M9415A VXT PXIe Vector Transceiver

380 MHz to 12 GHz

Overview

This configuration guide contains information to help you configure your M9415A VXT PXIe vector transceiver to meet your requirements. Ordering optional capabilities at time of purchase provides the lowest overall cost.

KEYSIGHT TECHNOLOGIES

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		
M9415A-001	VXT PXIe vector transceiver	
Step 2. Choose maximum frequency range		
M9415A-F06	Frequency range, 380 MHz to 6 GHz	
M9415A-F08	Frequency range, 380 MHz to 8 GHz	
M9415A-F12	Frequency range, 380 MHz to 12 GHz	
Step 3. Choose modulation and analysis bandwidth		
M9415A-B4X	400 MHz bandwidth	Included in base configuration
M9415A-B8X	800 MHz bandwidth	
M9415A-B12	1.2 GHz bandwidth	
Step 4. Choose memory size		
M9415A-M02	256 MSa	Included in base configuration
M9415A-M05	512 MSa	
Step 5. Add high output power		
M9415A-1EA	High output power	
Step 6. Add duplex port		
M9415A-HDX	Half duplex port	

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
		One 10 MHz output
M9300A-S01[1]		Internal 10 MHz OCXO timebase output

1. No export license agreement

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

Step 1. Select embedded controller [1]	
M9037A-M08 High-performance embedded controller Intel i7-4700EQ quad-core processor, 2.4 GHz, 8-thread, 8 GB RAM Select M9037A 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 x8 connector from front for connection to second chassis	

Step 2. Upgrade from standard memory size (Optional)	
M9037A-M16	Memory upgrade to 16 GB RAM
16 GB RAM is required for LTE or 5G NR measurement	

Step 3. Select an operating system	
M9037A-W16	Microsoft Windows 10 IoT Enterprise LTSB (64-bit)

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.

C. Select controller (Either embedded controller or via PC) (Continued)

PC requirements for M9415A 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	8 GB

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		
Recommended to achieve data sheet specifications		
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.

D. Select a chassis and accessories (Continued)

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: M9018B or M9019A 18-slot chassis [2]	

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

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/m9018b** and **www.keysight.com/find/m9019a.**

Software

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

Step 1. Start with M9415A 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 time-based. 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
N9054EM0E	VMA Vector Modulation Analysis Measurement Application
N9054EM1E	Vector Modulation Analysis Custom OFDM 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
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
N9085EM0E	5G NR Measurement Application
Y9085EM0E	5G NR Waveform and 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**
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
N7617EMBC	Signal Studio for WLAN 802.11, waveform playback
N7608EMBC	Signal Studio Pro for Custom Modulation, waveform playback
N7630EMBC	Signal Studio Pro for Pre-5G, waveform playback
N7631EMBC	Signal Studio Pro for 5G NR, waveform playback
N7609EMBC	Signal Studio for Global Navigation Satellite System (GNSS), waveform playback
N7650B	5/50 pack Signal Studio Waveform Licenses

Step 4. Add 89600 VSA software (Optional)	
89600 vector signal analysis (VSA) software	Industry-leading measurement software for evaluating and troubleshooting signals in R&D; PC-based software supporting more than 30 measurement platforms, plus more than 75 signal standards and modulation types including MIMO analysis; **www.keysight. com/find/89600_VSA**

F. Calibration, start-up assistance

Model name	Description	Additional information
M9415A-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	

1. For more information, see Signal Studio brochure, literature number 5989-6448EN or Signal Studio configuration assistant at **http://rfmw.em.keysight.com/wireless/helpfiles/all-in-one_config_asst/ssconfig.html**.

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.

Upgrading Your System

Your product can be easily upgraded after the initial purchase. Fast license-key upgrades for performance options that do not require additional hardware:

1. Contact your Keysight representative to place an order for an option upgrade.
2. You will receive your hardware entitlement certificate via email.
3. Redeem the certificate online by following the instructions provided to receive a license key file.
4. Install the license key file using the Keysight License Manager.
5. Begin using the new capability[1,2].

Description	Upgrade number
Bandwidth upgrade, 400 MHz to 800 MHz	M9415AU-B8X
Bandwidth upgrade, 400 MHz to 1.2 GHz	M9415AU-B12
Bandwidth upgrade, 800 MHz to 1.2 GHz	M9415AU-BU2
Memory upgrade, 256 MSa to 512 MSa	M9415AU-M05
Add high output power	M9415AU-1EA
Add half duplex port	M9415AU-HDX

Using a Non-Keysight Chassis

The M9415AVXT 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 M9415A.
- 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.

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1. At the time of manufacture, the hardware related to many of these options was fully adjusted and the option performance was verified to be within its warranted specifications. Within one year of the initial calibration date of the analyzer, this option is fully calibrated with no further adjustment or verification testing.

2. If this transceiver has been adjusted as part of a repair or calibration during its first year, or if the transceiver is more than one-year old, additional adjustment and performance verification tests are required to ensure that some newly installed options are functioning properly. However, the completion of these tests does not guarantee that the transceiver meets all warranted specifications.

Related Literature

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

Publication title	Publication number
M9018B and M9019A PXIe 18-slot chassis - Data Sheet	5992-1481EN
M9037A PXIe Embedded Controller - Data Sheet	5991-3661EN
X-Series Measurement Applications - Brochure	5989-8019EN
Simplify Signal Creation with Signal Studio Software - Brochure	5989-6448EN

Learn more at: www.keysight.com

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