M9416A VXT PXIe Vector Transceiver

380 MHz to 12.3 GHz

Overview

This configuration guide contains information to help you configure your M9416A VXT PXIe vector transceiver to meet your requirements. Ordering optional capabilities at time of purchase provides the lowest overall cost.

KEYSIGHT

Included in Base Product

Standard options and accessories come with the VXT base model at no additional charge and do not need to be ordered. They include:

- Option B4X: 400 MHz modulation and analysis bandwidth
- Option M02: Memory, 256 MSa
- N9060EM0E I/Q analyzer
- Cable, MMPX male to SMB male, 260 mm
- Getting Started Guide

Hardware

A. Select options for VXT PXIe vector transceiver

Step 1. Choose your module		
M9416A-001	VXT PXIe vector transceiver	
Step 2. Choose maximum frequency range		
M9416A-F06	Frequency range, 380 MHz to 6 GHz	
M9416A-F08	Frequency range, 380 MHz to 8 GHz	
M9416A-F12	Frequency range, 380 MHz to 12.3 GHz	
Step 3. Choose modulation and analysis bandwidth		
M9416A-B4X	400 MHz bandwidth	Included in base configuration
M9416A-B8X	800 MHz bandwidth	
M9416A-B12	1.2 GHz bandwidth	
Step 4. Choose memory size		
M9416A-M02	256 MSa	Included in base configuration
M9416A-M05	512 MSa	
Step 5. Add high output power		
M9416A-1EA	High output power	
Step 6. Add duplex port		
M9416A-HDX	Half duplex port	
Step 7. Add measurement capability		
M9416A-SQC	Support sequence analyzer measurement application	
M9416A-MMO	Timing Synchronization for ccEVM and WLAN MIMO	
M9416A-STM	IQ streaming In/Out via backplane	

B. Add M9300A PXIe frequency reference

Step 1. Add an M9300A PXIe frequency reference (occupies 1 slot)		
One frequency reference required per system to meet data sheet specifications.		
M9300A	PXIe frequency reference	Five 100 MHz outputs
M9300A-S01 [1]		One 10 MHz output
		Internal 10 MHz OCXO time-base output

1. No export license agreement.

C. Select controller (either embedded controller or via PC)

Step 1. Select embedded controller [1]	
M9035A-M16 PXIe embedded controller, Intel i3-8100H quad-core processor, 3.0 GHz, 4-thread, 16 GB RAM	
M9038A-M32 High-performance embedded controller, Intel i7-9850HE 6-core processor, 2.7 GHz, 12-thread, 32 GB RAM, with two Thunderbolt 3.0 ports	
Select M9038A for the best performance if you have memory intensive applications, multiple applications running in parallel, or if a lot of data is sent to the PC from the PXIe chassis. Features removable SSD drive for security and multiple connectors from front for connection to second chassis	

Step 2. Upgrade from standard memory size (optional)	
M9035A-M32	Memory upgrade to 32 GB RAM
M9038A-M64	Memory upgrade to 64 GB RAM

To use your desktop PC as a controller [2, 3]		
M9048A	PCIe host adapter: Gen 2, x8	
M9048B	PCIe host adapter: single port (x8), Gen 3	
M9049A	PCIe host adapter: dual port (x16), Gen 3	
Y1202A	PCIe cable	
M9021A [4]	PCIe cable interface: Gen 2, x8	
M9022A	PXIe system module: single port (x8), Gen 3	
M9023A	PXIe system module: dual port (x16), Gen 3	
M9024A	PXIe system module with connectivity expansion: dual port (x16) Gen 3	

1. The M9018B or M9019A 18-slot chassis includes empty space to the left of the 1st functional slot. The embedded controller occupies that empty space and the 1st functional slot.
2. For list of qualified external controllers, please see Test Computer List Technical Note literature no. 5990-7632EN.
3. For more detailed chassis configuration information including multi-chassis, see Interface Modules and Adapters for PXIe and AXIe Systems literature no. 5992-0377EN.
4. The M9021A can only be used with the Keysight M9018B.

