

Keysight Technologies

Performing Line Sweep Measurements with FieldFox Cable and Antenna Analyzers

4/6/6.5/9/14/18/26.5 GHz

Technical Overview

N9912A
N9913A
N9914A
N9915A
N9916A
N9917A
N9918A





Boost your readiness FieldFox

Every piece of gear in your kit had to prove its worth. Measuring up and earning a spot is the driving idea behind Keysight Technologies, Inc.'s FieldFox analyzers.

It starts with adaptability: every operating mode is flexible enough to meet the needs of novices and experts alike. To accelerate your work, each mode has a task-driven interface that saves time in the field. Best of all, FieldFox is designed to withstand your toughest working conditions.

FieldFox is ideal for performing cable and antenna (CAT) measurements. Key CAT measurements include:

- Distance-to-fault, return loss, VSWR, and cable loss (1-port and 2-port)
- Integrated QuickCal – no calibration kit required
- 4/6/6.5/9/14/18/26.5 GHz

Step up to FieldFox – and achieve more in the field.



- Ready to sweep the line at power on (CalReady)
- Working in the dusk or rain
- Screen is clearly viewable under direct sunlight
- Easy file transfer between FieldFox and PC
- Datalink Software provides simple and easy reporting
- Future proof with software licensing upgrade

Pick up FieldFox for its ergonomics
(N9912A 4/6 GHz)

Portrait design and large buttons for easy operation – even with gloves on

Convenient side strap makes it easy to hold and carry

Anti-glare 6.5 inch LCD display with LED backlight

11.5"
(292 mm)

Task-driven keys are grouped to easily perform field measurements

Dedicated marker keys for quick marker function access

Backlit keypad

7.4"
(188 mm)

