Agilent FieldFox RF Analyzer

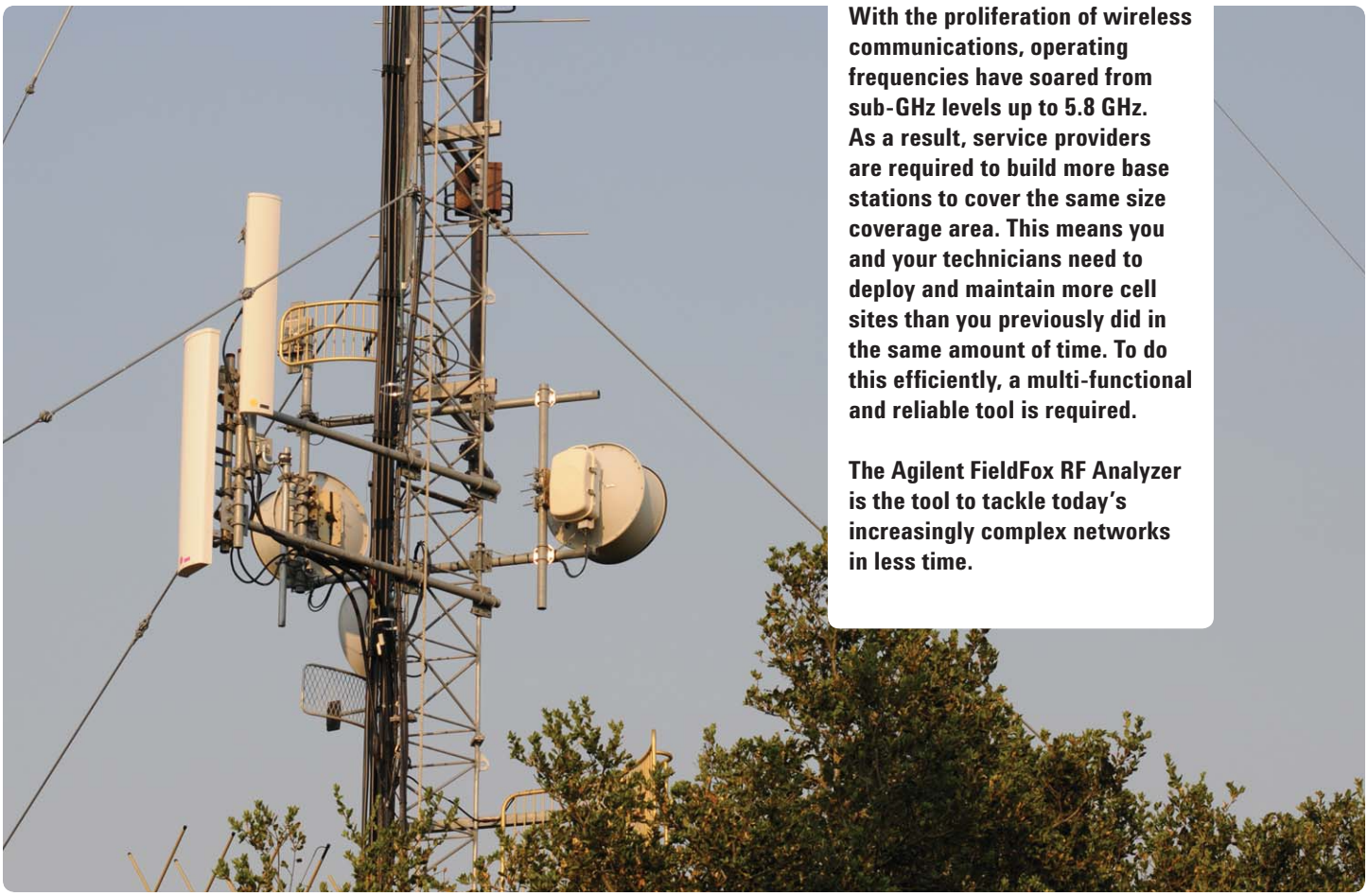
N9912A 4/6 GHz

Technical Overview

Agilent Technologies

Tackle Complex Networks in Less Time

FieldFox



With the proliferation of wireless communications, operating frequencies have soared from sub-GHz levels up to 5.8 GHz. As a result, service providers are required to build more base stations to cover the same size coverage area. This means you and your technicians need to deploy and maintain more cell sites than you previously did in the same amount of time. To do this efficiently, a multi-functional and reliable tool is required.

The Agilent FieldFox RF Analyzer is the tool to tackle today's increasingly complex networks in less time.