PC requirements for M9416A PXIe vector transceiver control [1]

Functions	Description
Operating system	Windows 10 (64 bit)
Processor speed	1.86 GHz dual core minimum
Available memory	8 GB minimum
	16 GB recommended
Available disk space on Drive C	16 GB minimum
	Additional 24 GB required for each application

D. Select a chassis and accessories

Step 1. Select a chassis		
M9010A	10-slot PXIe chassis	
M9018B	18-slot PXIe chassis Gen 2	
M9019A	18-slot PXIe chassis Gen 3	
Step 2. Choose enough slot blocker kits and EMC filler panels to fill every open slot		
Y1212A	Slot blocker kit: 5 slots	
Y1213A	PXI EMC filler panel kit: 5 slots	
	Non-EMC filler panels are included with the M9018B or M9019A PXIe 18-slot chassis.	

1. For list of qualified external controllers, please see Test Computer List Technical Note literature number 5990-7632EN.

Step 3. Choose a rack mount kit [1] (optional)		
Y1271A	Rack mount kit for M9010A and Y1217A rail kit	
Y1215C	Rack mount kit for M9018B or M9019A 18-slot PXIe chassis	
Y1216B	Rack mount kit for M9018B or M9019A 18-slot PXIe chassis	
Step 4. Choose an air inlet kit [2] (optional)		
Recommended for rack mounted systems with less than 1U space below chassis.		
Y1214B	Air inlet kit	
Step 5. Choose connecting cable		
Y1810A	Cable, MMPX male to SMB male, 260 mm	
Y1811A	Cable, MMPX male to MMPX male, 200 mm	
Y1812A	Cable, MMPX male to SMB male, 500 mm	
Y1813A	Cable, MMPX male to SMB male, 1000 mm	
Y1814A	Cable, SMA male to SMA male, 1220 mm	
Y1815A	Cable, MMPX male to BNC male, 1500 mm	
Y1818A	Cable, MMPX male right angle to SMA female, 500 mm	
Y1819A	PXIe storage module, 4TB	
Y1819B	PXIe storage module, 8TB	

1. For more information on the rack mount kit, see the chassis data sheet, literature number 5992-1481EN.
2. For more information, please visit www.keysight.com/find/m9019a.

Software

E. Select measurement applications or software and license type for VXT PXIe vector transceiver

Step 1. Start with M9416A base configuration

The VXT comes standard with the following software:

- Keysight IO Libraries Suite including Connection Expert [1]
- Drivers for use with Visual Studio (including VB Net, C#, C/C++), Keysight VEE
- Sample waveforms and programming examples

Step 2. Add X-Series measurement applications (optional)

Measurement applications that start with the prefix "N" are measurement only applications and require waveform pack licenses for waveform playback. Applications that start with the prefix "Y" combine measurement applications with unlimited waveform playback capability.

Keysight offers 4 license types for the measurement applications. Each of the following license types are offered as perpetual or subscription. Visit www.keysight.com/find/ X-Series_apps for more information.

- Node-locked: Allows you to use the license on one specified instrument or computer.
- Transportable: Allows you to move the license from one instrument or computer to another using Keysight's online tool.
- USB portable: Allows you to move the license from one instrument or computer to another with a certified USB dongle.
- Floating: Allows you to access the license on networked instruments or computers from a server, one at a time.

Model name	Description
N9085EM0E	5G NR measurement application
Y9085EM0E	5G NR non-signaling waveform and measurement application
N9080EM0E	LTE and LTE-Advanced FDD measurement application
Y9080EM0E	LTE and LTE-Advanced FDD waveform and measurement application
N9082EM0E	LTE and LTE-Advanced TDD measurement application
Y9082EM0E	LTE and LTE-Advanced TDD waveform and measurement application
N9073EM0E	W-CDMA/HSPA+ measurement application
Y9073EM0E	W-CDMA/HSPA+ waveform and measurement application
N9077EM0E	WLAN 802.11a/b/g/j/p/n/af/ah measurement application
Y9077EM0E	WLAN 802.11a/b/g/j/p/n/af/ah waveform and measurement application
N9077EM1E	WLAN 802.11ac/ax measurement application
Y9077EM1E	WLAN 802.11ac/ax waveform and measurement application
N9077EM2E	WLAN 802.11be measurement application
Y9077EM2E	WLAN 802.11be waveform and measurement application
N9081EM0E	*Bluetooth*® measurement application
Y9081EM0E	*Bluetooth* waveform and measurement application
N9084EM0E	Short range communications and IoT measurement application
Y9084EM0E	Short range communications waveform and measurement application
N9065EM1E	Sequence analyzer device application
N9056EM0E	Channel Quality Measurement Application
N9056EM1E	Channel Quality for Noise Power Ratio Measurement Application

