- **High Performance Microwave Switches**
- **40GHz Bandwidth**
- **3 Banks of SPDT & 4 Banks of SP6T Switches**
- **Unused Signals Terminated into 50Ω**
- **Excellent RF & Repeatability Characteristics**
- **Field Upgradeable to Maximum Loading**

- **LED Indication**
- **Compact 2U Form Factor**
- **LXI Standard 1.4 Compliant**
- **IVI & Direct I/O Drivers**
- **3 Year Warranty**

The 60-890-005 Microwave Switch is suitable for switching 50Ω signals up to 40GHz. With 3 banks of SPDT and 4 banks of SP6T it is ideal for constructing complex microwave switching systems. Additional relays can be fitted to a maximum loading of 6 banks of SPDT and 6 banks of SP6T. All unused signal paths are automatically connected to 50Ω terminations. Signal connections are by front panel mounted SMA-2.9 connectors.
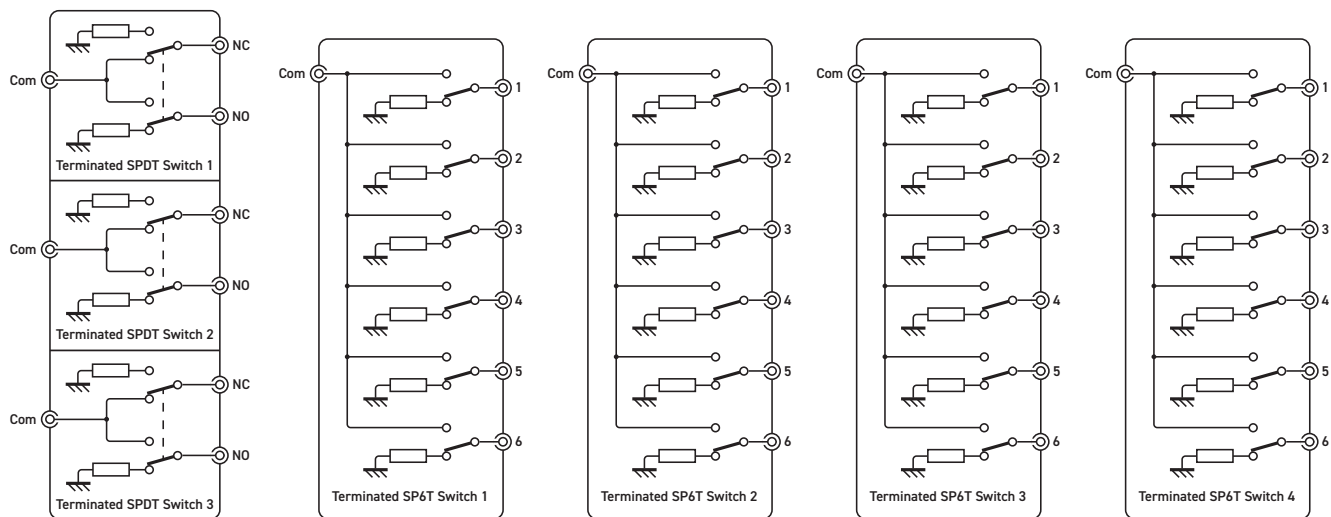
The switch has an extremely high level of performance with low VSWR, very high isolation, low loss and high power handling. It is ideal for switching 50Ω systems for HF up to microwave frequencies. It occupies 2U of rack space, providing a compact switching solution.

Controlling the Switch

The 60-890-005 is controlled through an LXI interface based on Ethernet 1000Base-T. This provides a quick and easy method of installing the 60-890-005 and a simple way of controlling the unit 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.

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 60-890-005 40GHz Terminated Microwave Switch - 3xSPDT & 4xSP6T

pickering

General Specification - SPDT Terminated Switch

Relay Manufacturer:	Radiall
Configuration:	SPDT Terminated Microwave Switch.
Indicators:	Blue LED to indicate switch is activated.
Operate Time:	<10ms

RF Specification - SPDT Terminated Switch

Characteristic Impedance:	50Ω
Connectors:	SMA-2.9
Bandwidth	DC to 40GHz
Isolation:	70dB (0-6GHz) 60dB (6-12.4GHz) 60dB (12.4-18GHz) 55dB (18-26.5GHz) 50dB (26.5-40GHz)
Insertion Loss:	0.3dB (0-6GHz) 0.4dB (6-12.4GHz) 0.5dB (12.4-18GHz) 0.7dB (18-26.5GHz) 0.8dB (26.5-40GHz)
VSWR:	1.3:1 (0-6GHz) 1.4:1 (6-12.4GHz) 1.5:1 (12.4-18GHz) 1.7:1(18-26.5GHz) 1.9:1 (26.5-40GHz
Average RF Carry Power:	80W (0-6GHz) 60W (6-12.4GHz) 50W (12.4-18GHz) 20W (18-26.5GHz) 10W (26.5-40GHz)
Termination power rating:	1W per termination,
Expected Life (Low Power):	2 million operations

