Keysight Streamline Series
USB Vector Network Analyzers

P937xA 2-port, Up to 26.5 GHz
P500xA 2-port, Up to 20 GHz

Compact Form. Zero compromise.

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Keysight Streamline Series: Exceptional Performance in a Small Package

Balance deadlines, productivity, budget and bench space with the Streamline Series. You'll move confidently across every stage of your product's development lifecycle by leveraging accurate and repeatable measurements, automated code capability, and a consistent, intuitive user experience. With comprehensive Keysight Services including calibration, education and consulting, these instruments enhance your solution to help you accelerate technology adoption and lower costs.

This configuration guide describes standard configurations, options, accessories, upgrade kits and compatible peripherals for the Keysight Streamline Series USB vector network analyzer (VNA).

P937xA Series	
P9370A	300 kHz to 4.5 GHz, 2-port
P9371A	300 kHz to 6.5 GHz, 2-port
P9372A	300 kHz to 9 GHz, 2-port
P9373A	300 kHz to 14 GHz, 2-port
P9374A	300 kHz to 20 GHz, 2-port
P9375A	300 kHz to 26.5 GHz, 2-port

P500xA Series	
P5000A	9 kHz to 4.5 GHz, 2-port
P5001A	9 kHz to 6.5 GHz, 2-port
P5002A	9 kHz to 9 GHz, 2-port
P5003A	9 kHz to 14 GHz, 2-port
P5004A	9 kHz to 20 GHz, 2-port

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Keysight Streamline Series Vector Network Analyzer Configurations

Model	Description	Test port connectors
P937xA Series		
P9370A	300 kHz to 4.5 GHz, 2-port	3.5 mm (f)
P9371A	300 kHz to 6.5 GHz, 2-port	3.5 mm (f)
P9372A	300 kHz to 9 GHz, 2-port	3.5 mm (f)
P9373A	300 kHz to 14 GHz, 2-port	3.5 mm (f)
P9374A	300 kHz to 20 GHz, 2-port	3.5 mm (f)
P9375A	300 kHz to 26.5 GHz, 2-port	3.5 mm (f)
P500xA Series		
P5000A	9 kHz to 4.5 GHz, 2-port	3.5 mm (f)
P5001A	9 kHz to 6.5 GHz, 2-port	3.5 mm (f)
P5002A	9 kHz to 9 GHz, 2-port	3.5 mm (f)
P5003A	9 kHz to 14 GHz, 2-port	3.5 mm (f)
P5004A	9 kHz to 20 GHz, 2-port	3.5 mm (f)

Test set options

Choose one of the frequency models, and one test set option for the P500xA Series. Option 2xx indicates two test ports. To add options to a product, order the corresponding item number (P500xA-xxx).

Description	2-port	Additional information
P500xA Series		
Option 200	·	Not available for the P937xA Series

Hardware options

Description	For P937xA Series	For P500xA Series	Additional information
Add pulse modulation hardware	N/A	P500xA-021	This option enables the internal pulse modulator on the analyzer's source. S97025A application software is required for pulsed-RF measurements.
Add spectrum analysis hardware	N/A	P500xA-090	S97090A application software is required for spectrum analysis.

Application software[1]

Description	For P937xA Series	For P500xA Series	Additional information
Automatic fixture removal	S97007A	S97007A	
Time domain analysis	S97010A	S97010A	
Basic pulsed-RF measurements	N/A	S97025A	Requires hardware option 021.
Noise figure measurements with vector correction	N/A	S97029A	Standard receivers are used.
Scalar mixer/converter measurements	S97082A	S97082A	Provides ability to independently set the frequency of internal sources and receivers, and to configure external sources. Provides SMC measurement class.
Embedded-LO capability	N/A	S97084A	
Gain-compression measurements	N/A	S97086A	
Spectrum analysis	N/A	S97090A	Requires hardware option 090.
Multiport calibrated measurements	S97551A	S97551A	Provides multiport calibrated measurements using up to two instruments.[2,3,4]

