IQ5861™
mmWave Switch Control Kit

LITEPOINT

Overview

The IQ5861 Switch Control Kit, is an optional accessory for LitePoints IQgig-5G Model B test system when performing over-the-air (OTA) testing of mmWave devices. It distributes the test system's bidirectional RF ports to multiple user ports. Together with the companion tester (sold separately), the IQ5861 kit enables parallel control of multiple LitePoint Single-Pole Four-Throw (SP4T) switches to enable multi-device testing for manufacturing.

The accessory kit consists of an IQ5861 Control Box, one SP4T switch, an iPass cable to establish the connection between the control box and the tester and a Micro-D cable connecting the control box and the switch. Additional SP4T switches (up to 4 total) can be purchased. The key function of the switch is to relay the signal (VSA/VSG) between the tester and the DUT. The control box provides power and control to each switch. Once connected to the test system, the IQ5861 integrates seamlessly and facilitates easy control of the switch using the tester SCPI commands.

Each IQ5861 Switch Control kit includes

- One IQ5861 Control Box
- One SP4T Switch
- One iPass cable
- One Micro-D connector cable

Key Features

- Simple solution for over-the-air testing of multiple antenna arrays and multiple devices.
- Distributes the tester VSG signal to multiple measurement horn antennas using the bidirectional RF ports of the SP4T switch
- Enables measurement and signal analysis (VSA) from multiple measurement horn antennas.
- Enables RF switching and control via simple SCPI commands
- Faster RF switching between multiple RF ports

IQ5861 Control Box

Top View

Side View

I/O	Function	Type
CTRL1	Power and Control	9 pin Micro-D female connector
CTLR2	Power and Control	9 pin Micro-D female connector
CTLR3	Power and Control	9 pin Micro-D female connector
CTRL4	Power and Control	9 pin Micro-D female connector
STATUS	LED green – indicates connection to the tester	LED indicator
COMMON	Power and Control	26 pin iPass connector

SP4T Switch

Top View
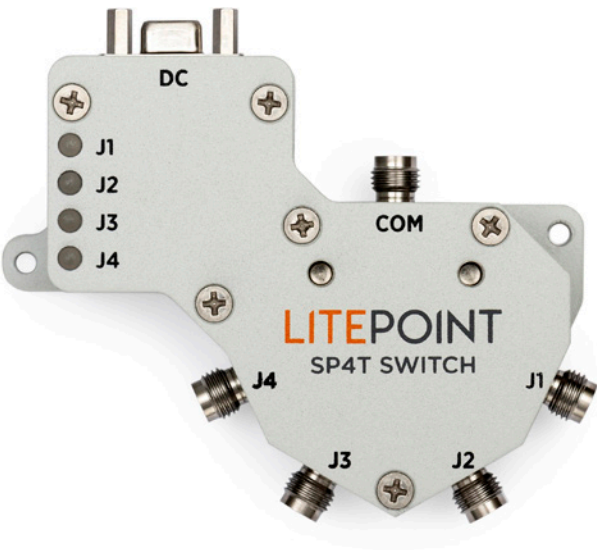
Side View

I/O	Function	Type
J1	RF input / output	2.4mm female
J2	RF input / output	2.4mm female
J3	RF input / output	2.4mm female
J4	RF input / output	2.4mm female
J1 Port Indicator	LED green– indicates port J1 active	LED indicator
J2 Port Indicator	LED green– indicates port J2 active	LED indicator
J3 Port Indicator	LED green– indicates port J3 active	LED indicator
J4 Port Indicator	LED green– indicates port J4 active	LED indicator
DC	Power and Control	9 pin Micro-D female connector
COM	VSA input or VSG output	2.4mm female

General Hardware Specifications

IQ5861 Control Box

Parameter	Value
Output Voltage	+5V, +3.3V, -5V
Maximum Number of Switch Connections Supported	4

SP4T Switch

Parameter	Value
Switch Type	Solid State
Configuration	SP4T
Termination	Reflective
Frequency Range	20 GHz – 45 GHz
Insertion Loss between COM and J1 to J4 (ON) < 30 GHz < 40 GHz < 45 GHz	 < 5 dB < 6.5 dB < 7 dB
Isolation between COM and J1 to J4 (OFF) < 30 GHz < 40 GHz < 45 GHz	 > 35 dB > 30 dB > 27 dB

Max RF Input Power
  Through Path
  Hot Switching
	
	27 dBm
	27 dBm

Input Linearity 0.1 dB Power Compression	> +25 dBm Typical
Switching Speed (0.1 dB)	< 1μsec

## General and Environmental

IQ5861 Control Box

Parameter	Value
Dimensions	6.65"(L) x 4.33"(B) x 1.24"(H) (169 mm x 110 mm x 31 mm)
Weight	1.5 lb. (680 gm)
Operating temperature	0°C to +85°C
Storage temperature	-20°C to +70°C (IEC EN60068-2-1, 2, 14)
Specification validity temperature	20°C to 35°C (valid range for specifications)
Operating humidity	15% to 95% relative humidity, non-condensing (IEC EN60068-2-30)
EMC/EMI	61326-1: 2013 Industrial Environment, CISPR11 Class A per EN61326-1:2013, FCC Part 15 Class A, VCCI V-3 Class A, BSMI CNS-13438 Class A, ACMA AS/NZS CISPR11: 2011, ICES-003 Class A
Safety	IEC 61010-1, EN61010-1, UL61010-1:2012 and Canada: CSA C22.2 No. 61010-1, GI1, GI2
Warranty	12 months hardware

