

# PXI Vector Network Analyzer

M9370A 300 kHz to 4 GHz

M9371A 300 kHz to 6.5 GHz

M9372A 300 kHz to 9 GHz

M9373A 300 kHz to 14 GHz

M9374A 300 kHz to 20 GHz

M9375A 300 kHz to 26.5 GHz



# Drive Down the Size of Test

This configuration guide describes standard configurations, options, accessories, upgrade kits and compatible peripherals for the M937xA PXIe vector network analyzer (VNA). This guide should be used with the Keysight PXI VNA data sheet for a complete description of these analyzers.

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## A. Select Options for M937xA PXIe VNA

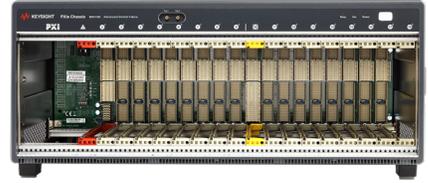
<b>Step 1. Start by choosing the frequency range of the M937xA PXIe VNA</b>	
M9370A	300 kHz to 4 GHz
M9371A	300 kHz to 6.5 GHz
M9372A	300 kHz to 9 GHz
M9373A	300 kHz to 14 GHz
M9374A	300 kHz to 20 GHz
M9375A	300 kHz to 26.5 GHz
<b>Step 2. Add automatic fixture removal capability (optional)</b>	
M937xA-007	Automatic fixture removal
<b>Step 3. Add frequency offset mode and scalar calibrated converter measurement capability (optional)</b>	
M937xA-009	Frequency offset mode and scalar calibrated converter measurement
<b>Step 4. Add time domain capability (optional)</b>	
M937xA-010	Time domain
<b>Step 5. Add full N-port correction capability (optional)</b>	
M937xA-551	N-port calibrated measurement <sup>1</sup>
<b>Step 6. Add multiport cable kit (optional)</b>	
Y1242A	Multiport cable kit Includes 2 SMB cables and 1 SMA cables for connecting 2 modules together Add one multiport cable kit for each additional 2-port VNA
<b>Step 7. Add multiport accessory and tool kit (optional)</b>	
Y1281A	Accessory and tool kit Includes the following tools for SMA and SMB connector removal: <ul style="list-style-type: none"> <li>- 5002-3361 Pull tool for SMB connectors</li> <li>- 5023-1450 Custom long deep socket for 3.5/SMA</li> <li>- Connector nuts</li> </ul>
<b>Step 8. Add application software (optional)</b>	
Automated Measurement Expert (AMX)	A smart software solution for automated multiport S-parameter measurements with the M937xA. Order each software model and install in a PC or the embedded controller.
S94701A <sup>2</sup> , S94702A <sup>2</sup> , KS8400A <sup>2</sup>	

1. When ordering multiple VNA modules Option Y1242A is recommended for each additional multiport interconnection.  
2. Supported software license types: fixed-perpetual, transportable-perpetual, fixed-1-year, and transportable-1-year

## B. Select Chassis and Accessories

### Step 1. Select a chassis

M9005A	5-slot PXIe 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
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Y1213A	PXI EMC filler panel kit: 5 slots Non-EMC filler panels are included with the M9018B or M9019A PXIe 18-slot chassis
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### Step 3. Choose a rack mount kit (optional) <sup>1</sup>

Y1274A	Rack mount kit for M9005A
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 <sup>2</sup> (optional)

Recommended for rack mounted systems with less than 1U space below chassis

Y1214B	Air inlet kit: M9018B or M9019A 18-slot chassis
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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](http://www.keysight.com/find/m9018b)

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

### Step 1. Select controller for M9005A

If you have selected the M9005A chassis, you must order Option M9005A-002 and use an external controller. Embedded controllers are not supported in the M9005A.



### Step 2. Select embedded controller <sup>1</sup>

M9037A High-performance embedded controller, Gen 3

Intel i7-4700EQ quad-core processor, 2.4 GHz, 8 thread, 4 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 PCIe® connector on front for connection to second chassis.