Calibration options

Description	For P937xA Series	For P500xA Series	Additional information
ISO 17025 compliant calibration	P937xA-1A7	P500xA-1A7	
ANSI Z540 compliant calibration	P937xA-A6J	P500xA-A6J	
Commercial calibration certificate with test data	P937xA-UK6	N/A	

1. Supported software license types: node-locked perpetual (1FP), node-locked 12 month (1FL). 1FP is the only type that can be ordered as part of the instrument. The other types have to be ordered as separate items and installed from the web aster the receipt of the instruments.
2. When configuring a multiport VNA using multiple USB VNAs, the Y1710A is recommended for each additional multiport interconnection.
3. The P937xA and P500xA can not be combined in multiport configurations.
4. A 4-port ECal module (i.e. N4431/32/33) is recommended for multiport measurements (n > 4).

Accessories

Description	For P937xA Series	For P500xA Series	Additional information
Accessory and tool kit	Y1281A	Y1281A	Includes the tools for SMA and SMB connector removal
Rack mount kit	Y1700A-001	Y1700A-001	Order Option 001 for 1-slot USB instruments.
Multiple USB instruments configuration kit	Y1701A-001	Y1701A-002	Includes interconnect cables for configurations using two USB instruments. Add one kit for each additional USB instrument.
	Y1701A-101	Y1701A-101	Includes latch kit for connecting two USB instruments.
Hard transit case	Y1710A	Y1710A	
PXI adapter module	N/A	Y1731A-001	Includes PXI module to monitor control signals with the P500xA and 2 flexible control cables.

Measurement Application Software

Solid black series name indicates the feature is available on that series, while gray series name with strikethrough indicates the feature ins not available on that series. For example:

P500xA Series: Available on P500xA series

~~P937xA Series~~: Not available on P937xA Series

Automatic fixture removal (S97007A)

P937xA Series	P500xA Series

Many devices do not have coaxial connectors and are put in fixtures in order to measure them in a coaxial environment. Accurately removing the effects of the fixture is required to get a good measurement of the device under test (DUT). This application adds a powerful application wizard to guide you through characterizing a fixture and removing it from the measurement. Devices can be single-ended or differential. Files can be saved in a variety of formats for later use in ENA, PNA, PXI VNA, USB VNA, ADS, and PLTS.

Time domain analysis (S97010A)

P937xA Series	P500xA Series

This application enables the analyzer to view reflection and transmission responses in time or distance. Use time domain to tune filters, gate out the response of fixtures and cables, characterize the impedance of transmission lines and more.

Basic Pulsed-RF measurements (S97025A)

~~P937xA Series~~	P500xA Series

This application enables internal pulse generators that can be used to control the internal pulse modulators, and it provides an integrated pulse application that uses the wideband-detection method. The software requires hardware option 021 pulse modulator hardware.

The pulse application provides an easy way to set up point-in-pulse measurements with pulse width as narrow as 1 us, and pulse-profile measurements with 40 ns minimum timing resolution. Using the built-in pulse modulators, the USB VNAs are complete pulsed-RF measurement solutions, eliminating the need for external test sets and pulse generators. S97025A also controls external pulse generators and modulators and can synchronize to external master pulses. The Y1731A PXI Adapter Module is recommended if using external master pulses or external pulse modulators.

Noise figure measurements with vector correction (S97029A)

~~P937xA Series~~	P500xA Series

This software application enables high-accuracy noise figure and noise-power measurements of amplifiers utilizing Keysight's unique vector-source-correction technique that uses a source-impedance tuner to remove the effects of imperfect system-source match. This approach yields accuracy that surpasses that provided by the Y-factor method and other cold-source implementations, especially for in-fixture, on-wafer, and automated-test environments. A scalar-calibrated method is also available that offers less accuracy but is faster and does not require an impedance tuner.

The instrument's standard receivers are used for noise figure measurements with the S97029A. An external preamplifier and filter(s) is required for devices with < 30 dB of excess noise (gain plus noise figure in dB). S97029A controls Keysight N469x Series[1] ECal modules configured as impedance tuners for use with the USB VNA.

