

# L8990M Modular Signal Routing Solution

## Introduction

The Keysight L8990M Modular Signal Routing Solution provides a simple and flexible platform for RF signal routing and monitoring. The L8990M can support up to 64 switch channels in a 2U rack-mountable enclosure with signal frequencies up to 67 GHz. It can support up to 96 switch channels in a 4U high enclosure. This provides the capability to route signals for testing a wide range of RF and telecommunication products and devices.

## Features and Benefits

- Excellent RF performance – based on the proven family of Keysight RF switches, couplers, and dividers specified for low loss and high repeatability of applications up to 67 GHz
- User-defined configurations – modules and slot locations are specified by the user
- 8 weeks or less delivery – many modules maintained in stock
- Lower cost – standard platform and modules
- Automated and manual control – based on the Keysight Smart Switch Controller with LAN, SCPI commands, resident GUI viewable via web browser, and IVI Drivers
- Accessories and custom capabilities – RF cables and other RF devices
- Field re-configuration when adding or changing modules
- Optional rear panel power switch and status LEDs to free up-front panel space
- CE Mark

## Applications

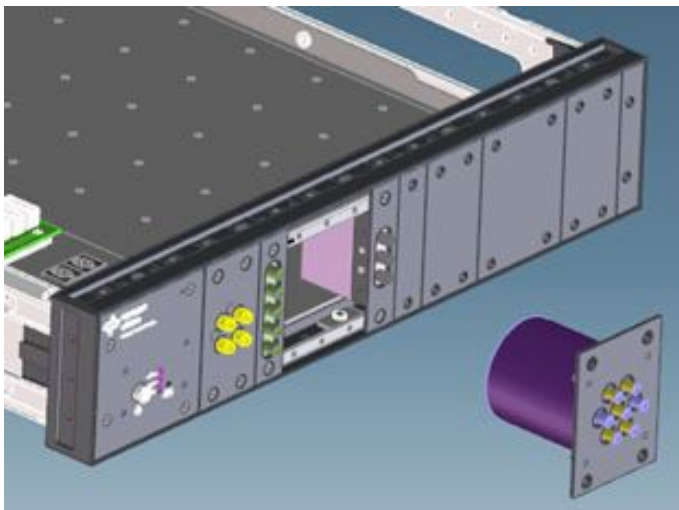
The Keysight L8990M Modular Signal Routing Solution is useful for prototyping, benchtop setups and integrated systems in a wide variety of RF applications including:

- Satellite
- Antennas
- Radar
- Electronic warfare
- Radios
- RF components
- Mobile phones
- Base stations

## Modular Signal Routing Solution Description

Each L8990M Modular Signal Routing Solution is delivered fully integrated according to the user-specified configuration.

- The Modular Signal Routing Solution includes:
- Rack-mountable enclosure, either 2U or 4U in height
- Modules installed in front panel slots - each module consists of a switch or another RF component secured to a sub-panel
- Filler panels in unused slots
- Internal controller and power supply
- Internal driver boards and cables necessary to support chosen modules
- User manual, customized for the specified configuration
- Flexible and Semi Rigid RF cables available



## Standard Modules

The following standard modules support our most popular RF switches, couplers, and programmable attenuators. Many are maintained in stock for fastest delivery. The 'X' in the Module Part Number column is the Frequency letter from the Frequency Column.