World's Most Integrated Handheld RF Analyzer

Key measurements

- Cable and antenna test, distance-to fault, return loss, cable loss
- Vector network analysis with Smith chart display
- Vector voltmeter
- Spectrum analyzer, CHP, ACPR, OBW
- Interference analyzer, spectrogram, waterfall, record and playback
- Independent source
- Power meter

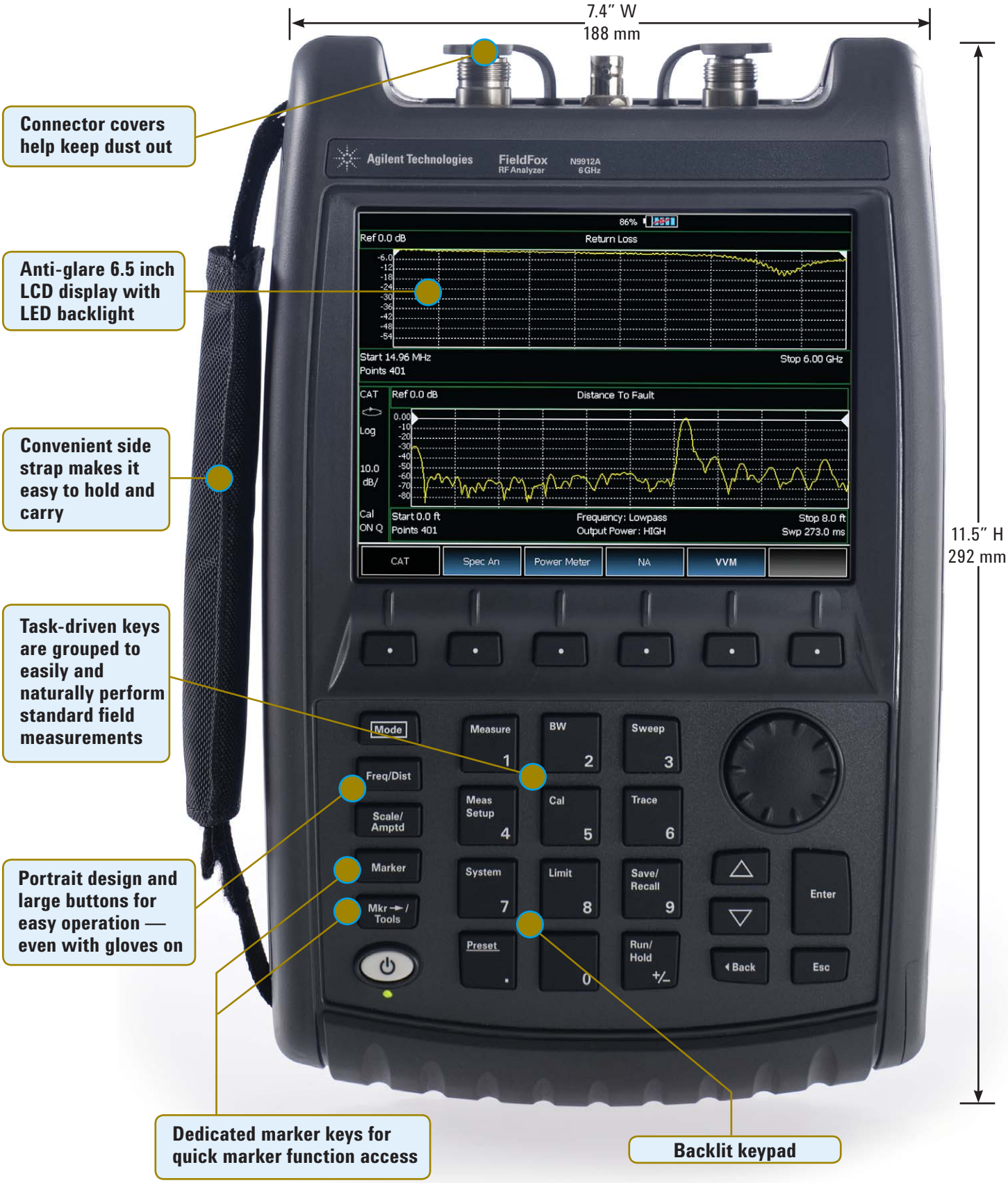
Key differentiators

- Integrated *QuickCal* calibrates without a calibration kit
- Immediate calibration with *CalReady*
- 50 percent faster than traditional handheld instruments
- Superior dynamic range (96 dB) and sensitivity (-148 dBm) in the spectrum analysis mode
- Easy-to-use, task-driven user interface

Cable and antenna analyzer Vector network analyzer	2 MHz to 4/6 GHz
Spectrum analyzer	100 kHz* to 4/6 GHz *Useable to 5 kHz
Signal source	2 MHz to 4/6 GHz