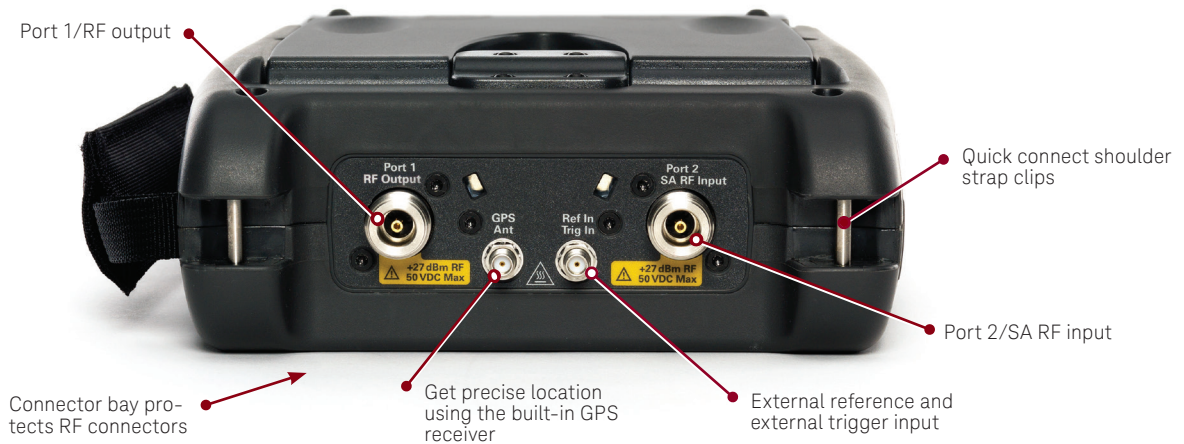


Pick up FieldFox for its ergonomics
N9913A/14A/15A/16A/17A/18A

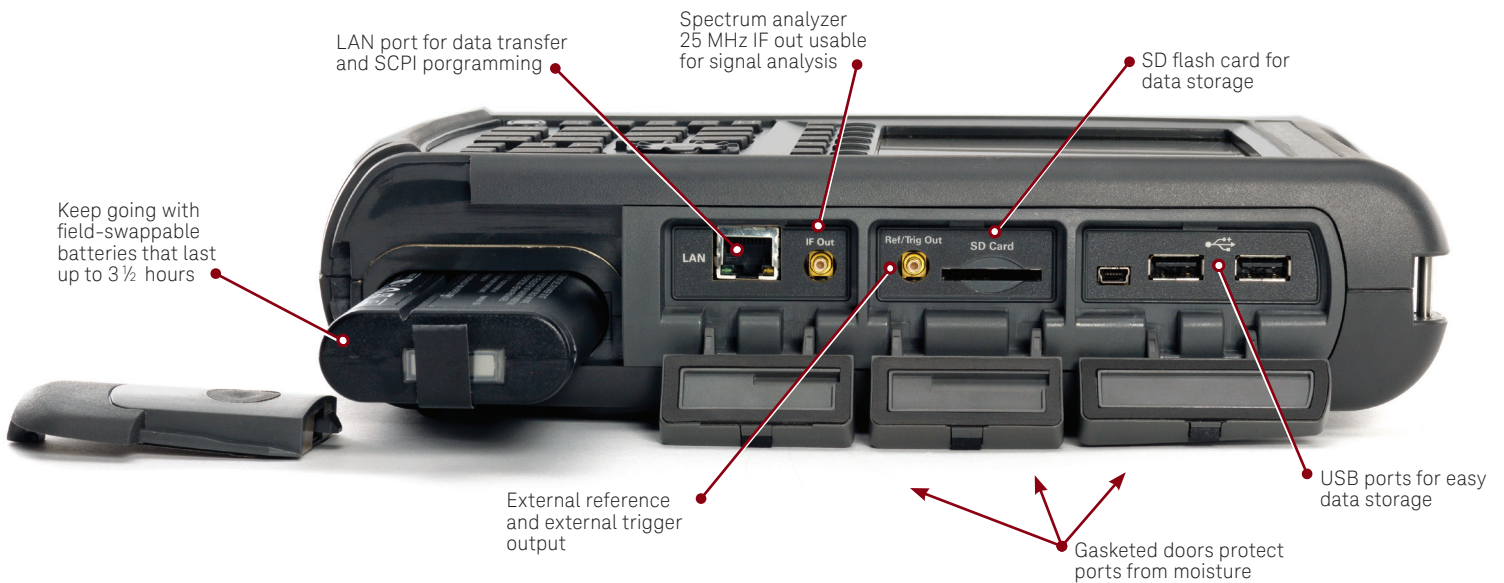


...and depend on its durability and convenience

TOP



RIGHT SIDE



LEFT SIDE





Cable and antenna analyzer measurements

Cable and antenna analyzer

Fifty to sixty percent of microwave-link equipment issues are related to cables, antennas and connectors. Degraded feeder lines cause poor coverage, link failures, and reduced sensitivity on the receive path. To maintain the quality of a RF/MW link, it is critical to keep the cable and antenna systems in good working condition.

Use FieldFox to make return loss, VSWR, insertion loss, 1-port cable loss, and distance-to-fault measurements. You can test antennas, cables, filters, and amplifiers with a single instrument. The amplifiers can be biased using FieldFox's built-in DC source.

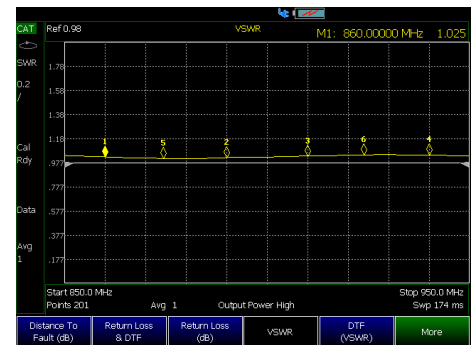
Distance to fault

When the return loss of any given feeder line system, including the antenna, fails to meet specification, the next step is to find which part of the system failed. The distance to fault measurement or DTF is used to transfer frequency domain measurements to distance domain. This helps the user locate the discontinuity in feeder line.

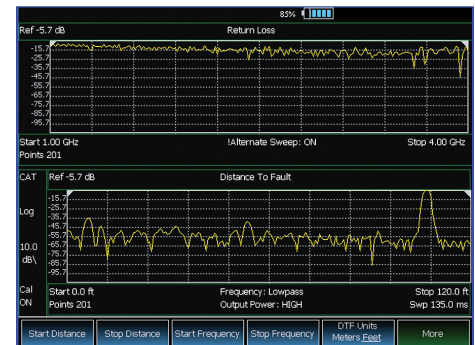
FieldFox can make both return loss and distance-to-fault measurements at the same time. This helps you correlate overall system degradation with specific faults in the cable and antenna system. The built-in cable editor allows you to edit existing cable types on-site, and save them as new cable types with user defined names.

Return loss/VSWR measurements

Return loss /VSWR is the single most important parameter to measure and verify a cable and antenna system. This measurement reflects the power transfer efficiency of a given system. It combines with the distance-to-fault measurement, to help users quickly identify where the faulty RF components are.



VSWR measurement



View and control the RL and DTF displays independently



Cable and antenna measurements

Cable loss measurement (1-port)

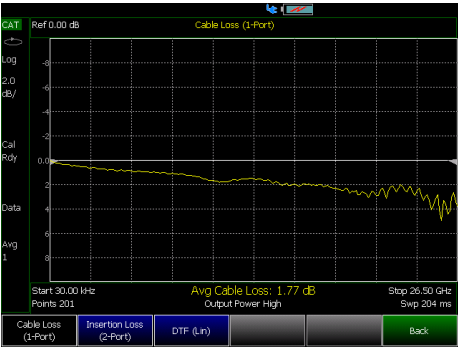
If RF and microwave cables have been installed on a tower or a building, like a distributed antenna system (DAS), it becomes difficult to measure cable loss by accessing both ends of the cable under test. FieldFox allows users to make single-port cable-loss measurements with higher accuracy close to the insertion loss measurement and provides a higher dynamic range for longer cables.