SP4T Switch

Parameter	Value
Dimensions	3.16" x 2.75" x 0.80" (80 mm x 70 mm x 20 mm)
Weight	0.3 lb. (136 gm)
Operating temperature	0°C to +85°C (IEC EN60068-2-1, 2, 14)
Storage temperature	-20°C to +70°C (IEC EN60068-2-1, 2, 14)
Specification validity temperature	20°C to 35°C (valid range for specifications)
Operating humidity	15% to 95% relative humidity, non-condensing (IEC EN60068-2-30)
EMC/EMI	61326-1: 2013 Industrial Environment, CISPR11 Class A per EN61326-1:2013, FCC Part 15 Class A, VCCI V-3 Class A, BSMI CNS-13438 Class A, ACMA AS/NZS CISPR11: 2011, ICES-003 Class A
Safety	IEC 61010-1, EN61010-1, UL61010-1:2012 and Canada: CSA C22.2 No. 61010-1, GI1, GI2
Warranty	12 months hardware

Connection Diagram

Below is an example setup exhibiting mmWave multi-DUT testing Over-The-Air (OTA) using the IQ5861 switch control kit.

The setup consists of a tester (in this case an IQgig-5G Model-B) responsible for all the signal generation and analysis at mmWave frequencies, four OTA chambers enabling testing of devices with multiple antenna arrays, one control box and four SP4T switches.

As illustrated in the diagram below, the function of the SP4T switch is to relay the VSA/VSG signal between the tester and the DUT. This is accomplished by connecting each of the four ports (J1- J4) of the switch to the vertical and horizontal polarization of the measurement horn antennas within the chamber and the COM port to the tester.

Finally, to control the LitePoint SP4T switches and enable desired & timely switching of the signal, the control box is used. In addition to generating the DC supply to power the switches, the box also enables parallel control of the SP4T switches using the tester SCPI commands. The former is achieved by connecting the control box to the tester using an iPass cable and connecting the switches using a Micro-D connector cable.
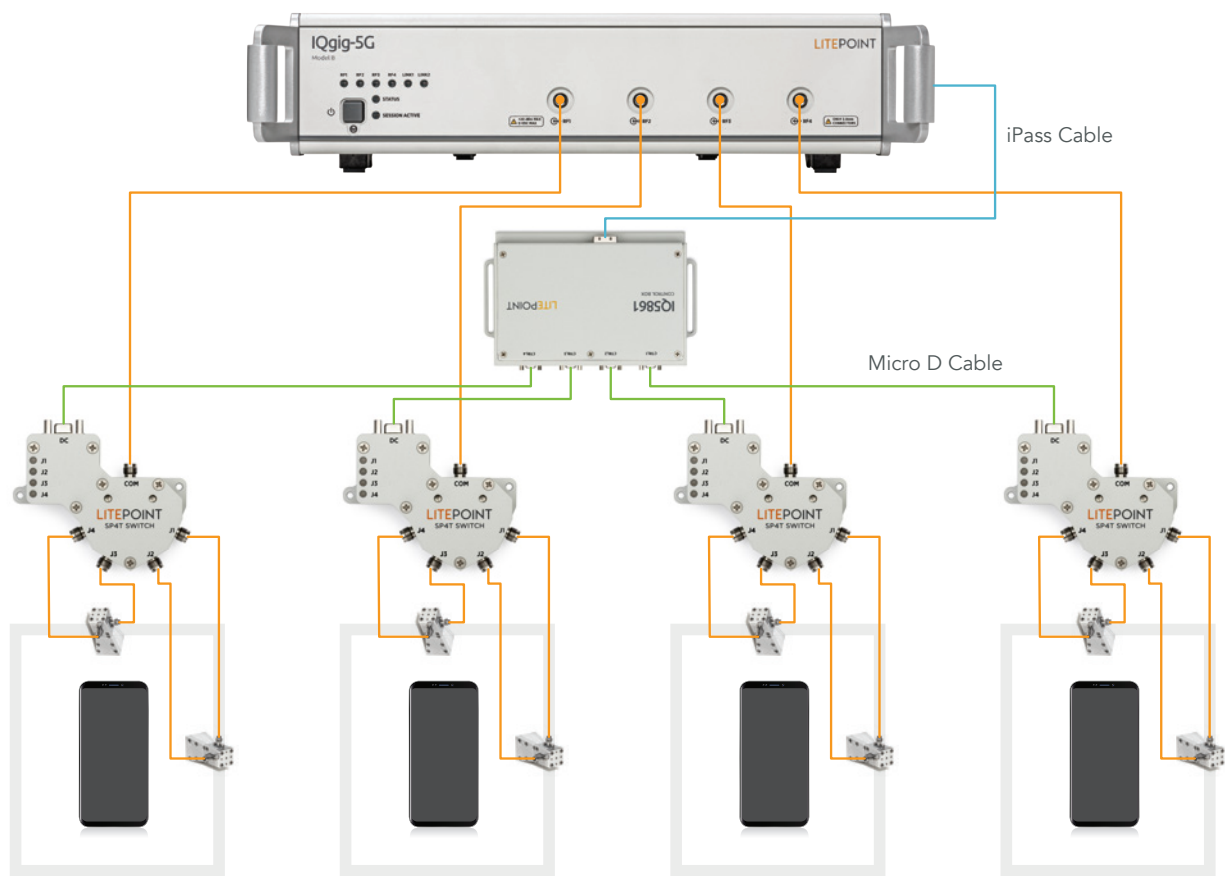
Order Codes

Code	Product
0150-IG5G-031	IQ5861 Switch Control Kit
0150-IG5G-032	mmWave SP4T Switch Kit

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