1. Both IO library (version 18.1 or newer) and Connection Expert software need to be installed on the PC controlling the PXI instruments. To download, visit www.keysight.com/find/iosuite.

Step 3. Add Signal Studio software [1] (optional)	
Generate standard-compliant test signals validated by Keysight for receiver and component test.	
Model name	**Description**
N7606EMBC	Signal Studio for *Bluetooth*, waveform playback
N7617EMBC	Signal Studio for WLAN 802.11, waveform playback
N7610EMBC	Signal Studio for IoT, waveform playback
N7600EMBC	Signal Studio for W-CDMA/HSPA+, waveform playback
N7624EMBC	Signal Studio for LTE/LTE-Advanced/LTE-A Pro FDD, waveform playback
N7625EMBC	Signal Studio for LTE/LTE-Advanced TDD, waveform playback
N7631EMBC	Signal Studio Pro for 5G NR, waveform playback
N7650B[2]	5/50 pack Signal Studio Waveform Licenses

1. For more information, see Signal Studio brochure, literature number 5989-6448EN

F. Calibration, start-up assistance

Model name	Description	Additional information
M9416A-UK6	Commercial calibration certificate with test data	Calibration certificate with measurement results available only at time of purchase.
M9300A-UK6	Commercial calibration certificate with test data for M9300A	Calibration certificate with measurement results available only at time of purchase.
PS-S20-01	Service: 1-day start-up assistance	Training on how to operate your instrument effectively
R-50C-011-3	Calibration Assurance Plan - Return to Keysight, 3 years	
R-50C-011-5	Calibration Assurance Plan - Return to Keysight, 5 years	
R-50C-011-7	Calibration Assurance Plan - Return to Keysight, 7 years	
R-50C-011-10	Calibration Assurance Plan - Return to Keysight, 10 years	

Global warranty

Keysight provides the peace of mind that today's high-tech industry requires. Your investment is protected by Keysight's global reach in more than 100 countries (either directly or through distributors). The warranty gives you convenient standard coverage for the country in which the product is used, eliminating the need to ship equipment back to the country of purchase. Keysight's warranty service provides:

- All parts and labor necessary to return your investment to full specified performance
- Recalibration for products supplied originally with a calibration certificate
- Return shipment

One day start-up assistance

A Keysight Technologies applications engineer will get you started quickly by helping you install the modules in a chassis, configure the controller, load software and start making measurements.

Calibration services

The modular products are factory calibrated and shipped with an ISO-9002, NIST- traceable calibration certificate. A one-year calibration cycle is recommended.

Using a Non-Keysight Chassis

The M9416AVXT PXIe vector transceiver can be successfully installed in a non-Keysight PXI chassis. Please use the following guidelines.

- Ensure that the chassis has enough consecutive PXIe or PXI-H slots to accommodate the M9416A.
- Ensure that the chassis and controller support peer-to-peer PXI Express I/O switch topology.
- Ensure that controller selected is compatible with chassis.

Please contact your Keysight representative for more detailed information. For technical assistance with non-Keysight equipment, please refer to the equipment manufacturer's website.

Related Literature

For more detailed product and specification information refer to the following literature and web pages:

Publication title	Publication number
M9416A VXT Transceiver – Data Sheet	3122-2221EN
M9018B and M9019A PXIe 18-slot chassis - Data Sheet	5992-1481EN
M9035A PXIe Embedded Controller - Data Sheet	3121-1327EN
M9038A PXIe Embedded Controller - Data Sheet	3122-1717EN
X-Series Measurement Applications - Brochure	5989-8019EN
Simplify Signal Creation with Signal Studio Software - Brochure	5989-6448EN