For calibration, a standard mechanical cal kit or ECal module is required for the S-parameter portion of the cal (an ECal used as a tuner cannot be shared for calibration). To calibrate a standard receiver for noise figure measurements, a power meter is required. All calibration accessories must be ordered separately.

Scalar mixer/converter measurements (S97082A)

P937xA Series	P500xA Series

With a simple setup and calibration, this application delivers the highest accuracy for scalar conversion-loss/gain measurements by combining one-port and power-meter calibrations to remove mismatch errors. S97082A provides an intuitive and easy-to-use user interface for setting up mixer and converter measurements, with single or dual conversion stages. It can control external signal generators for use as LO signals. Supported external sources include the Keysight ESG, PSG, EXG, and MXG Series, as well as other SCPI-controlled signal generators.

S97082A is compatible with S97084A, which enables measurements of converters with internal LOs.

Embedded LO capability (S97084A)

~~P937xA Series~~	P500xA Series

This application tunes the analyzer's receivers to the output frequency of the converter under test without the need for access to internal LOs or a common reference signal. S97084A is intended to work with S97082A measurement applications.

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1. 8509x, N443x or N755xA Series ECal modules are not supported.

Gain compression measurements (S97086A)

~~P937xA Series~~	P500xA Series

The gain compression application (GCA) provides input power, output power, gain, and phase at the compression point of an amplifier over a specified frequency range. GCA's SMART Sweep is very fast and easy-to-use. GCA also includes a guided calibration that corrects for absolute power levels, frequency response, and mismatch errors.

Spectrum analysis (S97090A)

~~P937xA Series~~	P500xA Series

The spectrum analyzer (SA) application adds high-performance microwave spectrum analysis to USB VNAs. With fast stepped-FFT sweeps resulting from optimized data processing, the SA application provides quick spurious searches over broad frequency ranges. Simultaneous spectrum measurements can be done using test and reference receivers. This multi-channel SA can be used with the internal swept-signal generators for efficient measurements of spurious signals emanating from mixers and frequency converters. The SA application employs source-power and receiver-response calibration as well as fixture de-embedding, providing in-fixture and on-wafer spectrum measurements with the highest level of accuracy. Optional external attenuators should be connected with the VNA's test ports to avoid receiver compression when measuring large signals.

The S97090A software requires option 090 spectrum analysis hardware.

Multiport calibrated measurements (S97551A)

P937xA Series	P500xA Series

Keysight USB VNA offers a capability to extend the number of ports for your measurements by using up to two instruments. When multiple instruments are used, they are configured for multiport operation. The instruments may be identified by the firmware as one VNA by an external PC. At least one VNA instrument connected to your PC must have one S97551A license to maintain N-port capabilities with multiple instruments. The frequency of the multiport array is determined by the lowest frequency instrument configured in the array. For example, a 4-port analyzer configuration using a P5000A (4.5 GHz) and a P5004A (20 GHz) would have a maximum frequency of 4.5 GHz when performing 4-port measurements. This behavior extends to other measurement application software (S97xxxA). In a multiport configuration, only one instrument must have a valid license for these capabilities to function in multiport mode.

Each instrument is connected into the array with Keysight cables. A Y1701A Multiple USB instruments configuration kit should be ordered for connection of two P937xA (with Y1701A-001) or two P500xA instruments (with Y1701A-002). A single Y1281A accessory and tool kit should be ordered for easier cable connections.

The P937xA and P500xA can not be combined to configure multiport VNAs due to hardware difference.

Figure 1: 4-port configuration using two P937xA VNAs

Material measurements

P937xA Series	P500xA Series

The Keysight N1500A materials measurement suite streamlines the process of measuring complex permittivity and permeability with a vector network analyzer. Various type of measurements, such as transmission line and free space, arch reflectivity, resonant cavity, and coaxial probe are available as options. The easy-to-use software guides the user through setup and measurement, instantly converting S-parameter network analyzer data into the data format of your choice and displaying the results within seconds. Results can be charted in a variety of formats: ε_r', ε_r'', tand, μ_r', μ_r'', tand$_\mu$, and Cole-Cole.