### Step 3. Upgrade from standard memory size (optional)

M9037A-M08 Memory upgrade from 4 GB to 8 GB RAM (Win 7, 64-bit only)

M9037A-M16 Memory upgrade from 4 GB to 16 GB RAM (Win 7, 64-bit only)

### Step 4. Select an operating system

M9037A-WE3 Microsoft Windows Embedded Standard 7 (32-bit)

M9037A-WE6 Microsoft Windows Embedded Standard 7 (64-bit)

M9037A-W16 Microsoft Windows 10 IoT Enterprise LTSB (64-bit)



1. The M9010A 10-slot chassis or M9018B/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.

## D. To Use Your Desktop PC as a Controller <sup>1, 2</sup>

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M9048A	PCIe Host Adapter: Gen 2, x8
M9048B	PCIe Host Adapter: Single Port (x8), Gen 3
M9049A	PCIe Host Adapter: Single Port (x16), Gen 3

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Y1202A	PCIe cable
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M9021A <sup>3</sup>	PCIe Cable Interface: Gen 2, x8
M9022A	PXIe System Module: Single Port (x8), Gen 3
M9023A	PXIe System Module: Single Port (x16), Gen 3
M9024A	PXIe System Module with Connectivity Expansion: Dual Port (x16) Gen 3

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1. For list of qualified external controllers, please see Test Computer List Technical Note literature number 5990-7632EN.
2. For more detailed chassis configuration information including multi-chassis, see Interface Modules and Adapters for PXIe and AXIe Systems literature number 5992-0377EN.
3. The M9021A can only be used with the Keysight M9018B.

## E. Select Software for M937xA PXIe VNA

### Step 1. Start with M937xA base configuration

The M937xA comes standard with the following software: [Keysight IO Libraries Suite including Connection Expert](#) <sup>1</sup>  
[Instrument software, soft front panel, drivers for use with Matlab, LabVIEW, Visual Studio \(including VB Net, C#, C/C++\)](#), [Keysight VEE](#) <sup>2</sup>  
[Programming examples](#)

### Step 2. Download free Keysight Command Expert software <sup>3</sup> (optional)

**FREE software that provides fast and easy instrument control for the PC. Command Expert combines instrument command sets, command sequences, documentation, syntax checking, and command execution in one simple interface. Command Expert helps you to:**

Find instrument commands

Access command documentation

Verify command syntax

Build instrument command sequences

Execute instrument command sequences

Integrate sequences in MATLAB, Visual Studio, Excel, LabVIEW, Keysight VEE or Keysight SystemVue PC application environment

Generate code for command sequences in MATLAB, Visual C#, Visual Basic.NET and Visual C/C++

Profile command execution time

Debug command sequences using breakpoints and single stepping

1. Both IO library (version 16.3 or newer) and Connection Expert software need to be installed on the PC controlling the equipment.
2. To download, visit [www.keysight.com/find/iosuite](http://www.keysight.com/find/iosuite)
3. Find latest versions of this software at [www.keysight.com/find/pxivna](http://www.keysight.com/find/pxivna)
4. To download or get more information on Command Expert, visit [www.keysight.com/find/commandexpert](http://www.keysight.com/find/commandexpert)

## F. Select Services: Calibration, Start-up Assistance

		Description
M937xA -UK6	Commercial calibration certification with test data	Complete set of measurements which tests unit to manufacturer's published specifications. Includes calibration label, calibration certificate, and data report. Conforms to ISO 9001
M937xA -1A7	RISO 17025 compliant calibration	Complete set of measurements which tests unit to manufacturer's published specifications. Includes calibration label, ISO 17025 calibration certificate, and data report, measurement uncertainties and guardbands on all customer specifications. Conforms to ISO 17025 and ISO 9001
M937xA -A6J	ANSI Z540 compliant calibration	Complete set of measurements which tests unit to manufacturer's published specifications. Includes pre- and post-adjustment data with measurement uncertainty information compliant to the ANSI/NCSL Z540 standard.
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	

### Documentation

The PXI VNA is equipped with a Soft Front Panel help system in English only. This context-sensitive help is available in the software and on the CD. All PXI VNA documentation is available at: <http://na.support.keysight.com/pxivna/help>

### 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. The M937xA PXIe VNA is supported by the Keysight N7800A Calibration Software to perform calibrations that test all product specifications and is compliant with ISO 17025:2005, ANSI/NCSL Z540.3-2006 and Measurement Uncertainty per ISO Guide to Expression of Measurement Uncertainty 1995.

### N7800A calibration and adjustment software

The M937xA PXIe VNA is supported by Keysight's calibration and adjustment software. This is the same software used at Keysight's service centers to automate calibration. The software offers compliance tests for ISO 17025:2005, ANSI/NCSL Z540.3-2006, and measurement uncertainty per ISO Guide to Expression of Measurement Uncertainty.