Task-driven Features

FieldFox



Connector bay protects RF connectors

RF Out

External reference and external trigger

Spacious connector design makes connections fast and simple

RF In

Quick-connect shoulder strap clips

Easily accessible battery compartment

LAN port for fast data transfer and SCPI programming

Gasketed doors protect ports from moisture

SD flash card slot for additional data storage

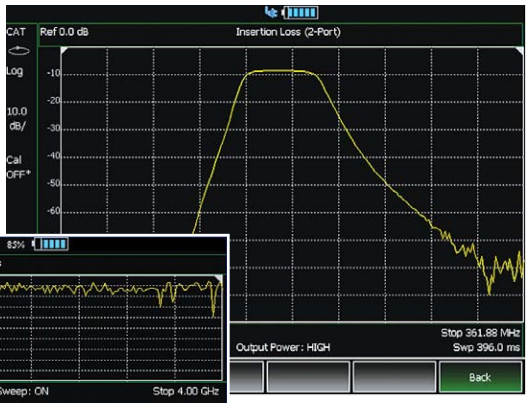
USB ports for convenient data transfer

Simplify interference analysis with AM/FM tune and listen

Cable and antenna analyzer

Fifty to sixty percent of cell site problems are caused by faulty cables, connectors, and antennas. Degraded feed lines cause poor coverage, unnecessary handovers, paging failures, and access failures on uplink. To avoid service quality problems, it is critical to keep cell sites' cable and antenna systems in good condition.

Use FieldFox to make return loss, VSWR, insertion loss/transmission, one-port cable loss, and distance to fault (DTF) measurements. You can test antennas, cables, filters, and amplifiers with a single instrument.



