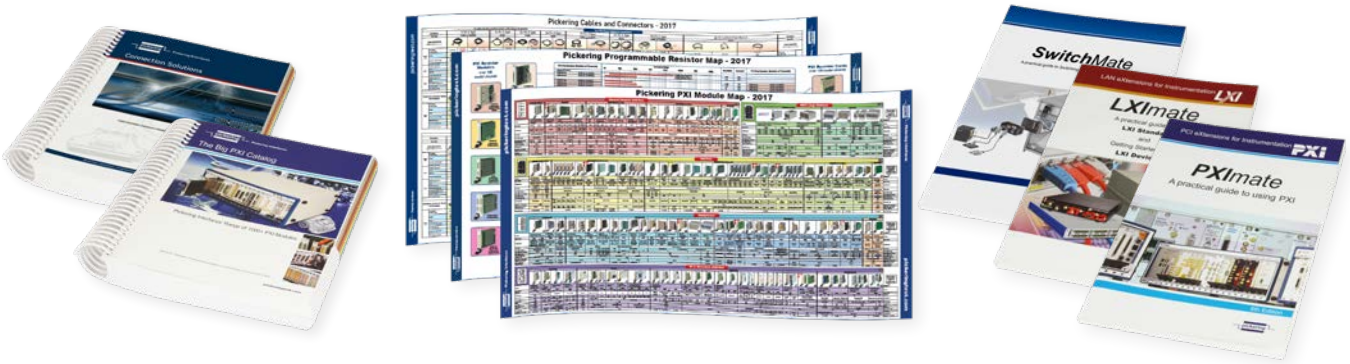
To learn more, please go to: pickeringtest.com/ebirst

Three Year Warranty

All standard products manufactured by Pickering Interfaces are warranted against defective materials and workmanship for a period of three years from the date of delivery to the original purchaser. Extended warranty and service agreements are available for all our modules and systems with various levels to suit 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, please go to: pickeringtest.com/support

Available Product Resources

We have a large library of product resources including success stories, product and support videos, articles, as well as complete product catalogs and product reference maps to assist when looking for the switching, simulation and cable and connector solutions you need. We have also published handy reference books on Switching Technology and for the PXI and LXI standards.



To view, download or request any of our product resources, please visit: pickeringtest.com/resources