Product Information: [www.keysight.com/find/contactus](http://www.keysight.com/find/contactus)  
Or call: **1 800 829-4444 US**  
Repair and Calibration: [www.keysight.com/find/infoline](http://www.keysight.com/find/infoline)  
Parts and Accessories: [www.parts.keysight.com](http://www.parts.keysight.com)  
Email Updates: [www.keysight.com/find/emailupdate](http://www.keysight.com/find/emailupdate)  
For all modular products: [www.keysight.com/find/modular](http://www.keysight.com/find/modular)

1. Additional hardware required. Please refer to the analyzer's Service Guide for required service test equipment.

## G. Measurement Accessories

A complete list of RF and microwave test accessories is available on our web site: [www.keysight.com/find/mta](http://www.keysight.com/find/mta).

Accessories are available in these connector types: 50 ohm Type-N, 3.5 mm, 7 mm, and waveguide. Test port cables and a calibration kit should be added for a complete measurement system. A verification kit is used to verify corrected system performance.

### Cables and adapter sets

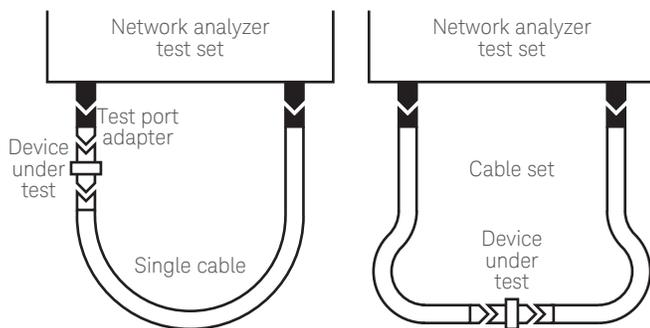
Keysight offers cables in the following types:

- Single cables in semi-rigid and flexible
- Cable sets in semi-rigid and flexible

There are also adapter sets available that protect the test port and convert the port to the desired connector interface. These kits contain:

- One male adapter
- One female adapter

To attain the best mechanical rigidity for device connection, use a single cable and the appropriate special adapter set. To attain the greatest flexibility for device connection, use a cable set.



### Calibration kits

#### Coaxial measurements

Mechanical calibration kits include standards, such as opens, shorts and loads, which are measured by the network analyzer for increased measurement accuracy.

Electronic calibration (ECal) kits replace mechanical calibration standards with one solid-state calibration module that is controlled by the network analyzer via USB, to present many different impedances to the test ports. A full two-port calibration can be performed quickly with a single connection. This technique reduces operator errors and connector wear and abrasion.

Choose a calibration kit for each connector type to be used.

**Economy**, includes:

- Open standards (male and female)
- Short standards (male and female)
- Fixed-termination standards (male and female)

**Standard**, includes the devices in the economy kit and adds:

- Sliding load standards (male and female) or a series of offset shorts

**Precision**, includes the devices in the economy kit and adds:

- 50 ohm airline(s) for TRL calibration
- TRL adapters

#### Waveguide measurements

For waveguide measurements, Keysight offers mechanical calibration kits that include:

- Waveguide-to-coax adapters (X, P, K)
- Precision waveguide section
- Flush short circuit
- Fixed terminations
- Straight section

## For devices with 3.5 mm or SMA connectors

### Mechanical calibration kits

- **85052B** Standard, DC to 26.5 GHz  
Includes:
  - 00902-60003 3.5 mm (m) fixed load
  - 00902-60004 3.5 mm (f) fixed load
  - 00911-60019 3.5 mm (m) sliding load
  - 00911-60020 3.5 mm (f) sliding load
  - 85052-60006 3.5 mm (m) short
  - 85052-60007 3.5 mm (f) short
  - 85052-60008 3.5 mm (m) open
  - 85052-60009 3.5 mm (f) open
  - 85052-60012 3.5 mm (f) to 3.5 mm (f) adapter
  - 85052-60013 3.5 mm (f) to 3.5 mm (m) adapter
  - 85052-60014 3.5 mm (m) to 3.5 mm (m) adapter
- **85052C** Precision TRL, DC to 26.5 GHz  
Includes:
  - 00902-60003 3.5 mm (m) fixed load
  - 00902-60004 3.5 mm (f) fixed load
  - 85052-60006 3.5 mm (m) short
  - 85052-60007 3.5 mm (f) short
  - 85052-60008 3.5 mm (m) open
  - 85052-60009 3.5 mm (f) open
  - 85052-60032 3.5 mm (f) to 3.5 mm (f) adapter
  - 85052-60033 3.5 mm (m) to 3.5 mm (m) adapter
  - 85052-60034 3.5 mm (f) to 3.5 mm (m) adapter
  - 85052-60035 3.5 mm short TRL line
  - 85052-60036 3.5 mm long TRL line
- **85052D** Economy, DC to 26.5 GHz  
Includes:
  - 00902-60003 3.5 mm (m) fixed load
  - 00902-60004 3.5 mm (f) fixed load
  - 85052-60006 3.5 mm (m) short
  - 85052-60007 3.5 mm (f) short
  - 85052-60008 3.5 mm (m) open
  - 85052-60009 3.5 mm (f) open
  - 85052-60012 3.5 mm (f) to 3.5 mm (f) adapter
  - 85052-60013 3.5 mm (f) to 3.5 mm (m) adapter
  - 85052-60014 3.5 mm (m) to 3.5 mm (m) adapter