N1930B Physical Layer Test System (PLTS) Software

P937xA Series	P500xA Series

The PLTS software platform has become an industry standard for calibration, measurement, and analysis of linear passive interconnects such as cables, connectors, backplanes, and printed circuit boards. Utilizing either a vector network analyzer (VNA) or a time domain reflectometer (TDR), fast and accurate measurements can be obtained without in-depth knowledge of microwave measurement techniques. Refer to www.keysight.com/find/plts or the technical overview (literature number 5989-6841EN) for more details.

Upgrading Your System

Upgrade kits are available to add options after initial purchase. To upgrade the USB VNAs, order the corresponding item number. To add application software, order the appropriate standalone mode numbers (S97xxxA).

For P937xA Series

Description	Order for Existing Model Number						User Installable
	P9370A	P9371A	P9372A	P9373A	P9374A	P9375A	
Extend analyzer's frequency range to 6.5 GHz	P9370AU-706	N/A	N/A	N/A	N/A	N/A	No
Extend analyzer's frequency range to 9 GHz	P9370AU-709	P9371AU-709	N/A	N/A	N/A	N/A	No
Extend analyzer's frequency range to 14 GHz	P9370AU-714	P9371AU-714	P9372AU-714	N/A	N/A	N/A	No
Extend analyzer's frequency range to 20 GHz	P9370AU-720	P9371AU-720	P9372AU-720	P9373AU-720	N/A	N/A	No
Extend analyzer's frequency range to 26.5 GHz	P9370AU-726	P9371AU-726	P9372AU-726	P9373AU-726	P9374AU-726	N/A	No

Measurement Accessories

A complete list of RF and microwave test accessories is available on our Web site:
www.keysight.com/find/mta

Accessories are available in these connector types: 50 Ω Type-N, 3.5 mm, 7 mm, 2.4 mm, 2.92 mm, 1.85 mm, 1.0 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.

Cable 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.
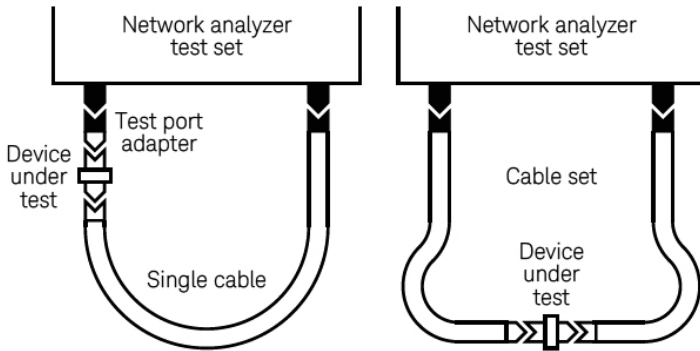
Calibration kits

Coaxial measurements

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

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 Ω airline(s) for TRL calibration
- TRL adapters

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.

For more information about ECal modules, refer to the technical overview 5963-3743E (N4690, 85090, N4430 and N7550 Series).

Waveguide measurements

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

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

For devices with 3.5 mm or SMA connectors

Mechanical calibration kits

85033E economy: DC to 9 GHz. Includes:

- 85033-60016 3.5 mm (m) load
- 85033-60017 3.5 mm (f) load
- 85033-60018 3.5 mm (m) open
- 85033-60019 3.5 mm (f) open
- 85033-60020 3.5 mm (m) short
- 85033-60021 3.5 mm (f) short
- 8710-1761 torque wrench

Option 85033E-100 adds:

- 85027-60005 3.5 mm (f) to 3.5 mm (f) adapter

Option 85033E-200 adds:

- 85027-60007 3.5 mm (m) to 3.5 mm (m) adapter

Option 85033E-300 adds:

- 85027-60006 3.5 mm (m) to 3.5 mm (f) adapter

Option 85033E-400 adds:

- 1250-1744 3.5 mm (f) to 50 Ω Type-N (m) adapter
- 1250-1743 3.5 mm (m) to 50 Ω Type-N (m) adapter
- 1250-1745 3.5 mm (f) to 50 Ω Type-N (f) adapter
- 1250-1750 3.5 mm (m) to 50 Ω Type-N (f) adapter

Option 85033E-500 adds:

- 1250-1746 3.5 mm (m) to 7 mm adapter (two included)
- 1250-1747 3.5 mm (f) to 7 mm adapter (two included)

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 (ECal) modules

85093C RF ECal: 300 kHz to 9 GHz, 2-ports. Standard module includes:

- Option 00F: Both 3.5 mm connectors are female
- Option 00M: Both 3.5 mm connectors are male
- Option M0F: One female and one male connector, both 3.5 mm
- 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
- Option 150: Replaces standard storage container with a wooden box

85093C mixed-connector options

Port A Option			Port B Option		
Connector type	Female	Male	Connector type	Female	Male
3.5 mm	101	102	Type-N 50 Ω	203	204
			7-16	205	206

N4431B ECal: 300 kHz to 13.5 GHz, 4-ports.

Connector Type	Port A Option	Port B Option	Port C Option	Port D Option
Four 3.5 mm (f)	010			
Four Type-N 50 Ω (f)	020			
3.5 mm (f)	101	201	301	401
3.5 mm (m)	102	202	302	402
Type-N 50 Ω (f)	103	203	303	403
Type-N 50 Ω (m)	104	204	304	404
7-16 (f)	105	205	305	405
7-16 (m)	106	206	306	406

Option 150: Replaces standard storage container with a wooden box

N4433A ECal: 300 kHz to 20 GHz, 4-ports.

Connector Type	Port A Option	Port B Option	Port C Option	Port D Option
Four 3.5 mm (f)	010			
3.5 mm (f)	101	201	301	401
3.5 mm (m)	102	202	302	402

Option 150: Replaces standard storage container with a wooden box

N4691D Microwave ECal, DC or 300 kHz to 26.5 GHz, 2-ports. Includes:

- Option F0F: Both 3.5 mm connectors are female
- Option M0F: One female and one male connector, both 3.5 mm
- Option M0M: Both 3.5 mm connectors are male
- 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

N755XA Series Economy ECal, 2-ports:

- N7550A DC to 4 GHz, 2-ports
- N7551A DC to 6.5 GHz, 2-ports
- N7552A DC to 9 GHz, 2-ports
- N7553A DC to 14 GHz, 2-ports
- N7554A DC to 18 GHz, 2-ports
- N7555A DC to 26.5 GHz, 2-ports

N755xA Series includes:

- Option 3FF: Both 3.5 mm connectors are female
- Option 3MF: One female and one male connector, both 3.5 mm
- Option 3MM: Both 3.5 mm connectors are male
- Option 150: Plastic storage box
- N7550X-151: 3.5 mm or 2.92 mm torque wrench

Cables

85131C[1] single, semi-rigid:

- 3.5 mm (f) to PSC-3.5 mm (f), 81 cm, 32 inches

85131D[1] set, semi-rigid:

- 85131-60009 One 3.5 mm (f) to 3.5 mm (m), 53 cm, 21 inches
- 85131-60010 One 3.5 mm (f) to PSC-3.5 mm (f), 53 cm, 21 inches

85131E[1] single, flexible:

- 3.5 mm (f) to PSC-3.5 mm (f), 96.5 cm, 38 inches

85131F[1] set, flexible:

- 85131-60012 One 3.5 mm (f) to 3.5 mm (m), 62.2 cm, 24.5 inches
- 85131-60013 One 3.5 mm (f) to PSC-3.5 mm (f), 62.2 cm, 24.5 inches

85131H[1] single, flexible:

- 3.5 mm (f) to 3.5 mm (m), 62.2 cm, 24.5 inches

85134E[1] single, flexible:

- PSC-3.5 mm (f) to 2.4 mm (f), 96 cm, 38 inches

85134F[1] set, flexible:

- 85134-60004 One 2.4 mm (f) to PSC-3.5 mm (f), 53 cm, 21 inches
- 85134-60003 One 2.4 mm (f) to PSC-3.5 mm (m), 53 cm, 21 inches

1. Special rugged female connector specifically for connecting to the network analyzer test port, but does not mate with a standard male connector.