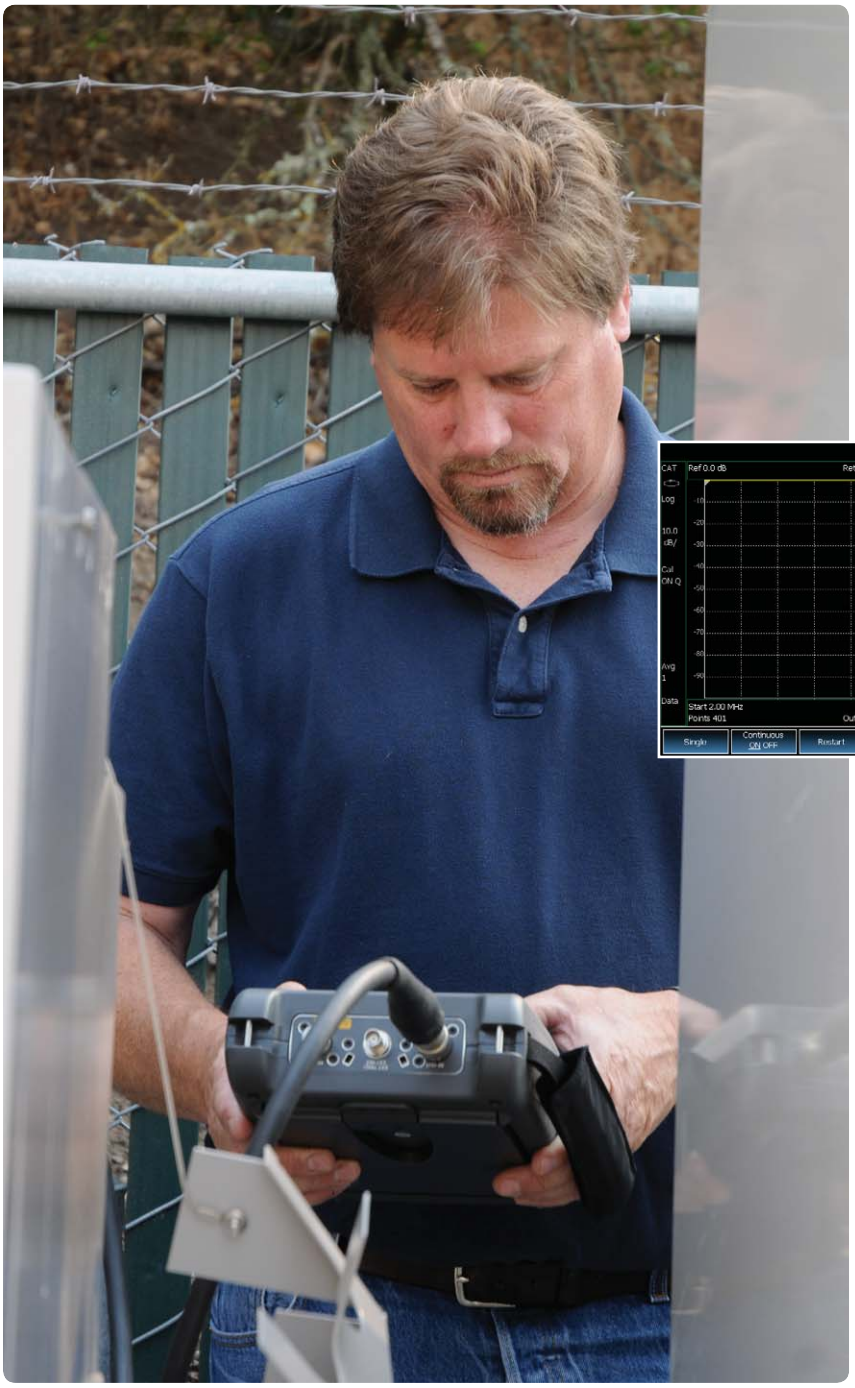
Insertion loss display

Return loss and DTF dual display

Return loss and DTF measurements

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.



Measurements in the field without the need to manually calibrate

Each instrument is ***CalReady*** at the RF Out port, immediately following power-on or preset. This means it's already calibrated and ready to make accurate measurements such as one-port cable loss, VSWR, return loss, and DTF measurements at the test port.

Calibration Wizard

Industry's first and only *QuickCal*

The industry's first and only built-in calibration system allows you to calibrate the cable/antenna tester without carrying a calibration kit into the field. As with any test instrument, when you add an additional device to the test port, such as a jumper cable or attenuator, you need to calibrate using a calibration kit (cal kit). ***QuickCal*** eliminates the hassle of carrying and using a cal kit, plus provides worry-free accuracy and excellent repeatability every time.

Spectrum analyzer display

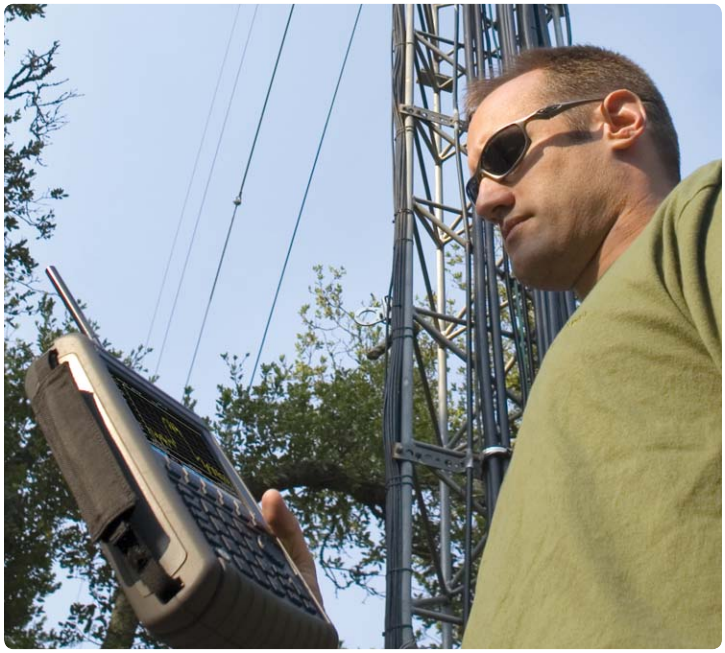
Broadband calibration

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

Built-in spectrum analyzer

Interference is a major source of cell site problems. Interference can be internal or external, and uplink or downlink. Downlink interference reduces coverage, while uplink interference causes access failure. Interference has a direct impact on the quality of service of wireless communication services.

FieldFox has an optional built-in spectrum analyzer that covers frequency ranges from 5 kHz to 6 GHz. It provides a fast spectrum scan to detect interference and RF burst capture to measure intermittent signals. It displays four traces at the same time, and you can choose different detector modes.



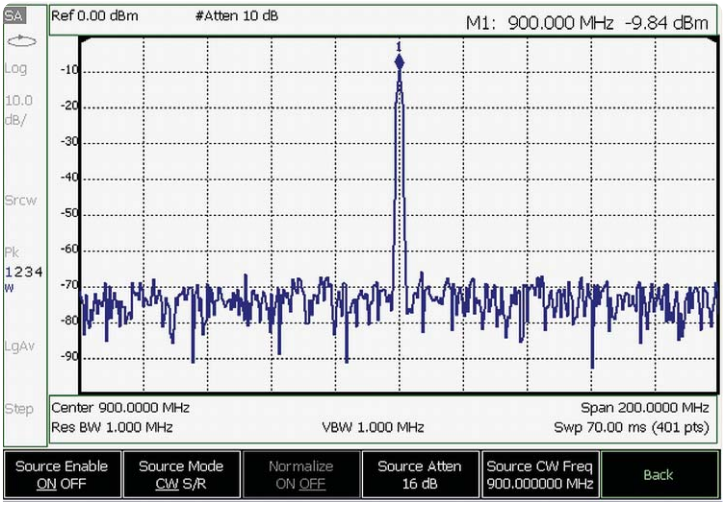
Interference hunting

Interference analyzer

FieldFox interference analyzer is designed for identifying interference signals quickly in the field. It has the best dynamic range on the market (96 dB) with very fast sweep times under narrow resolution bandwidths (RBWs).

