

IQ5631™

Power and Delay
Control Module



Overview

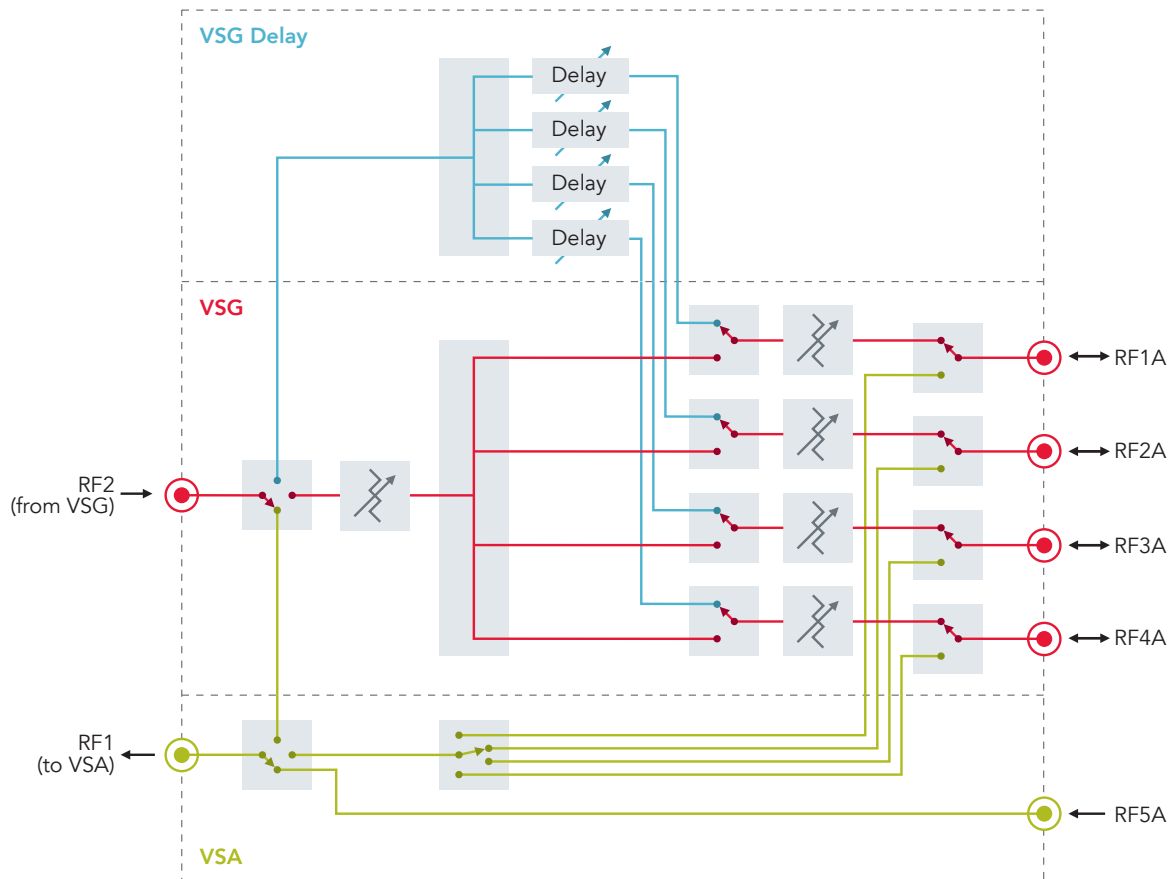
The IQ5631 Power and Delay Control Module (PDCM) is an optional accessory for a LitePoint test system when generating and measuring RF signals. It distributes the test system's vector signal generator (VSG) to multiple user RF ports, including programmable control of the per-port amplitude and delay. It additionally allows the user to switch the test system vector signal analyzer (VSA) to any of the IQ5631 user RF ports.

The IQ5631 enables multiple advanced features, such as multi-device testing for manufacturing as well as application-specific measurements, including time-of-flight (ToF) or angle-of-arrival (AoA). A companion LitePoint test system (sold separately) provides communication and power to the IQ5631 via a DB25 digital control cable. When connected to a LitePoint test system, the IQ5631 is seamlessly integrated in the test system firmware, enabling simple and fast control of the module.