Insertion loss

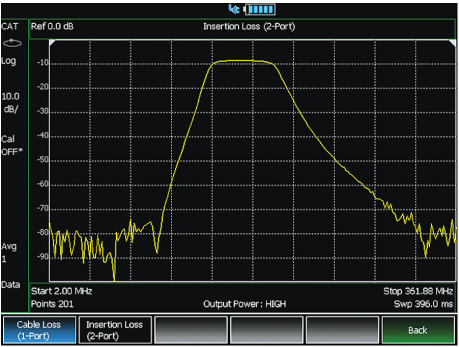
The insertion loss measurement characterizes the loss of a jumper cable, feeder cable, a connector, or an attenuator if both ends are accessible. It can also measure the filter type of devices like diplexer, duplexer, tower mounted amplifier (TMA), low noise amplifier (LNA) and bi-directional amplifier (BDA) etc. For amplifier measurements, it measures gain instead of loss of the device.

Waveguide measurements

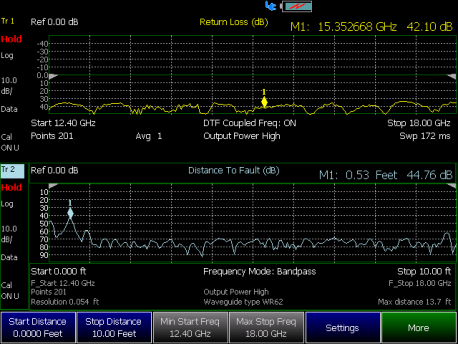
The Waveguides are widely used to provide transmission links between microwave transmitters and antennas, as waveguides have less loss than coax. Due to the dispersion nature of a waveguide, it is always a challenge to figure out the velocity factor (VF) of a particular type of waveguide in DTF (distance-to-fault) measurements. FieldFox can help you automatically calculate waveguide VF when the waveguide type is chosen.



One-port cable loss measurement



Insertion loss display



FieldFox's waveguide distance-to-fault measurement



Calibration

CalReady – calibrated at power on, ready to go

Save time and get right to work with FieldFox's CalReady feature. With CalReady, the analyzer is already calibrated and ready to make measurements such as return loss, VSWR, 1-port cable loss, and DTF measurements without having to connect/ disconnect additional calibration devices.

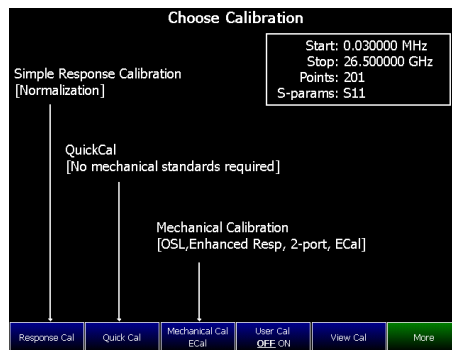
Hassle-free calibration in the field with the industry's first and only QuickCal

FieldFox is the industry's first and only handheld network analyzer with a built-in calibration capability that allows you to calibrate the network analyzer without carrying a calibration kit (cal kit) into the field. With any other test instrument, when you add additional devices to the test port, such as jumper cables or adapters, you need to recalibrate using a cal kit. QuickCal eliminates the need to carry and use a cal kit, and also provides worry-free accuracy.

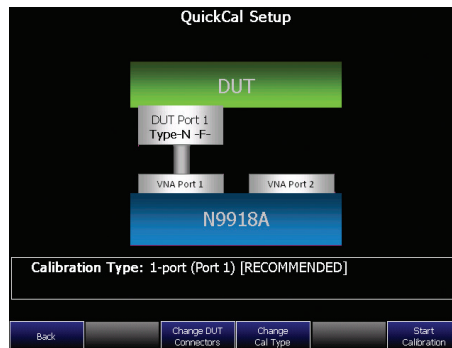
FieldFox's QuickCal supports measurements such as insertion loss/gain, 1-port cable loss, return loss, and DTF.

Mechanical calibration

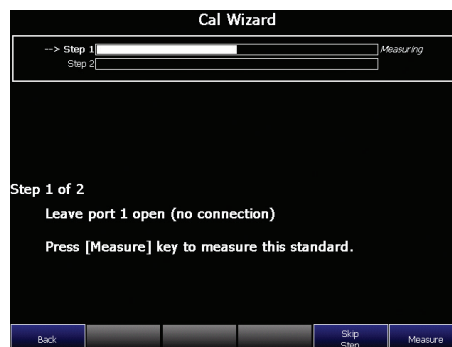
FieldFox supports a wide selection of mechanical calibration kits, such as T cal kits for various frequency ranges. You also can input your own calibration kit using FieldFox's Datalink software.