### Electronic calibration kits

- **N7550A** economy ECal, DC to 4 GHz, 2-ports
- **N7551A** economy ECal, DC to 6.5 GHz, 2-ports
- **N7552A** economy ECal, DC to 9 GHz, 2-ports
- **N7553A** economy ECal, DC to 14 GHz, 2-ports
- **N7554A** economy ECal, DC to 18 GHz, 2-ports
- **N7555A** economy ECal, DC to 26.5 GHz, 2-ports
- **N755xA Series** includes:
  - Option 3MF with 3.5 mm (m) to 3.5 mm (f) ECal module
  - Option 3MM with 3.5 mm (m) to 3.5 mm (m) ECal module
  - Option 3FF with 3.5 mm (f) to 3.5 mm (f) ECal module
- **85093C RF ECal**, 300 kHz to 9 GHz, 2-ports
  - Standard module includes

- **Option M0F** with:
  - 85093-60008 3.5 mm (f) to 3.5 mm (m) ECal module
- **Option 00F** module with:
  - 85093-60010 3.5 mm (f) to 3.5 mm (f) ECal module
- **Option 00M** module with:
  - 85093-60009 3.5 mm (m) to 3.5 mm (m) ECal module
- **Option 00A** adds:
  - 85052-60012 3.5 mm (f) to 3.5 mm (f) adapter
  - 85052-60014 3.5 mm (m) to 3.5 mm (m) adapter

#### 85093C-xxx mixed-connector options

Port A option			Port B option					
Type	(f)	(m)	Type	(f)	(m)	Type	(f)	(m)
3.5 mm	101	102	Type-N	203	204	7-16	205	206
			50 ohm					

- **N4431B** Microwave ECal, 300 kHz to 13.5 GHz, 4-ports  
Includes:
  - **Option 010** module with:
    - N4431-60006 4 x 3.5 mm (f) ECal module

#### N4431B-xxx mixed-connector options

Connector	Port A	Port B	Port C	Port D
Type	Option	Option	Option	Option
3.5 mm (f)	101	201	301	401
3.5 mm (m)	102	202	302	402
Type-N 50 ohm (f)	103	203	303	403
Type-N 50 ohm (m)	104	204	304	404
7-16 (f)	105	205	305	405
7-16 (m)	106	206	306	406

- **N4433A** Microwave ECal, 300 kHz to 20 GHz, 4-ports  
Includes:
  - **Option 010** module with:
    - N4433-60003 4 x 3.5 mm (f) ECal module

#### N4433A-xxx mixed-connector options

Connector	Port A	Port B	Port C	Port D
Type	Option	Option	Option	Option
3.5 mm (f)	101	201	301	401
3.5 mm (m)	102	202	302	402

- **N4691B** Microwave ECal, 300 kHz to 26.5 GHz, 2-ports  
Includes:
  - **Option M0F** module with:
    - N4691-60004 3.5 mm (f) to 3.5 mm (m) ECal module
  - **Option 00M** module with:
    - N4691-60005 3.5 mm (m) to 3.5 mm (m) ECal module
  - **Option 00F** module with:
    - N4691-60006 3.5 mm (f) to 3.5 mm (f) ECal module
  - **Option 00A** adds:
    - 85052-60012 3.5 mm (f) to 3.5 mm (f) adapter
    - 85052-60014 3.5 mm (m) to 3.5 mm (m) adapter

## For devices with Type-N connectors

- **N4691D**<sup>1</sup> Microwave ECal: DC or 300 kHz to 26.5 GHz, 2-ports  
Includes:
  - **Option F0F:**  
Both connectors are 3.5 mm female on module
  - **Option M0F:**  
1 female and 1 male 3.5 mm connector on module
  - **Option M0M:**  
Both connectors are 3.5 mm male on module
  - **Option 0DC:** DC to 26.5 GHz
  - **Option 003:** 300 kHz to 26.5 GHz
  - **Option 00A** adds:  
85052-60012 3.5 mm (f) to 3.5 mm (f) adapter  
85052-60014 3.5 mm (m) to 3.5 mm (m) adapter