FieldFox provides a spectrogram and waterfall display to detect intermittent interference signals or monitor signals of interest for longer periods of time. Signal traces can be recorded into internal memory or external flash memory devices, the saved traces can be played back for offline processing.

FieldFox also allows you to listen to demodulated AM/FM signals to identify signal types.



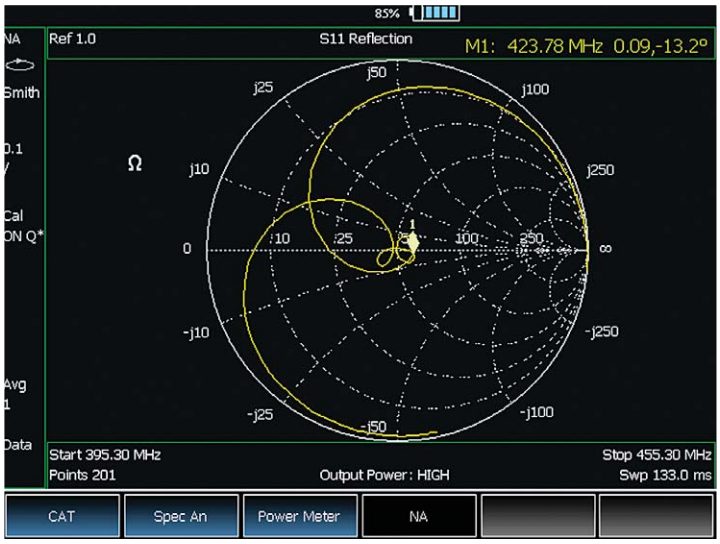
FieldFox's Independent CW signal source

Independent signal source

FieldFox has a built-in independent signal source, with a frequency range of 2 MHz to 4/6 GHz. The signal source and spectrum analyzer can be on at the same time. The signal source can be tuned to any frequency, independent of the spectrum analyzer frequency.

The signal source can be used to create a test signal to measure coverage, antenna isolation, antenna direction alignment, frequency offset device verification, and long cable loss measurement.

FieldFox's source can generate both a CW signal and a swept frequency signal, similar to a traditional tracking generator. This feature is standard on FieldFox RF analyzers with spectrum analyzer Options 230 or 231.



Device input impedance displayed on a Smith chart

Network analysis

FieldFox has an optional network analyzer mode that provides standard vector network analyzer measurements such as S11, S11 phase, a Smith chart display, polar display, and S21 magnitude (requires Option 110).

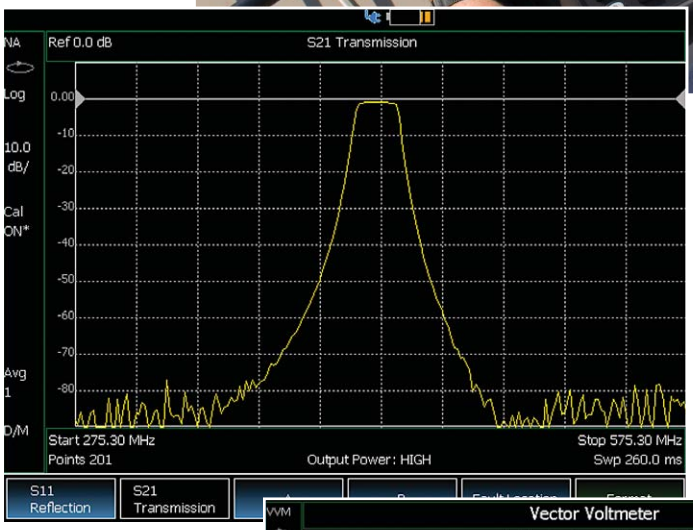
For in-fixture measurements, use FieldFox's port extension or electrical delay capability to easily extend the reference plane to the device interface to provide accurate measurements. You can use the electrical delay capability to measure *deviation from linear phase* by removing the linear portion of the phase delay.

If you need to measure the magnitude and phase of all four S-parameters, consider the N9923A FieldFox RF VNA. Please refer to Agilent FieldFox RF Vector Network Analyzer, literature part number 5990-5087EN.

Power meter

FieldFox can connect with the Agilent U2000 Series USB power sensor to make RF/microwave power measurements up to 24 GHz.