Step 1 FieldFox's QuickCal allows you to perform calibrations without carrying a cal kit



Step 2



Step 3

Broadband Cal

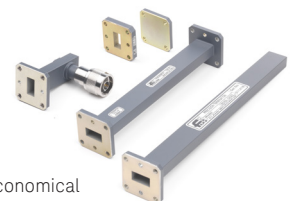
FieldFox allows you to make broadband calibrations, which means the instrument is calibrated over the maximum frequency range. After a broadband calibration, you can change the frequency range or number of points without recalibrating the instrument. The calibration is interpolated, and accuracy is maintained.

Fast and accurate calibration with ECal

The FieldFox calibration engine supports Keysight's USB ECal modules. ECal support reduces calibration time and the need to make multiple connections during testing, while also providing for greater consistency between measurements. For FieldFox users, that translates into fewer human errors and increased accuracy.

Waveguide calibration

Keysight offers both high-performance and also economical waveguide calibration kits. The economical kits (N9911X) are ideal for field maintenance and troubleshooting, as they provide good measurement results at lower costs.



Keysight N9911x economical waveguide calibration kits



Designed for you and the work you do everyday

Carry FieldFox wherever you need to go

- Kit friendly 3.0 kg or 6.6 lbs
- Large buttons are easy to operate, even when wearing gloves
- Field swappable battery lasts up to 4 hours
- Non-slip rubber grip securely fits in your hands and won't slide off the hood of your vehicle
- Vertical "portrait" orientation makes it easy to hold and operate at the same time



Large buttons make it easy to perform spectrum analysis measurements – even with gloves on

Rugged enough to meet MIL-specs

- Completely sealed instrument enclosure provides measurement stability in harsh environments
- Specially designed connector bay protects RF connectors from damage due to drops or other external impacts (designed to withstand 4' drop on concrete surface on all 6 faces)
- Water-resistant chassis, keypad and case withstand wide temperature ranges and salty, humid environments
- Case withstands shock and vibration
- Wide operating temperature –10 to +55 °C (14 to 131 °F)
- Wide storage temperature –51 to +71 °C (–60 to 160 °F)
- Meets MIL-PRF-28800F Class 2 requirements
- Type tested and meets MIL-STD-810G, Method 511.5, Procedure I requirements for operation in explosive environments
- Meets IEC/EN 60529 IP53 requirements for protection from dust and water

Transflective display and backlit key

The display is designed for easy viewing in indoor and outdoor settings and in direct sunlight and darkness. You can also access different display modes via softkeys.



Transflective display makes it easy to read measurements in direct sunlight

Modern connectivity

- Two USB 2.0 ports can be used for data transfer, USB power sensor support, USB keyboard and mouse support
- LAN port: used for SCPI programming, FieldFox Datalink software connection, and remote control via iOS device
- SD flash card slot: use as a data storage device



Remote control capability with iPad or iPhone

Engineers and technicians can now remotely monitor and control their FieldFox using their iOS device such as an iPhone, iPad, or iPod Touch. FieldFox's Remote Viewer iOS app emulates the front panel of the unit, so users can simply press any FieldFox key right from their iOS device. The app also allows users to instantly access technical documents such as data sheets.

Marker and limit lines

FieldFox provides six markers with marker table and limit lines to facilitate measurements. Limit lines or masks can be used for quick pass/fail testing of devices or frequency spectrums. FieldFox allows you to define fixed and relative limit lines, for both the RF spectrum traces and cable and antenna test. Additionally, with a single key press, you can build a limit line table from a current trace, and add offsets or margins to simplify your testing process.

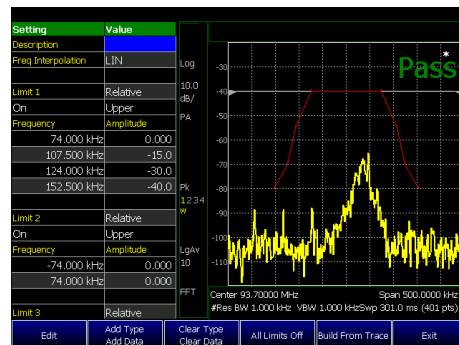
USB keyboard and mouse support

USB keyboard support to make file naming and saving easy.

FieldFox supports USB keyboard and mouse to make text input in the field much easier, like naming files.



Control and view your FieldFox via your iPad



Use limit lines or markers to perform spectrum conformance tests



FieldFox with USB keyboard and mouse for easy file naming

Flexible file system, and file transfer

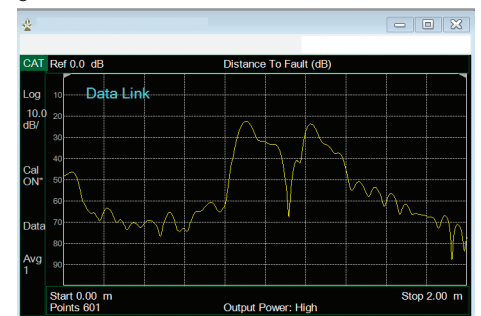
FieldFox adopts the same file system used in any Windows PC. There is no length limitation on file names, you can enter a file name either using a virtual keyboard, or external USB keyboard. Files can be copied to an external USB and SD card, or you can save the files directly to USB and SD flash card too.