## Mechanical calibration kits

- **85054B** Standard, DC to 18 GHz  
Includes:
  - 00909-60011 Type-N (m) fixed lowband load
  - 00909-60012 Type-N (f) fixed lowband load
  - 85054-60025 Type-N (m) short
  - 85054-60026 Type-N (f) short
  - 85054-60027 Type-N (m) open
  - 85054-60028 Type-N (f) open
  - 85054-60031 Type-N (f) to 7mm adapter
  - 85054-60032 Type-N (m) to 7mm adapter
  - 85054-60037 Type-N (f) to Type-N (f) adapter
  - 85054-60038 Type-N (m) to Type-N (m) adapter
  - 85054-80010 Type-N (f) sliding load
  - 85054-80009 Type-N (m) sliding load
  - 85054-60050 Type-N (f) connector gage
  - 85054-60052 Type-N (f) gage master
  - 85054-60051 Type-N (m) connector gage
  - 85054-60053 Type-N (m) gage master
- **85054D** Economy, DC to 18 GHz  
Includes:
  - 85054-60025 Type-N (m) short
  - 85054-60026 Type-N (f) short
  - 85054-60027 Type-N (m) open
  - 85054-60028 Type-N (f) open
  - 85054-60031 Type-N (f) to 7mm adapter
  - 85054-60032 Type-N (m) to 7mm adapter
  - 85054-60037 Type-N (f) to Type-N (f) adapter
  - 85054-60038 Type-N (m) to Type-N (m) adapter
  - 85054-60046 Type-N (m) fixed load
  - 85054-60047 Type-N (f) fixed load

## Electronic calibration kits

- **N7550A** economy ECal, DC to 4 GHz, 2-ports
- **N7551A** economy ECal, DC to 6.5 GHz, 2-ports
- **N7552A** economy ECal, DC to 9 GHz, 2-ports
- **N7553A** economy ECal, DC to 14 GHz, 2-ports
- **N7554A** economy ECal, DC to 18 GHz, 2-ports
- **N755xA Series** includes:
  - Option NMF with Type-N (m) to Type-N (f) ECal module
  - Option NMM with Type-N (m) to Type-N (m) ECal module
  - Option NFF with Type-N (f) to Type-N (f) ECal module

- **N4431B** Microwave ECal, 300 kHz to 13.5 GHz, 4-ports  
Includes:
  - Option 020 module with:
  - N4431-60007 4 x Type-N (f) ECal module

### N4431B-xxx mixed-connector options

Connector	Port A	Port B	Port C	Port D
Type	Option	Option	Option	Option
3.5 mm (f)	101	201	301	401
3.5 mm (m)	102	202	302	402
Type-N 50 ohm (f)	103	203	303	403
Type-N 50 ohm (m)	104	204	304	404
7-16 (f) <sup>1</sup>	105	205	305	405
7-16 (m) <sup>1</sup>	106	206	306	406

1. Limits ECal module high frequency to 7.5 GHz

- **N4432A** Microwave ECal, 300 kHz to 18 GHz, 4-ports  
Includes:
  - **Option 020** module with:
  - N4432-60003 4 x Type-N (f) ECal module

### N4432A-xxx mixed-connector options

Connector	Port A	Port B	Port C	Port D
Type	Option	Option	Option	Option
3.5 mm (f)	101	201	301	401
3.5 mm (m)	102	202	302	402
Type-N 50 ohm (f)	103	203	303	403
Type-N 50 ohm (m)	104	204	304	404

- **N4690B** Microwave ECal, 300 kHz to 18 GHz, 2-ports  
Includes:
  - **Option M0F** module with:  
N4690-60004 Type-N (f) to Type-N (m) ECal module
  - **Option 00M** module with:  
N4690-60005 Type-N (m) to Type-N (m) ECal module
  - **Option 00F** module with:  
N4690-60006 Type-N (f) to Type-N (f) ECal module
  - **Option 00A** adds:  
85054-60037 Type-N (f) to Type-N (f) adapter  
85054-60038 Type-N (m) to Type-N (m) adapter
- **N4690D**<sup>1</sup> Microwave ECal: DC or 300 kHz to 18 GHz, 2-ports  
Includes:
  - **Option F0F:**  
Both connectors are Type-N 50 Ω female on module
  - **Option M0F:**  
1 female and 1 male Type-N 50 Ω connector on module
  - **Option M0M:**  
Both connectors are Type-N 50 Ω male on module
  - **Option 0DC:** DC to 18 GHz
  - **Option 003:** 300 kHz to 18 GHz
  - **Option 00A** adds:  
85054-60037 Type-N (f) to Type-N (f) adapter  
85054-60038 Type-N (m) to Type-N (m) adapter