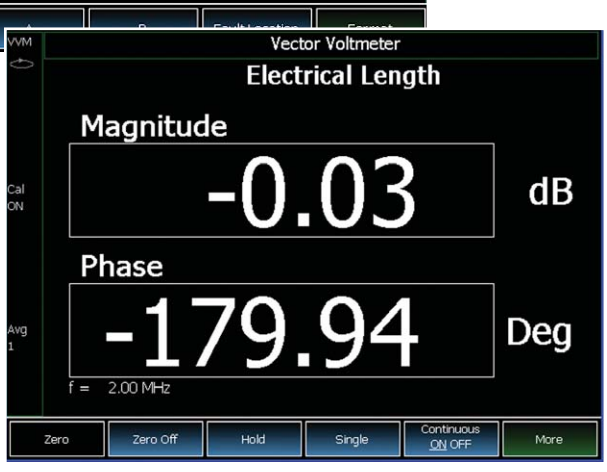
FieldFox provides true average power measurements with a wide dynamic range from -60 dBm to +44 dBm. The sensor has an internal zeroing function, and external calibration is not needed.



Transmission measurement

Transmission measurement

FieldFox provides a 2-port transmission measurement that measures insertion loss, amplifier gain, filter passband, and loss. It also makes a S21 scalar measurement if Option 303 is enabled.



VVM applications:

- **Cable trimming of phase matched cables**
- **Verifying the isolation of 2-port components**
- **Radio navigation – VHF omnidirectional radio range (VOR) and instrumentation landing system (ILS)**

Vector voltmeter

Using FieldFox's vector voltmeter (VVM), the phase shift and electrical length of a device can be measured.

By utilizing the "Zero" function, the phase and electrical length of one device can be measured relative to a "golden device". View results on the large display which can be seen as far as ten feet away. Since every FieldFox is CalReady, no calibration is needed if VVM measurements are done at the test port.

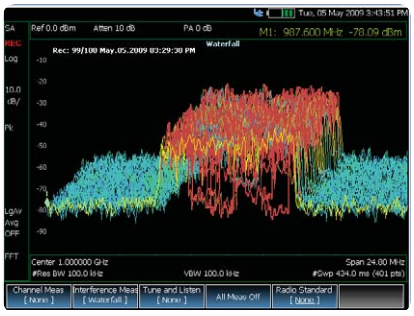
FieldFox offers much of the VVM functionality of the popular HP/Agilent 8508A, in a handheld portable form factor, and without the need for the source/bridge/accessories required with the 8508A.

Feature and Benefit Summary

FieldFox

Perform and view return loss and distance to fault measurements at the same time

Locate interference signals



Waterfall display

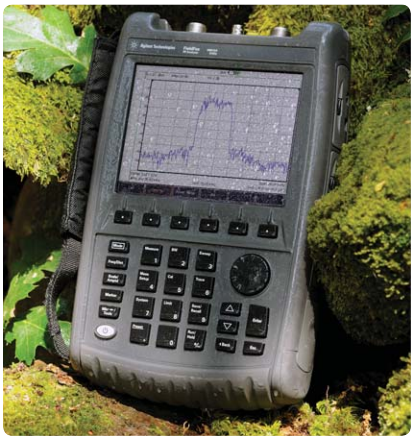
Channel power measurement

Comprehensive measurement capabilities

Cable and antenna test • Return loss, VSWR • Distance to fault	Return loss/VSWR measurements allow you to evaluate the impedance matching performance of the feed line across the frequency range of interest. Distance to fault measurements help you identify the faults along a feed line. Use these measurements to precisely pinpoint the location of damaged or degraded antennas, connectors, amplifiers, filters, and duplexers, etc. FieldFox provides up to 1001 data-point resolution to help accurately locate faults and extend measurement distance.
Transmission test • Cable loss • Insertion loss • Amplifier gain	Transmission test is used to accurately measure cable loss, insertion loss (filters), and amplifier gain (tower mounted amplifier). FieldFox offers two-port transmission magnitude measurements with up to 72 dB dynamic range.
One-port cable loss	For already-installed cables, FieldFox accurately measures cable loss via the RF Out port. The instrument measures actual cable loss, without the need for additional computation.
***CalReady* at test port**	Each instrument is calibrated at the RF Out port. When you power up the instrument, it is ready to make accurate measurements such as one-port cable loss, VSWR, return loss, and DTF at the test port.
QuickCal	The industry's-first and only built-in calibration system allows you to calibrate the cable and antenna tester without carrying a calibration kit with you all the time. It provides worry-free accuracy and excellent repeatability. ***QuickCal*** also corrects drift errors caused by temperature changes during instrument operation.
Mechanical calibration	Open-short-load (OSL) is standard in FieldFox. There are four calibration kits defined in the instrument.
Spectrum analysis	The built-in spectrum analyzer allows you to scan up to 6 GHz and detect internal and external interference. FieldFox can detect signals as low as -148 dBm up to 6 GHz, with phase noise of -88 dBc at 10 kHz, and a third order intercept (TOI) better than +18 dBm.
Interference analyzer	Spectrogram and waterfall displays allow you to detect and monitor intermittent interference signals. The interested signals can be recorded and played back.
Independent signal source	Provides a test signal to measure coverage, antenna isolation, long cable loss, verify frequency offset device, and align antenna direction.
Power suite measurements	Built-in spectrum analyzer provides one-button power suite measurements such as; channel power, ACPR and OBW for LTE, WiMAX, WCDMA, TD-SCDMA, cdma2000 and GSM measurements.
AM/FM tune and listen	The built-in spectrum analyzer can demodulate AM/FM modulated signals and play the audio via speaker or headset. This feature is very useful to identify types of signals.