Cable files

FieldFox supports an extensive list of cables from various cable manufacturers. To get accurate results for DTF measurements, just simply recall the cable to match a feeder cable under test. In case a cable is not listed on the FieldFox cable selection list, you can take one existing cable and modify it, and re-save it as user defined cable.

FieldFox Datalink software

FieldFox's Data Link software makes report generation and documentation easier.



Use the complimentary Data Link software to generate reports

Comparison table of FieldFox RF analyzer and FieldFox Microwave analyzers

FieldFox	RF analyzer N9912A	Microwave analyzers N9913/14/15/16/17/18A
Maximum frequency range	4/6 GHz	4, 6.5, 9, 14,18, 26.5 GHz
Cable and antenna analyzer	Standard	Standard
Insertion loss/transmission measurement	Option 110	Option 210
Vector network analysis	1-port vector, 2-port scalar Option 303	Full 2-port support
Spectrum analysis	Option 230 or 231	Option 233
Interference analysis	Option 236	Option 236
Independent source	Option 230 or 231	Option 233
Built-in power meter	Option 311	Option 310
USB power sensor support	Option 302	Option 302
Pulse measurement	Option 330	Option 330
Remote control using iOS device	Option 030	Option 030
Built-in DC source		Option 309
Built-in GPS	External USB GPS support	Option 307

Configurations

N9912A cable and antenna analyzer	
FieldFox RF analyzer base functions:	One-port cable and antenna analyzer (4 GHz), broadband calibration, CalReady, standard mechanical cal kit support. Measurements include: return loss, distance-to-fault (DTF), one port cable loss and VSWR.
Standard accessories included N9912A:	AC/DC adapter; battery; soft carrying case comes with backpack and shoulder straps, Quick Reference Guide, and User's Guide.
N9912A FieldFox Options	
Option 104 4 GHz cable and antenna analyzer	
Option 106 6 GHz cable and antenna analyzer	
Upgradable software options for N9912A	
Option 110 Transmission measurement (for insertion loss, filter and amplifier test)	
Option 111 QuickCal	
Option 230 4 GHz spectrum analyzer (requires Option 104)	
Option 231 6 GHz spectrum analyzer (requires Option 106)	
Option 235 Preamplifier for spectrum analyzer (requires Option 230 or 231)	
Option 236 Interference analyzer	
Option 208 USB power sensor measurements versus frequency	
Option 302 External USB power sensor support	
Option 303 Network analysis capability	
Option 308 Vector voltmeter	
Option 010 Network analyzer time domain	
Option 311 Channel power meter	
Option 030 Remote control capability (from iOS device)	
Option 330 Pulse measurements (requires USB peak power sensor)	

Configurations

N9913/14/15/16/17/18A microwave cable and antenna analyzers

FieldFox microwave analyzer N9913/14/15/16/17/18A base functions:	One port cable and antenna analyzer (4 GHz), broadband calibration, CalReady, standard mechanical cal kit support. Measurements include: return loss, distance-to-fault (DTF), one port cable loss and VSWR.
Standard accessories included N9913/14/15/16/17/18A:	AC/DC adapter, battery, soft carrying case comes with backpack and shoulder straps, Quick Reference Guide, and User's Guide.
N9913A FieldFox RF combination analyzer, 4 GHz, cable and antenna analyzer	
N9914A FieldFox RF combination analyzer, 6.5 GHz , cable and antenna analyzer	
N9915A FieldFox microwave combination analyzer, 9 GHz , cable and antenna analyzer	
N9916A FieldFox microwave combination analyzer, 14 GHz , cable and antenna analyzer	
N9917A FieldFox microwave combination analyzer, 18 GHz , cable and antenna analyzer	
N9918A FieldFox microwave combination analyzer, 26.5 GHz 3.5 mm (m) connector, cable and antenna analyzer	
N9913/14/15/16/17/18A base unit is cable and antenna analyzer	