1. The M937xA must have firmware revision A.12.60 or above for the operation with the N469xD series ECal.

## For devices with 7 mm connectors

### Mechanical calibration kits

- **85050B** Standard, DC to 18 GHz  
Includes:
  - 00909-60008 7 mm coax termination
  - 85050-60006 7 mm fixed broadband load
  - 85050-80007 7 mm short
  - 85050-80010 7 mm open
  - 85050-80011 7 mm sliding load
- **85050C** Precision TRL, DC to 18 GHz  
Includes:
  - 00909-60008 7 mm coax termination
  - 85050-60003 7 mm to 7 mm airline
  - 85050-60005 7 mm to 7 mm TRL adapter
  - 85050-60006 7 mm fixed broadband load
  - 85050-80008 7 mm short
  - 85050-80009 7 mm short collet
  - 85050-80010 7 mm open
- **85050D** Economy, DC to 18 GHz  
Includes:
  - 85050-60006 7 mm fixed broadband load
  - 85050-80007 7 mm short
  - 85050-80010 7 mm open

### Electronic calibration kits

- **N4696B** Microwave ECal, 300 kHz to 18 GHz, 2-ports, 7 mm to 7 mm microwave module
- **N4696D**<sup>1</sup> Microwave ECal: DC or 300 kHz to 18 GHz, 2-ports, 7 mm connectors.  
Includes:
  - **Option 0DC**: DC to 18 GHz
  - **Option 003**: 300 kHz to 18 GHz

1. The M937xA must have firmware revision A.12.60 or above for the operation with the N469xD series ECal.

## For devices with waveguide

### Mechanical calibration kits

#### X Band

- **X11644A** Standard WR-90, 8.2 to 12.4 GHz  
Includes:
  - 00896-60008 X-band standard section
  - 00910-60003 X-band termination
  - 11644-20018 X-band short
  - 11644-20021 X-band shim

#### P-Band

- **P11644A** Standard WR-62, 12.4 to 18 GHz  
Includes:
  - 00896-60007 P-band standard section
  - 00910-60002 P-band termination
  - 11644-20017 P-band short
  - 11644-20020 P-band shim

#### K-Band

- **K11644A** Standard WR-42, 18 to 26.5 GHz  
Includes:
  - 00896-60006 K-band standard section
  - 00910-60001 K-band termination
  - 11644-20016 K-band short
  - 11644-20019 K-band shim

### Verification kits

All Keysight verification kits include:

- Precision Z0 airline or match thru
- Mismatched airline or mismatch thru
- Fixed attenuators
- Traceable measured data and uncertainties
- **85051B** 45 MHz to 18 GHz 7 mm kit  
Includes attenuators, airline and mismatch airline with data on a 3.5-inch disk for use in confirming accuracy enhanced system measurement performance, traceable to national standards. Test procedure is provided in the service manual.
- **85053B** 300 kHz to 26.5 GHz 3.5 mm kit  
Includes attenuators, airline and mismatch airline with data on a 3.5-inch disk for use in confirming accuracy enhanced system measurement performance, traceable to national standards. Test procedure is provided in the service manual.
- **85055A** 300 kHz to 18 GHz Type-N kit  
Includes attenuators, airline and mismatch airline with data on a 3.5-inch disk for use in confirming accuracy enhanced system measurement performance, traceable to national standards. Test procedure is provided in the service manual.

## H. Example Configurations

Please see the M937xA Startup Guide literature number M9370-90001 for detailed cabling diagram and parts list.

### Single 2-port M937xA PXIe VNA



### Multiport Measurement Configurations

The Keysight PXI VNA is an ideal solution for multiport measurements. The PXI VNA has a two-port (two reference receivers and two test receivers) architecture in a one-slot module. It can be easily configured as a true multiport VNA by using additional modules installed in the same chassis. The true multiport VNA has no degradation in performance (i.e. dynamic range, trace noise, directivity,...) due to external switches. The PXI VNA supports full N-port correction capability when configured as a multiport VNA.