Make accurate true average power measurements without bringing along a power meter

Transflective display makes it easy to read measurements in direct sunlight



Water resistant chassis withstands wide temperature ranges and humid environments

Comprehensive measurement capabilities *continued*

Power meter	Makes accurate true average power measurements without bringing a power meter along. The state-of-the-art Agilent USB power sensors provide measurements up to 24 GHz.
Smith chart	Smith charts can be used to display impedance matching characteristics in cable and antenna systems.
Vector voltmeter	The large vector voltmeter display makes it easy to match two or more device's electric length and ensure signals that travel on different devices have the same delay.
Electrical delay	Using the electrical delay function, you can remove the linear portion of the phase shift and view the deviation from linear phase.
Port extension	Allows you to extend the reference plan after calibration. This feature is useful for measurements such as in-fixture test, where calibrating at the DUT or reference plane is cumbersome.

Field-proof usability

Transflective display and backlit keys	The display is designed for easy viewing in indoor and outdoor settings and in direct sunlight and darkness. Access different display modes via softkeys.
Task-driven key design	Front-panel keys are grouped to easily and naturally perform standard field measurements.
Speaker and headphone jack	Used for future demodulated audio signal capability.
One-button measurement	Provides task-driven user interface to simplify the measurements.

Rugged design

Water-resistant chassis, keypad and case design	The case is made from polycarbonates that withstand wide temperature ranges and salty, humid environments.
RF connector protection	A specially designed connector bay protects the RF connectors from damage during drops or other external impacts.
Dust-free design	With no vents or fans in the case, FieldFox resists dust for better equipment reliability.
Meets tough environmental standard	Meets MIL-PRF-28800F Class 2 specification.
Gasketed doors	Protects instrument interface from moisture.

Modern connectivity

USB 2.0 ports	Two USB 2.0 ports can be used to transfer files.
LAN port	Used to transfer data in and out of the instrument. Used for SCPI control, and also to transfer data in and out of the instrument.
SD flash card slot	Use as a data storage device.
FieldFox Data Link software	Transfer data remotely from the instrument to a PC for back-office applications such as baseline analysis and report generation.

A condensed version of the specifications is provided here. See the User's Guide for the complete version; http://cp.literature.agilent.com/litweb/pdf/N9912-90001.pdf

Specification (spec.):
Warranted performance. Specifications include guardbands to account for the expected statistical performance distribution, measurement uncertainties, and changes in performance due to environmental conditions. The following conditions must be met:

- FieldFox has been turned on at least 10 minutes (unless otherwise stated)
- FieldFox is within its calibration cycle
- Storage or operation at 25 °C ±5 °C range (unless otherwise stated)

Typical (typ.):
Expected performance of an average unit over a 20 °C to 30 °C temperature range, unless otherwise indicated; does not include guardbands. It is not covered by the product warranty. The FieldFox must be within its calibration cycle.

Nominal (nom.):
A general, descriptive term or design parameter. It is not tested, and not covered by the product warranty.

Cable and antenna analyzer (Option 104 or 106)

Frequency

Frequency range		
Option 104	2 MHz[1] to 4 GHz	
Option 106	2 MHz[2] to 6 GHz	
Frequency reference		
Accuracy	±2 ppm	
Aging rate	±1 ppm/yr	
Temperature stability	±1 ppm over -10 to 55 ºC	
Frequency resolution		
2 MHz to 1.6 GHz	2.5 kHz	
> 1.6 GHz to 3.2 GHz	5 kHz	
> 3.2 GHz to 6 GHz	10 kHz	
Measurement speed		
Return loss	1.5 ms/point (nominal)	1.75 GHz to 3.85 GHz, 1001 points, Cal ON
Distance to fault	2.4 ms/point (nominal)	0 to 500 ft, 601 points, Cal ON
Data points		
	101, 201, 401, 601, 801, 1001	
Directivity		
Corrected	> 42 dB	
***QuickCal* (Option 111)**	> 42 dB (typical)[3]	
Source match		
Corrected	> 36 dB	
***QuickCal* (Option 111)**	≥ 35 dB (typical) [3]	
Reflection tracking		
Corrected	± 0.06 dB	
***QuickCal* (Option 111)**	± 0.15 dB (typical) [3]	