Upgradable software options

Option 112	QuickCal calibration without using external calibration kit
Option 210	Vector network analyzer – transmission and reflection
Option 211	Vector network analyzer – full 2-port S-parameters (requires Option 210)
Option 010	Vector network analyzer time domain (requires Option 210, recommend 211)
Option 233	Spectrum analyzer
Option 235	Preamplifier (requires Option 233)
Option 236	Interference analyzer and spectrogram (requires Option 233)
Option 238	Spectrum analyzer time gating (requires Option 233)
Option 302	External USB power sensor support (requires Keysight U2000 series power sensor)
Option 307	GPS receiver (receiver built-in, external antenna required)
Option 308	Vector voltmeter (for A/B and B/A, requires Option 210 and Option 211)
Option 309	DC bias variable-voltage source
Option 310	Built-in power meter
Option 330	Pulse measurements (requires Keysight USB peak power sensor)
Option 030	Remote control capability (remote viewing and control using iPhone, iPad or iPod Touch)
Option 208	USB power sensor measurements versus frequency
Option 209	Extended range transmission analysis
Option 212	1-port mixed-mode S-parameters
Option 215	TDR cable measurements

Accessories list

N9910X RF/MW handheld analyzer accessories	
N9910X-700	Rugged phase-stable cable, Type-N (m) to Type-N (f), 18 GHz, 3.28 ft or 1 m
N9910X-701	Rugged phase-stable cable, Type-N (m) to Type-N (m), 18 GHz, 3.28 ft or 1 m
N9910X-704	Rugged phase-stable cable, Type-N (m) to TNC (f), 13 GHz, 5 ft or 1.5 m
N9910X-705	Rugged phase-stable cable, Type-N (m) to TNC (m), 13 GHz, 5 ft or 1.5 m
N9910X-708	Rugged phase-stable cable, 3.5 mm (m) to 3.5 mm (f), 26.5 GHz, 3.28 ft or 1 m
N9910X-709	Rugged phase-stable cable, 3.5 mm (f) to 3.5 mm (f), 26.5 GHz, 3.28 ft or 1 m
N9910X-712	Trigger/Reference-In Cable, SMA (m) to BNC (f), 1 m or 3.28 ft
N9910X-713	Bias-tee power cable, SMB (f) to BNC (m), 1 m or 3.28 ft
N9910X-800	T-Calibration kit, 3-in-1, open, short, load, DC to 6 GHz, Type-N (m), 50 ohm
N9910X-801	T-Calibration kit, 3-in-1, open, short, load, DC to 6 GHz, Type-N (f), 50 ohm
N9910X-802	T-Calibration kit, 3-in-1, open, short, load, DC to 6 GHz, 7/16 DIN (m)
N9910X-803	T-Calibration kit, 3-in-1, open, short, load, DC to 6 GHz, 7/16 DIN (f)
N9910X-810	Rugged phase-stable cable, Type-N (m) to Type-N (m), 5 ft or 1.5 m
N9910X-811	Rugged phase-stable cable, Type-N (m) to Type-N (f), 5 ft or 1.5 m
N9910X-812	Rugged phase-stable cable, Type-N (m) to Type-N (m), 12 ft or 3.6 m
N9910X-813	Rugged phase-stable cable, Type-N (m) to Type-N (f), 12 ft or 3.6 m
N9910X-815	Rugged phase-stable cable, Type-N (m) to 7/16 (m), 12 ft or 3.6 m
N9910X-817	Rugged phase-stable cable, Type-N (m) to Type-N (m), 3.28 ft or 1 m
N9910X-820	Antenna, directional, multiband, 800 to 2500 MHz, 10 dBi
N9910X-821	Antenna, telescopic whip, 70 MHz to 1 GHz
N9910X-823	Antenna, cellular narrowband, 824 to 869 MHz
N9910X-824	Antenna, cellular narrowband, PCS 1850 to 1990 MHz
N9910X-825	Antenna, GPS, active
N9910X-843	Coaxial adapter, Type-N (m) to 7/16 DIN (f)
N9910X-845	Adapter kit - Type-N (f) to 7/16 (f), Type-N (f) to 7/16 (m), Type-N (f) to Type-N (f)
N9910X-846	Coaxial adapter, 50 ohm type-N (m) to 75 ohm type-N (f)
N9910X-847	Adapter kit, Type-N (f) to TNC (m) adapter, Type-N (f) to TNC (f) adapter, 13 GHz
N9910X-848	Coaxial adapter, Type-N (f) to 3.5 mm (f), 18 GHz
N9910X-849	Coaxial adapter, Type-N (f) to 3.5 mm (m), 18 GHz
N9910X-850	Coaxial adapter, Type-N (m) to Type-N (m), 18 GHz
N9910X-851	Coaxial adapter, Type-N (f) to Type-N (f), 18 GHz
N9910X-852	Coaxial adapter, Type-N (m) to Type-N (f), 18 GHz
N9910X-860	Fixed attenuator, 40 dB, 100 W, DC-3 GHz, Type-N (m) to Type-N (f)
N9910X-861	Fixed attenuator, 40 dB, 50 W, DC-8.5 GHz, Type-N (m) to Type-N (f)
N9910X-870	Extra battery