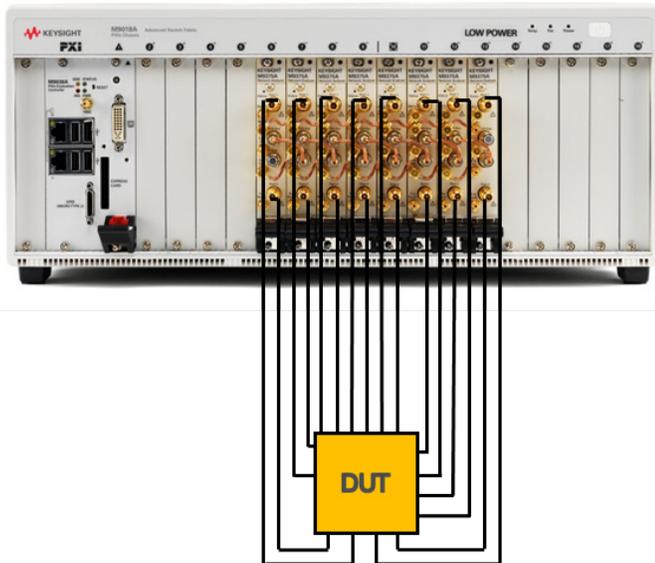


Figure 1. The Keysight PXI VNA is an ideal solution for multiport measurements. Easy to configure, better performance, and much faster speed!

When multiple M937xA modules are used in the following configurations they are configured for multiport operation. The modules may be installed in one chassis and identified by the M937xA firmware as one VNA under a single PXI controller. At least one VNA module in the chassis must have Option 551 (N-Port Calibrated Measurements) to maintain N-port capabilities. The frequency of the multiport array is determined by the lowest frequency module configured in the array. For example, a 4-port analyzer configuration using an M9370A (4 GHz) and an M9375A (26.5 GHz) would have a maximum frequency of 4 GHz when performing 4-port measurements.

This behavior extends to Option 010 and 009. In a multiport configuration only one module must have a valid license for these capabilities to function in multiport mode. However, in a multi-site configuration a license must be purchased for each independent VNA configuration.

Each module is connected into the array with Keysight cables. A Y1242A multiport cable kit should be ordered for each additional module and a single Y1281A accessory and tool kit should be ordered for easier cable connections.

Additional cables and accessories for multiport connections:

#### Y1242A

- Multiport cable kit
- Includes 2 SMB cables and 1 SMA cable for connecting 2 modules together.
- Add one multiport cable kit for each additional 2-port VNA

#### Y1281A

- Accessory and tool kit
- Includes the following tools for SMA and SMB connector removal:
  - 5002-3361 Pull tool for SMB connectors
  - 5023-1450 Custom long deep socket for 3.5/SMA connector nuts

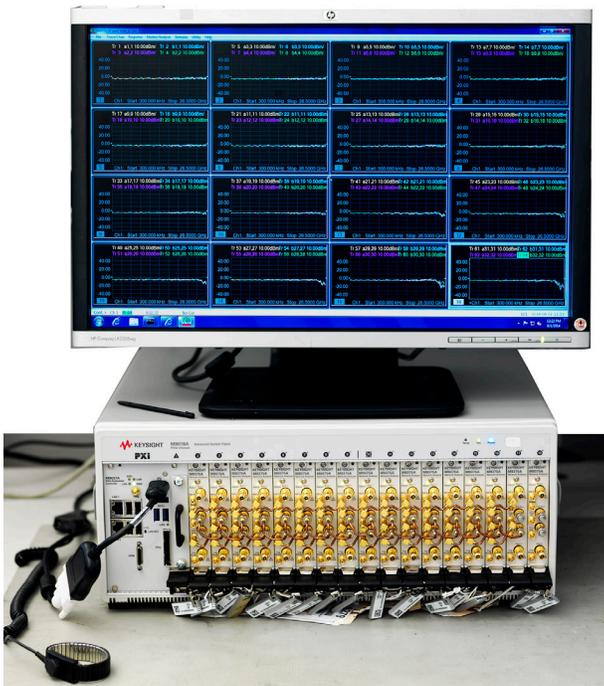
## 8-port Multiport Configuration



## 16-port Multiport Configuration



## 32-port Multiport Configuration



## Multi-site Measurement Configurations

The Keysight M937xA multi-site capability allows for each PXI module to behave as an independent VNA. This makes it possible to run measurements of different devices at the same time or different measurement paths in a single component. In addition, segment sweep enables you to optimize measurement conditions specifically for each device under test, so you can balance speed and accuracy.

