



- High Performance RF Relays
- 18 GHz Bandwidth
- 12 SPDT Relays
- Excellent RF & Repeatability Characteristics
- LED Indication
- Compact 1 U Form Factor
- Relays Can be Removed From the Front of the Unit for Ease of Maintenance
- LXI Standard 1.5 Compliant
- IVI & Direct I/O Drivers
- 3 Year Warranty

The 60-890-003 Microwave Relay is suitable for switching 50 Ω signals up to 18 GHz. With 12 banks of SPDT relays it is ideal for constructing complex microwave switching systems for many applications. Connection is by high performance front panel mounted SMA connectors.

The 60-890-003's relays have an extremely high level of performance, offering low VSWR, very high isolation, low loss and high power handling. They are ideal for switching 50 Ω coaxial systems that require high performance from the HF band to microwave frequencies.

The 60-890-003 occupies just 1 U of valuable rack space, providing a space saving solution in the construction of microwave switching systems. The relays can be user connected to create customized switching systems.

Controlling the Relays

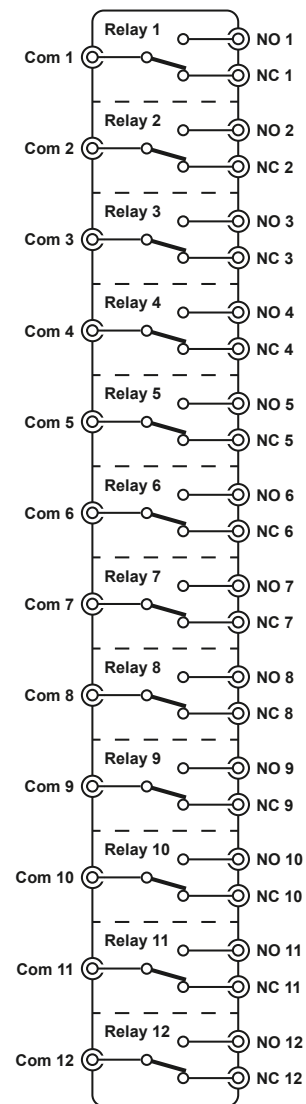
The 60-890-003 is controlled through an LXI interface based on Ethernet 1000Base-T. This provides a quick and easy method of installing the unit and a simple way of controlling it from a remote location through its API or built in soft front panel. The ability to control the unit at a distance allows the testing of systems without the need for a physical presence.

Easy Repair

To allow fast in field repair, pairs of relays are removed and then the individual relay replaced without removing the covers from the chassis or the chassis from the host rack.

Other Microwave Switching Configurations

We are able to offer other microwave switching solutions, if you have a custom requirement for switching please contact your local Pickering Interfaces sales representative.



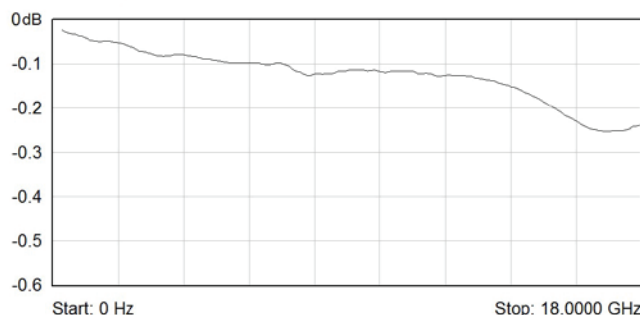
**Schematic Diagram for the 60-890-003
12xSPDT Microwave Relay**

General Specification - 50Ω Versions

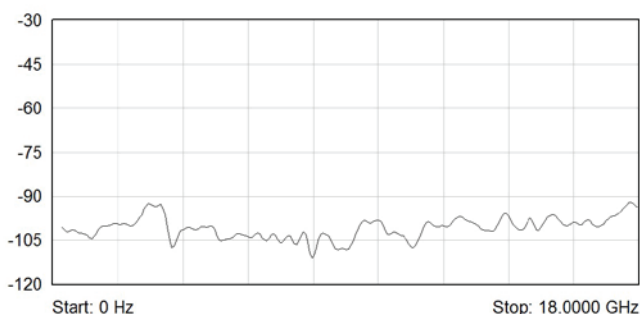
Configuration:	SPDT Microwave Switch, 12 independent banks.
LED Indicators:	Blue LEDs indicate activated relays
Operate Time:	10 ms typical
Expected Life:	>10 million operations