N9910X RF/MW handheld analyzer accessories *continued*

N9910X-873	AC/DC adapter
N9910X-874	External bias-tee, 2.5 MHz to 6 GHz, 1 W, 0.5 A
N9910X-875	DC charger and adapter
N9910X-880	Extra soft carrying case with backpack and shoulder strap
N9910X-881	Hard transit case
85514A	Calibration kit, 4-in-1, open, short, load and through, DC to 9 GHz, Type-N (m), 50 ohm
85515A	Calibration kit, 4-in-1, open, short, load and through, DC to 9 GHz, Type-N (f), 50 ohm
85518A	Calibration kit, 4-in-1, open, short, load and through, DC to 18 GHz, Type-N (m), 50 ohm
85519A	Calibration kit, 4-in-1, open, short, load and through, DC to 18 GHz, Type-N (f), 50 ohm
85520A	Calibration kit, 4-in-1, open, short, load and through, DC to 26.5 GHz, 3.5 mm (m)
85521A	Calibration kit, 4-in-1, open, short, load and through, DC to 26.5 GHz, 3.5 mm (f)

N9911X economical waveguide calibration components

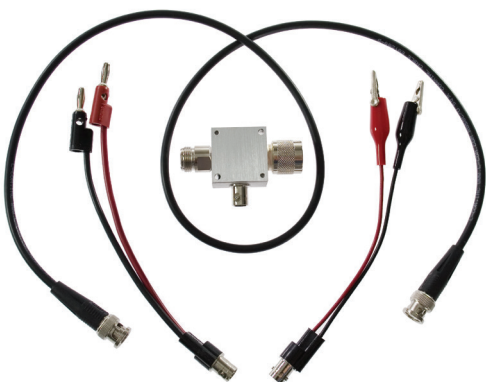
N9911X-110	Waveguide to coaxial adapter, calibration grade, WR-137 to Type-N (m), metric flange, 5.38 to 8.18 GHz
N9911X-111	Termination, calibration grade, WR-137, metric flange, 5.38 to 8.18 GHz
N9911X-112	Flush short, calibration grade, WR-137, metric flange, 5.38 to 8.18 GHz
N9911X-113	1/4 wavelength offset, calibration grade, WR-137, metric flange, 5.38 to 8.18 GHz
N9911X-114	Coupling set for WR-137, metric flange, 5.38 to 8.18 GHz
N9911X-115	Waveguide to coaxial adapter, calibration grade, WR-137 to Type-N (m), imperial flange, 5.38 to 8.18 GHz
N9911X-116	Termination, calibration grade, WR-137, imperial flange, 5.38 to 8.18 GHz
N9911X-117	Flush short, calibration grade, WR-137, imperial flange, 5.38 to 8.18 GHz
N9911X-119	Coupling set for WR-137, imperial flange, 5.38 to 8.18 GHz
N9911X-210	Waveguide to coaxial adapter, calibration grade, WR-90 to Type-N (m), metric flange, 8.2 to 12.5 GHz
N9911X-211	Termination, calibration grade, WR-90, metric flange, 8.2 to 12.5 GHz
N9911X-212	Flush short, calibration grade, WR-90, metric flange, 8.2 to 12.5 GHz
N9911X-213	1/4 wavelength offset, calibration grade, WR-90, metric flange, 8.2 to 12.5 GHz
N9911X-214	Coupling set for WR-90, metric flange, 8.2 to 12.5 GHz
N9911X-215	Waveguide to coaxial adapter, calibration grade, WR-90 to Type-N (m), imperial flange, 8.2 to 12.5 GHz
N9911X-216	Termination, calibration grade, WR-90, imperial flange, 8.2 to 12.5 GHz
N9911X-217	Flush short, calibration grade, WR-90, imperial flange, 8.2 to 12.5 GHz
N9911X-218	1/4 wavelength offset, calibration grade, WR-90, imperial flange, 8.2 to 12.5 GHz
N9911X-219	Coupling set for WR-90, imperial flange, 8.2 to 12.5 GHz
N9911X-310	Waveguide to coaxial adapter, calibration grade, WR-62 to Type-N (m), metric flange, 11.9 to 18 GHz
N9911X-311	Termination, calibration grade, WR-62, metric flange, 11.9 to 18 GHz
N9911X-313	1/4 wavelength offset, calibration grade, WR-62, metric flange, 11.9 to 18 GHz
N9911X-314	Coupling set for WR-62, metric flange, 11.9 to 18 GHz
N9911X-315	Waveguide to coaxial adapter, calibration grade, WR-62 to Type-N (m), imperial flange, 11.9 to 18 GHz
N9911X-316	Termination, calibration grade, WR-62, imperial flange, 11.9 to 18 GHz