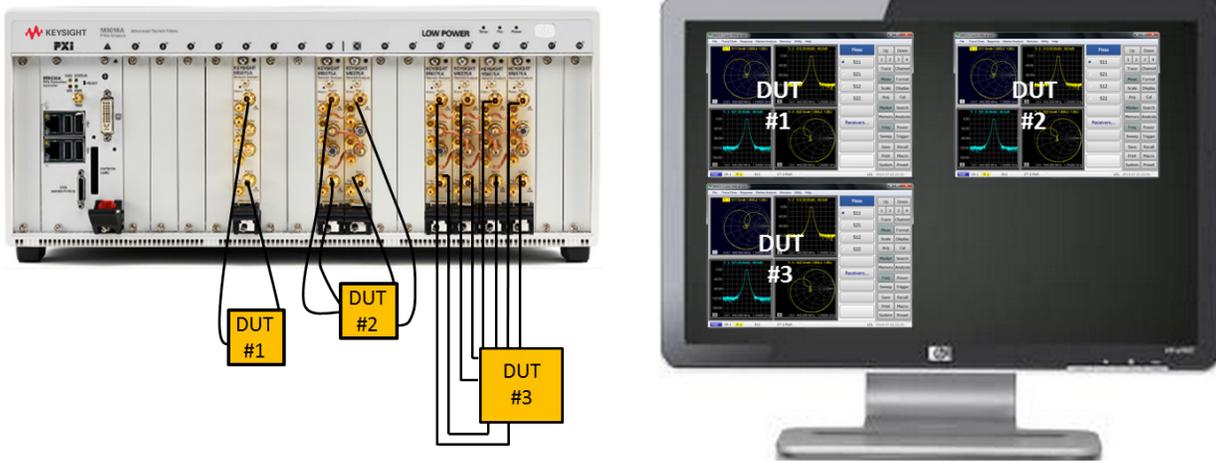


Figure 2. Example of an 8-port multiport VNA, a 2-port VNA, and a 4-port VNA running under three separate copies of the software all executing simultaneously in multi-site operation on the same controller.

For multi-site configurations that require Option 010, a valid license is required for at least one module in each independent VNA configuration.

The Y1242A multiport cable kit only needs to be ordered when modules are used in a multiport configuration.

## Upgrading your system

Your product can be easily upgraded after the initial purchase. Contact your Keysight representative to place an order for an option upgrade (Where -XX is the relevant option number” -007, 010, etc.)

	Order for existing model number					
	M9370A	M9371A	M9372A	M9373A	M9374A	M9375A
Extend analyzer's frequency range to 6.5 GHz	M9370AU-706	N/A	N/A	N/A	N/A	N/A
Extend analyzer's frequency range to 9 GHz	M9370AU-709	M9371AU-709	N/A	N/A	N/A	N/A
Extend analyzer's frequency range to 14 GHz	M9370AU-714	M9371AU-714	M9372AU-714	N/A	N/A	N/A
Extend analyzer's frequency range to 20 GHz	M9370AU-720	M9371AU-720	M9372AU-720	M9373AU-720	N/A	N/A
Extend analyzer's frequency range to 26.5 GHz	M9370AU-726	M9371AU-726	M9372AU-726	M9373AU-726	M9374AU-726	N/A
Add automatic fixture removal capability	M9370AU-007	M9371AU-007	M9372AU-007	M9373AU-007	M9374AU-007	M9375AU-007
Add frequency offset mode/scalar mixer calibration capability	M9370AU-009	M9371AU-009	M9372AU-009	M9373AU-009	M9374AU-009	M9375AU-009
Add time domain capability	M9370AU-010	M9371AU-010	M9372AU-010	M9373AU-010	M9374AU-010	M9375AU-010
Add full n-port correction capability	M9370AU-551	M9371AU-551	M9372AU-551	M9373AU-551	M9374AU-551	M9375AU-551

## Using a Non-Keysight Chassis

The M937xA can be successfully installed in a non-Keysight PXI chassis. Please use the following guidelines.

- Ensure that the chassis has an available PXIe or PXI-H slot which can be used by the M937xA.
- Ensure that the chassis and controller supports 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.

## PC Requirements for M937xA PXIe VNA Control <sup>1</sup>

	<b>Windows 7 and Vista</b>
Operating system	Windows 7 (32 & 64 bit) Windows Vista, SP 1 & 2 (32 & 64 bit)
Processor speed	1.5 GHz dual core (x86 or x64) minimum 2.4 GHz recommended
Available memory	1 GB minimum 8 GB recommended
Available disk space	1.5 GB available hard disk space

## Related Literature

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

- *M937xA PXIe VNA*, Data Sheet, M9370-90002
- *M937xA PXIe VNA*, Startup Guide, M9370-90001
- *M937xA PXIe VNA*, Brochure, 5992-0098EN
- *M937xA PXIe VNA*, Flyer/Photo Card, 5991-4883EN
- *Automated Measurement Expert (AMX) Software*, Brochure, 5992-2287EN

1. For a list of computers compatible with Keysight Technologies PXIe M9018A chassis, refer to Tested Computer Technical Note (literature no. 5990-7632EN).

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)