Module Part Number	Description	Frequency (B/C/D/E/F)	Total slots filled
L3111X	N1810TL; SPDT switch, terminated	20 GHz, 26.5 GHz, 40 GHz, 50 GHz, 67 GHz	1
L3113X	N1810UL; SPDT switch, unterminated	20 GHz, 26.5 GHz, 40 GHz, 50 GHz, 67 GHz	1
L3114X	N1811TL; 4-port bypass switch, terminated	20 GHz, 26.5 GHz, 40 GHz, 50 GHz, 67 GHz	1
L3117X	N1812UL; 5-port bypass switch, unterminated	20 GHz, 26.5 GHz, 40 GHz, 50 GHz, 67 GHz	1
L3122X	87104x; SP4T multiport switch	20 GHz, 26.5 GHz, 40 GHz, 50 GHz, 54 GHz, 67 GHz	3
L3122XL	87104x; SP4T multiport switch with LEDs	20 GHz, 26.5 GHz, 40 GHz, 50 GHz, 54 GHz, 67 GHz	3
L3121X	87106x; SP6T multiport switch	20 GHz, 26.5 GHz, 40 GHz, 50 GHz, 54 GHz, 67 GHz	3
L3121XL	87106x; SP6T multiport switch with LEDs	20 GHz, 26.5 GHz, 40 GHz, 50 GHz, 54 GHz, 67 GHz	3
L3131X	87222x; transfer switch	20 GHz, 26.5 GHz, 40 GHz, 50 GHz	2
L3126B	87406x; 6-port switch	20 GHz	3
L3127B	87606x; 6-port switch	20 GHz	3
L3041X	84904x; attenuator 1-11 dB	26.5 GHz, 40 GHz	2
L3042X	84905x; attenuator 1-11 dB	50 GHz	2
L3044X	84907x; attenuator 0-70 dB	26.5 GHz, 40 GHz	2
L3043X	84906x; attenuator 0-90 dB	26.5 GHz, 40 GHz, 50 GHz	2
L3051B	87300B; coax dir. coupler, 10 dB	1-20 GHz	2
L3052B	87300C; coax dir. coupler, 10 dB	1-26.5 GHz	2
L3053B	87300D; coax dir. coupler, 10 dB	6-26.5 GHz	2
L3054E	87301B; coax dir. coupler, 10 dB	10-46 GHz	2
L3055E	87301C; coax dir. coupler, 10 dB	10-50 GHz	2
L3056D	87301D; coax dir. coupler, 13 dB	1-40 GHz	2
L3057E	87301E; coax dir. coupler, 10 dB	2-50 GHz	2
L3032A	LEDs – 2 position	NA	1
L3033A	LEDs – 4 position	NA	1
L3034A	LEDs – 6 position	NA	1

Detailed specifications for each of the components listed in the Description column above are available online.

Switches:

<http://literature.cdn.keysight.com/litweb/pdf/5989-6031EN.pdf?id=1462161>

Couplers:

<https://www.keysight.com/us/en/assets/7018-02454/product-fact-sheets/5990-5353.pdf>

Programmable attenuators:

<https://www.keysight.com/us/en/assets/7018-01620/brochures/5989-6948.pdf>

## Accessories

Low-loss, flexible RF cables for external interconnect of installed modules are available. The following cables are maintained in stock for fastest delivery:

- Flexible RF cables in 26.5, 40, 50 or 67 GHz – 6, 8, and 12-inch lengths available.

## Custom Modules and Capabilities

In addition to the standard modules listed above, Keysight is able to deliver the L8990M with custom capabilities, including:

- Custom Modules. Keysight can install other RF components in a L8990M module. This may include amplifiers, attenuators (both fixed and variable), combiners, dividers, adapters (e.g. N-type for mounting a noise generator) and other devices. Multiple switches can be mounted on a single module.
- Semi-rigid RF cables for repeatable interconnect of installed modules. Front covers are included to protect the installed cables during shipment.

Note: The custom modules are typically limited to components that can be mounted directly on a L8990M sub-panel, are passive or can otherwise be controlled/powered by the standard Smart Switch Controller.

For challenging applications, please contact Keysight at the email address listed below. Keysight has shipped many custom switch matrices in response to a wide range of application-specific requirements.

# L8990M Control and Enclosure

## Software and control

The L8990M Modular Signal Routing Solution platform is based on the standard Keysight Smart Switch Controller. This controller provides a standard set of programming commands and a defined web-based GUI for manual control and monitoring of the installed switches. Several different control methods are available:

- Set of standard SCPI commands
- IVI Drivers
- Web-based graphical user interface via the LAN - this GUI enables effortless manual operation of the switches and provides visual indication of the switch positions



The LAN connector is on the rear panel. For more information on the Smart Switch Controller platform, refer to <https://www.keysight.com/us/en/assets/7018-06144/product-fact-sheets/5992-2938.pdf>.

## AC power

The L8990M Modular Switch Matrix is powered by standard 100 V to 240 V, 50-60 Hz AC input. The power input connector is fused and located on the rear panel.

## Physical size

The L8990M Modular Switch Matrix is standard rack mount width, either 2U or 4U in height and 421.6 mm (17 inches) or 584 mm (23 inches) deep. Feet and rack mount ears with handles are included.



## Price and Delivery

To request pricing and delivery, simply send an email to; [quotes.adsys@keysight.com](mailto:quotes.adsys@keysight.com), or fill out the configuration form available here: <https://www.keysight.com/us/en/assets/7018-05692/technical-overviews/5992-2227.pdf>

## Application Assistance:

Keysight's application experts are available to help optimize the system, taking full advantage of the modular capability for your unique application.

Operator training is also available to help you get the system into service quickly.

If your application goes beyond the standard modular offering described above, Keysight program managers and engineering professionals can help define and implement unique functionality. They can ensure that your custom system requirements are implemented successfully.

Learn more at: [www.keysight.com](http://www.keysight.com)

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: [www.keysight.com/find/contactus](http://www.keysight.com/find/contactus)