N9911X economical waveguide calibration components continued

N9911X-317	Flush short, calibration grade, WR-62, imperial flange, 11.9 to 18 GHz
N9911X-318	1/4 wavelength offset, calibration grade, WR-62, imperial flange, 11.9 to 18 GHz
N9911X-319	Coupling set for WR-62, imperial flange, 11.9 to 18 GHz
N9911X-410	Waveguide to coaxial adapter, calibration grade, WR-42 to 3.5 mm (m), metric flange, 17.6 to 26.7 GHz
N9911X-411	Termination, calibration grade, WR-42, metric flange, 17.6 to 26.7 GHz
N9911X-412	Flush short, calibration grade, WR-42, metric flange, 17.6 to 26.7 GHz
N9911X-414	Coupling set for WR-42, metric flange, 17.6 to 26.7 GHz
N9911X-415	Waveguide to coaxial adapter, calibration grade, WR-42 to 3.5 mm (m), imperial flange, 17.6 to 26.7 GHz
N9911X-416	Termination, calibration grade, WR-42, imperial flange, 17.6 to 26.7 GHz
N9911X-417	Flush short, calibration grade, WR-42, imperial flange, 17.6 to 26.7 GHz
N9911X-418	1/4 wavelength offset, calibration grade, WR-42, imperial flange, 17.6 to 26.7 GHz
N9911X-419	Coupling set for WR-42, imperial flange, 17.6 to 26.7 GHz



Directional antenna, N9910X-820



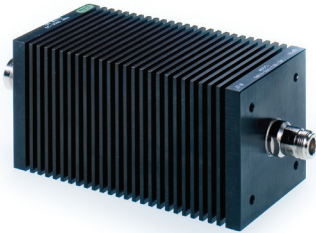
Bias-tees, N9910X-874



Antenna, N9910X-821



Phase stable cable, N9910X-810



100 Watt attenuator, N9910X-860



85514A



85515A



DC car charger and adapter, N9910X-875



Adapter kit, N9910X-845



N9910X-800



N9910X-801

T-Cal kits



N9910X-802



N9910X-803



Soft carrying case with backpack and shoulder straps included with a standard N9912A. For an extra soft carrying case order N9910X-880



Hard transit case, N9910X-881

AC/DC adapter, N9910X-873

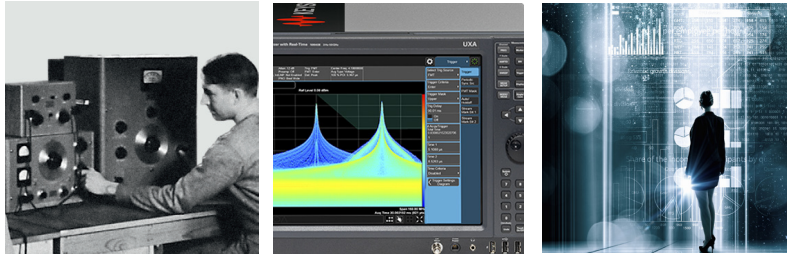
FieldFox fits inside hard transit case

External battery charger, N9910X-872

Evolving Since 1939

Our unique combination of hardware, software, services, and people can help you reach your next breakthrough. We are unlocking the future of technology.

From Hewlett-Packard to Agilent to Keysight.



myKeysight

myKeysight

www.keysight.com/find/mykeysight

A personalized view into the information most relevant to you.

www.keysight.com/find/emt_product_registration

Register your products to get up-to-date product information and find warranty information.

KEYSIGHT SERVICES

Accelerate Technology Adoption.
Lower costs.

Keysight Services

www.keysight.com/find/service

Keysight Services can help from acquisition to renewal across your instrument's lifecycle. Our comprehensive service offerings—one-stop calibration, repair, asset management, technology refresh, consulting, training and more—helps you improve product quality and lower costs.



Keysight Assurance Plans

www.keysight.com/find/AssurancePlans

Up to ten years of protection and no budgetary surprises to ensure your instruments are operating to specification, so you can rely on accurate measurements.

Keysight Channel Partners

www.keysight.com/find/channelpartners

Get the best of both worlds: Keysight's measurement expertise and product breadth, combined with channel partner convenience.

www.keysight.com/find/FieldFox

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

Americas

Canada	(877) 894 4414
Brazil	55 11 3351 7010
Mexico	001 800 254 2440
United States	(800) 829 4444

Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 11 2626
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Other AP Countries	(65) 6375 8100

Europe & Middle East

Austria	0800 001122
Belgium	0800 58580
Finland	0800 523252
France	0805 980333
Germany	0800 6270999
Ireland	1800 832700
Israel	1 809 343051
Italy	800 599100
Luxembourg	+32 800 58580
Netherlands	0800 0233200
Russia	8800 5009286
Spain	800 000154
Sweden	0200 882255
Switzerland	0800 805353
	Opt. 1 (DE)
	Opt. 2 (FR)
	Opt. 3 (IT)
United Kingdom	0800 0260637

For other unlisted countries:

www.keysight.com/find/contactus
(BP-9-7-17)

DEKRA Certified
ISO 9001 Quality Management System

www.keysight.com/go/quality

Keysight Technologies, Inc.
DEKRA Certified ISO 9001:2015
Quality Management System