RF Additional Specification

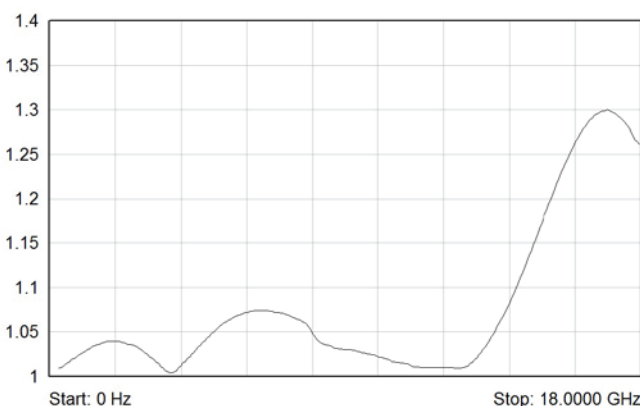
Bandwidth:	18 GHz
Characteristic Impedance:	50 Ω
Connectors:	SMA
Insertion Loss:	<0.15 dB to 3 GHz <0.20 dB to 8 GHz <0.25 dB to 12.4 GHz <0.35 dB to 18 GHz
Isolation:	>80 dB to 3 GHz >75 dB to 8 GHz >65 dB to 8 GHz >60 dB to 18 GHz
VSWR:	<1.1:1 0 to 3 GHz <1.2:1 to 8 GHz <1.2:1 to 12.4 GHz <1.4:1 to 18 GHz
RF Average Carry Power at 25°C:	240 W to 3 GHz 150 W to 8 GHz 120 W to 12.4 GHz 100 W to 18 GHz



Typical Insertion Loss Plot



Typical Isolation Plot



Typical VSWR Plot

Power Source

Universal AC mains supply, 90-120/200-240 V 50-60 Hz	
Power Inlet:	Male IEC connector
Power Rating:	100 VA maximum
Fuse Rating:	5 A, 250 V

LAN Interface

Compliant to LXI Standard 1.5, the 60-890 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.

LXI Status Indicators

Front panel mounted LEDs:

- Power
- Ready
- Error
- LAN
- Active

Mechanical Characteristics

Supplied with front panel ears to enable rack mounting on a shelf or other rear support mechanism.

Dimensions: Full 19" rack width, 500 mm depth, 1 U high
3D models for all versions in a variety of popular file formats are available on request.

Connectors

Signals via front panel SMA connectors.

Cooling

Fan assisted cooling, front air intakes and rear exhaust.

Operating/Storage Conditions

Operating Conditions

Operating Temperature:	0 °C to +55 °C
Humidity:	Up to 90 % non-condensing
Altitude:	5000 m

Storage and Transport Conditions

Storage Temperature:	-20 °C to +75 °C
Humidity:	Up to 90 % non-condensing
Altitude:	15000 m

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

**LXI Microwave Relay, 50 Ω
12xSPDT, 18 GHz, SMA, 1 U** **60-890-003**

Versions with other bank counts and different frequency ranges can be made to order, please contact sales office.

Accessories:

**Spare Microwave Relay - Single SPDT
(SPDT relay connected to interface PCB)** **91-100-105**

**Spare Microwave Relay - Dual SPDT
(two SPDT relays connected to interface
PCBs, fitted to relay mounting block,
including fixing screws)** **91-100-101**

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.

Mating Connectors & Cabling

For connection accessories for the 60-890 please refer to the [90-011D](#) RF Cable Assemblies data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

Further LXI RF Switching Solutions from Pickering Interfaces



60-760 LXI Dual 24x8 HF Matrix. Software configurable as a 48x8 matrix it has bandwidth useable up to 100 MHz.



60-750/751 LXI Microwave Matrix. Bandwidth up to 20 GHz and is available in sizes from Single 3x3 up to Dual 4x4 with Loop-Thru and termination options.



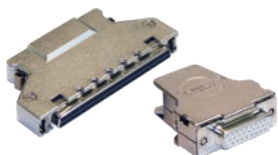
60-721A LXI 72-Channel High Performance Video Multiplexer with a 1 GHz bandwidth.



60-801/802 LXI Microwave Multiplexer, up to 40 GHz bandwidth and support for up to 16 banks of 6 or 4 way multiplexers.

Connectivity Solutions

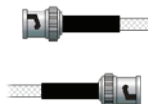
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed 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 Relay Division. 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

Pickering provide kernel, IVI and VISA (NI & Keysight) drivers 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 VISA driver is also compatible with Real-Time Operating Systems such as LabVIEW 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++)
- **Keysight** VEE and OpenTAP
- **Mathworks** Matlab
- **Marvin** ATEasy
- **MTQ Testsolutions** Tecap Test & Measurement Suite

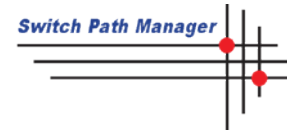
As well as various open source environments such as:

- **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 & Guaranteed Long-Term Support

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 and white papers as well as application specific product brochures to assist when looking for the switching, simulation and connection 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