Key Features

- Distributes 2 tester RF port connections (VSA and VSG) to 4 bidirectional user ports and a dedicated measurement (VSA) port
- Broadcasts a VSG signal simultaneously to 1 or more user RF ports
- Enables user-programmable, per-port VSG level control with variable attenuation
- Precision timing calibration enables accurate time-of-flight (ToF) measurements
- Includes programmable per-port delay control for angle-of-arrival (AoA) measurements

Functional Block Diagram



Port Descriptions



I/O	Function	Type
RF1	RF output, Connection to tester VSA Port RF1	SMA female
RF2	RF input, Connection to tester VSG Port RF2	SMA female
RF1A	RF input / output	SMA female
RF2A	RF input / output	SMA female
RF3A	RF input / output	SMA female
RF4A	RF input / output	SMA female
RF5A	RF input	SMA female
Power Indicator	LED - green indicates power is applied	LED indicator
RF1 Port Indicator	LED green - port is a VSA input LED red - port is a VSG output LED orange - port is in VSG delay mode	LED indicator
RF2 Port Indicator	LED green - port is a VSA input LED red - port is a VSG output LED orange - port is in VSG delay mode	LED indicator
RF3 Port Indicator	LED green - port is a VSA input LED red - port is a VSG output LED orange - port is in VSG delay mode	LED indicator
RF4 Port Indicator	LED green - port is a VSA input LED red - port is a VSG output LED orange - port is in VSG delay mode	LED indicator
RF5 Port Indicator	LED green - port is a VSA input	LED indicator
CONTROL	Power and Control signals	DB25 (female)

General Hardware Specifications

Parameter	Ports	Value
Frequency Range	All Ports	5 GHz – 12 GHz
	RF1A – RF4A VSG Delay Mode	6 GHz – 10.2 GHz
Maximum Input Power (VSA Mode)	RF1A – RF5A	+24 dBm (CW)
Insertion Loss (VSA)	RF1A – RF4A	< 12 dB
	RF5A	< 8 dB
Insertion Loss (VSG Delay Mode)	RF1A – RF4A	< 40 dB
Programmable Attenuation Range (VSG)	RF1A – RF4A	20 to 50 dB
Maximum Settable Attenuation Difference Between Ports (VSG)	RF1A – RF4A	10 dB
Programmable Attenuation Accuracy (VSG) ¹	RF1A – RF4A	± 0.8 dB
Delay Line Step Resolution (VSG Delay Mode)	RF1A – RF4A	5 ps
Delay Step Accuracy, Port-to-Port (VSG Delay Mode)	RF1A – RF4A VSG Delay Mode	±10 ps
Delay Line Maximum Delay (VSG Delay Mode)	RF1A – RF4A	80 ps (nominal)
VSWR	RF1A – RF5A	< 2.1:1 (typical)
	RF1, RF2	< 2.1:1 (typical)
Port-to-Port Isolation	RF1A-to-RF4A VSG Mode "On" port to "Off" ports	> 45 dB, at min attenuation
	RF1A-to-RF4A VSG Delay Mode "On" port to "Off" ports	> 45 dB, at min attenuation
	RF2-to-RF1 VSA mode, signal applied to RF2	> 50 dB
	RFxA-to-RF1 VSA Mode	> 55 dB (RF1A to RF4A) > 50 dB (RF5A)
Recommended cable length between tester and IQ5631	RF1, RF2	≤ 6 feet (1.8 m)
Maximum length of GPIO Control Cable	CONTROL	6 feet

¹ Measured at the center frequency of the IQgig-UWB, 5.8 GHz to 12 GHz

General and Environmental

Parameters	Value
Dimensions	8.42" W x 1.02" H x 4.26" D (214 mm x 26 mm x 108 mm)
Weight	1.25 kg (2.75 pounds)
Operating temperature	+10°C to +55°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	EN 61326 Immunity for industrial environment, Class B emissions
Safety	IEC 61010-1, EN61010-1, UL3111-1, CAN/CSA-C22.2 No. 1010.1
Mechanical vibration	IEC 60068, IEC 61010 and MIL-T-28800D, class 5
Mechanical shock	ASTM D3332-99, Method B
Recommended connector torque	5 in-lbs (56 N-cm)
Recommended calibration cycle	12 months
Warranty	12 months hardware

Order Codes

Code	Product
0150-5631-002	IQ5631 Power and Delay Control Module

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