85134H[1] single, flexible:

- 2.4 mm (f) to PSC-3.5 mm (m), 53 cm, 21 inches

N4419AK20 single, flexible:

- 3.5 mm (m) to 3.5 mm (f), 91.4 cm, 36 inches

Z5623A-K20 single, flexible:

- 3.5 mm (m) to 3.5 mm (m), 91.4 cm, 36 inches

Adapter sets

- 85130D 3.5 mm[1] to 3.5 mm

For devices with Type-N connectors

Mechanical calibration kits

85032F standard, DC to 9 GHz Includes:

- 85032-60017 Type-N (m) fixed load
- 85032-60018 Type-N (f) fixed load
- 85032-60013 Type-N (m) open
- 85032-60014 Type-N (f) open
- 85032-60016 Type-N (m) short
- 85032-60015 Type-N (f) short

Option 85032F-100 adds:

- 85032-60021 Type-N (f) to Type-N (f) adapter

Option 85032F-200 adds:

- 85032-60019 Type-N (m) to Type-N (m) adapter

Option 85032F-300 adds:

- 85032-60020 Type-N (m) to Type-N (f) adapter

Option 85032F-500 adds:

- 85054-60001 Type-N (f) to 7 mm adapter (two included)
- 85054-60009 Type-N (m) to 7 mm adapter (two included)

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1. Special rugged female connector specifically for connecting to the network analyzer test port, but does not mate with a standard male connector.

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 (ECal) modules

85092C RF ECal: 300 kHz to 9 GHz, 2 ports. Includes:

- Option 00F: both Type-N connectors are female
- Option 00M: both Type-N connectors are male
- Option M0F: one female and one male connector, both Type-N
- Option 00A adds:
    - 85054-60037 Type-N (f) to Type-N (f) adapter
    - 85054-60038 Type-N (m) to Type-N (m) adapter

N4432A ECal: 300 kHz to 18 GHz, 4-ports.

Connector Type	Port A Option	Port B Option	Port C Option	Port D Option
Four Type-N 50 Ω (f)	020			
3.5 mm (f)	101	201	301	401
3.5 mm (m)	102	202	302	402
Type-N 50 Ω (f)	103	203	303	403
Type-N 50 Ω (m)	104	204	304	404

Option 150: Replaces standard storage container with a wooden box

N4690D Microwave ECal, DC or 300 kHz to 18 GHz, 2-ports. Includes:

- Option F0F: Both Type-N connectors are female
- Option M0F: One female and one male connector, both Type-N connectors
- Option M0M: Both Type-N connectors are male
- 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

N755XA Series Economy ECal, 2-ports:

- N7550A DC to 4 GHz, 2-ports
- N7551A DC to 6.5 GHz, 2-ports
- N7552A DC to 9 GHz, 2-ports
- N7553A DC to 14 GHz, 2-ports
- N7554A DC to 18 GHz, 2-ports

N755xA Series includes:

- Option NFF: Both Type-N connectors are female
- Option NMF: One female and one male connector, both Type-N
- Option NMM: Both Type-N connectors are male
- Option 150: Plastic storage box
- N7550X-152: Type-N torque wrench

Cables

N6314A 50 Ω Type-N RF cable, DC to 12.4 GHz Includes:

- 8120-8862 one 610 mm (24 in) cable with male connectors

N6315A 50 Ω Type-N RF cable, DC to 12.4 GHz Includes:

- 8121-0027 one 610 mm (24 in) cable with both female and male connectors

Adapter sets

11853A 50 Ω Type-N accessory kit. Includes:

- 1250-1472 Type-N (f) to Type-N (f) adapter (two included)
- 1250-1475 Type-N (m) to Type-N (m) adapter (two included)
- 11511A Type-N (f) short
- 11512A Type-N (m) short

11878A Type-N to 3.5 mm adapter kit. Includes:

- 1250-1744 3.5 mm (f) to 50 Ω Type-N (m) adapter
- 1250-1743 3.5 mm (m) to 50 Ω Type-N (m) adapter
- 1250-1745 3.5 mm (f) to 50 Ω Type-N (f) adapter
- -1250-1750 3.5 mm (m) to 50 Ω Type-N (f) adapter

11524A 7 mm to Type-N (f) adapter

11525A 7 mm to Type-N (m) adapter

85130C 3.5 mm to Type-N Includes:

- 85054-60029 3.5 mm to Type-N (f)
- 85054-60030 3.5 mm to Type-N (m)

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 with collect
- 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 (ECal) modules

N4696D 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

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
- X281C adapter (included in calibration kit): WR-90 to 7 mm

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
- P281C adapter (included in calibration kit): WR-62 to 7 mm

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

K281C adapter (included in calibration kit): WR-42 to 3.5 mm (f) Option 012 WR-42 to 3.5 mm (m)

R Band

R11644A standard, WR-28: 26.5 to 40 GHz. Includes:

- 00914-20028 R-band termination
- 11644-20005 R-band short
- 11644-20003 R-band shim
- 11644-60001 R-band 10 cm straight waveguide
- 11644-60016 R-band 5 cm straight waveguide

Q Band

Q11644A standard, WR-22: 33 to 50 GHz. Includes:

- 11644-60005 Q-band termination
- 11644-20004 Q-band short
- 11644-20001 Q-band shim
- 11644-60002 Q-band 10 cm straight waveguide
- 11644-60017 Q-band 5 cm straight waveguide

U Band

U11644A standard, WR-19: 40 to 60 GHz. Includes:

- 11644-60006 U-band termination
- 11644-20004 U-band short
- 11644-20002 U-band shim
- 11644-60003 U-band 10 cm straight waveguide
- 11644-60018 U-band 5 cm straight waveguide

Verification kits

All Keysight verification kits include:

- Precision Z0 airline or match thru
- Mismatched airline or mismatch thru
- Fixed attenuators (except 85059V)
- Traceable measured data and uncertainties

85051B 45 MHz to 18 GHz 7 mm kit

Includes attenuators, airline and mismatch airline with data on a USB drive for use in confirming calibrated system 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 USB drive for use in confirming calibrated system 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 USB drive for use in confirming calibrated system performance, traceable to national standards. Test procedure is provided in the service manual.

85057B 45 MHz to 50 GHz 2.4 mm kit

Includes attenuators, airline and mismatch airline with data on a USB drive for use in confirming calibrated system performance, traceable to national standards. Test procedure is provided in the service manual.

85058V 45 MHz to 67 GHz 1.85 mm kit

Includes attenuators, match thru and mismatch thru with data on a USB drive for use in confirming calibrated system performance, traceable to national standards. Test procedure is provided in the service manual.

PC Requirements for USB VNA control

Requirement	For P937xA Series
Operating Systems	Windows 7 or Windows 10 (64-bit)
Processor Speed	Intel i5 6th generation or newer/Intel Xeon E3 v3 or newer
Available Memory	4 GB minimum, 16 GB recommended
Available Disk Space	2 GB available disk space minimum
Display Resolution	1024 X 768 minimum
USB	USB 3.0 port directly connected to Intel chipset

Literature Information

Keysight P937xA Series USB Vector Network Analyzer – Data Sheet, 5992-2765EN

Keysight P500xA Series USB Vector Network Analyzer – Data Sheet, 5992-3606EN

Keysight Vector Network Analyzer – Selection Guide, 5980-7603EN

Electric Calibration (ECal) Modules – Technical Overview, 5963-7343E

Web Resources

www.keysight.com/find/usb-vna

www.keysight.com/find/na

www.keysight.com/find/ecal

Learn more at: 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

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