General Specification - SP6T Terminated Switch

Relay Manufacturer:	Radiall
Configuration:	SP6T Terminated Microwave Multiplexer.
Indicators:	Blue LEDs to indicate a closed RF path.
Operate Time:	Typically 15ms

RF Specification - SP6T Terminated Switch

Characteristic Impedance:	50Ω
Connectors:	SMA-2.9
Bandwidth	DC to 40GHz
Isolation:	70dB (0-6GHz) 60dB (6-12.4GHz) 60dB (12.4-18GHz) 55dB (18-26.5GHz) 50dB (26.5-40GHz)
Insertion Loss:	0.2dB (0-6GHz) 0.4dB (6-12.4GHz) 0.5dB (12.4-18GHz) 0.7dB (18-26.5GHz) 1.1dB (26.5-40GHz)
VSWR:	1.3:1 (0-6GHz) 1.4:1 (6-12.4GHz) 1.5:1 (12.4-18GHz) 1.7:1(18-26.5GHz) 2.2:1 (26.5-40GHz
Maximum RF Carry Power:	40W (0-6GHz) 30W (6-12.4GHz) 25W (12.4-18GHz) 15W (18-26.5GHz) 5W (26.5-40GHz)
Termination power rating:	1W per termination, 3W total per 6 channel multiplexer
Expected Life (Low Power):	>2 million operations per position

Power Source

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

LAN Interface

Compliant to LXI Standard 1.4, the 60-890-005 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: 2U high, full 19" 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 SMA-2.9 connectors.

Cooling

Fan assisted cooling, side air intakes and rear exhaust.

Operating/Storage Conditions

Operating Conditions

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

Storage and Transport Conditions

Storage Temperature:	-20°C to +75°C
Humidity:	Up to 90% 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

LXI 40GHz 3xSPDT & 4xSP6T Terminated Microwave Switch, 50Ω	**60-890-005**

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

Additional Switch Order Codes:	
SPDT, Terminated, 40GHz Assembly	91-100-106
SP6T, Terminated, 40GHz Assembly	91-100-107

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 60-890-005 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

60-891 LXI 36:1 Microwave Multiplexer. Available With SMA Connectors (18GHz) or BNC Connectors (4GHz).

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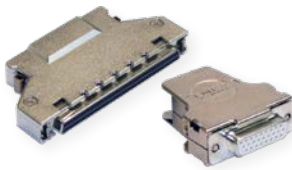

60-721A LXI 72-Channel High Performance Video Multiplexer with a 1GHz bandwidth.

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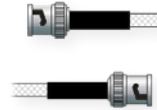
Connectivity Solutions

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

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.

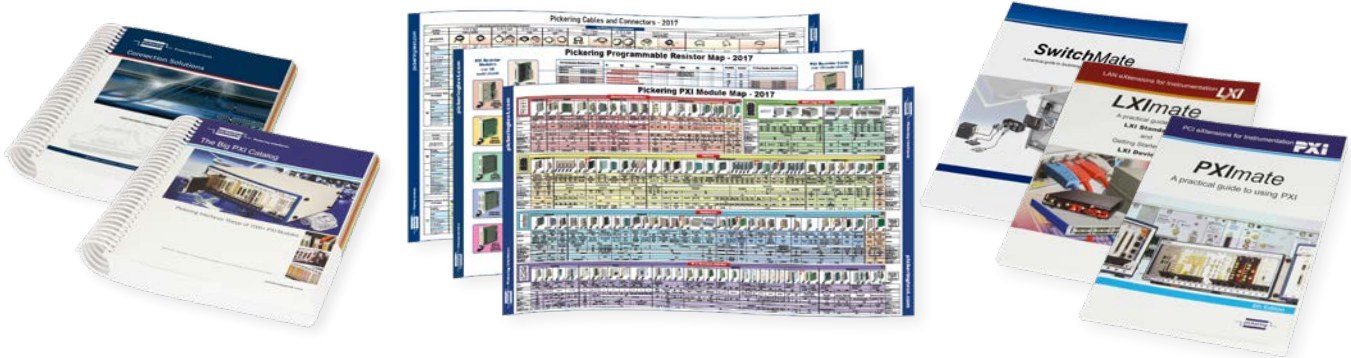To learn more, please go to: pickeringtest.com/ebirst

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