1. Spectrum analyzer (Option 230) start frequency is 100 kHz, usable to 5 kHz.
2. Spectrum analyzer (Option 231) start frequency is 100 kHz, usable to 5 kHz.
3. Requires 90 minute warm up

Dynamic range

Reflection (RF Out port)

2 MHz to 4 GHz	60 dB (typical)
> 4 GHz to 6 GHz	55 dB (typical)

Transmission measurement (Option 110)

2 MHz to 2 GHz	72 dB (typical)
> 2 GHz to 3 GHz	67 dB (typical)
> 3 GHz to 5 GHz	58 dB (typical)
> 5 GHz to 6 GHz	49 dB (typical)

Output power range

High power

2 MHz to 4 GHz	< +8 dBm, +6 dBm (nominal)
> 4 GHz to 6 GHz	< +7 dBm, +2 dBm (nominal)

Low power

2 MHz to 4 GHz	< -23 dBm, -25 dBm (nominal)
> 4 GHz to 6 GHz	< -24 dBm, -29 dBm (nominal)

Immunity to interference

+16 dBm (nominal)

Maximum input level (RF Out port)

+23 dBm

Maximum input DC voltage (RF Out port)

±50 VDC

Cable and antenna measurements

Return loss

Display range	0 to 100 dB
Resolution	0.01 dB

VSWR

Display range	0 to 100
Resolution	0.01

Distance to fault (DTF)

- **Range** = (number of points - 1)/(span*2) x Vf (velocity factor in cable) x c (light speed)
- **Resolution** = range/(number of points - 1)
- **Number of points:** 101, 201, 401, 601, 801, 1001, reflection coefficient
- **Distance to fault display:** Return loss, VSWR

Cable loss (1-port)

Terminated cable under test with short

Insertion loss (2-ports)

Requires Option 110

Transmission measurement (Option 110)

Frequency range

Option 104	2 MHz to 4 GHz
Option 106	2 MHz to 6 GHz

Dynamic range

2 MHz to 2 GHz	72 dB (typical)
2 GHz to 3 GHz	67 dB (typical)
> 3 GHz to 5 GHz	58 dB (typical)
> 5 GHz to 6 GHz	49 dB (typical)

Network analysis (Option 303)

S11	Vector measurement, S11 magnitude and S11 phase. Specification is listed under Cable and antenna analyzer section (S11/Return loss).
S21	Scalar measurement, S21 magnitude. Specification is listed under transmission measurement. S21 requires Option 110 transmission measurement.
A	Reflected power
R	Source power
Display	Log, linear, phase, VSWR, Smith chart, polar, group delay
Calibration types	
	Mechanical cal
	QuickCal
	Normalization
	Automatic cal update with frequency change or number of points change
IF bandwidth selections	
	300 Hz, 1 kHz, 3 kHz, 10 kHz and 30 kHz

Spectrum analyzer (Option 230 or 231)

Frequency

Frequency range	
Option 104	100 kHz to 4 GHz, usable to 5 kHz
Option 106	100 kHz to 6 GHz, usable to 5 kHz, tunable to 6.1 GHz
Frequency reference	
Accuracy	±2 ppm
Frequency aging	± 1 ppm/yr
Frequency reference Temperature stability	± 1 ppm over -10 to 55 °C
Frequency readout accuracy	
	± (readout frequency x frequency reference accuracy + RBW centering + 0.5 x horizontal resolution)
Frequency span	
Range	0 Hz (zero span), 10 Hz to maximum frequency
Span accuracy	±(2 x RBW centering + horizontal resolution)
Span resolution	1 Hz

Resolution bandwidth (RBW)

Range (-3 dB bandwidth)

Zero span	300 Hz to 1 MHz in 1-3-10 sequence; 2 MHz
Non-zero span	10 Hz to 300 kHz in 1/1.5/2/3/5/7.5/10 sequence; 1 MHz, 2 MHz

Accuracy

1 kHz to 1 MHz: ± 5% (nominal)

10 Hz to 100 KHz non-zero span: ± 1% (nominal)

2 MHz: ± 10% (nominal)

300 Hz zero span: ± 10% (nominal)

Selectivity (-60 dB/ -3 dB) 4:1 (nominal)

Video bandwidth (VBW)

Range 1 Hz to 2 MHz in 1/1.5/2/3/5/7.5/10 sequence

Stability

Noise sidebands, CF = 1 GHz

10 kHz offset: -88 dBc/Hz (typical)

30 kHz offset: -89 dBc/Hz, (typical)

100 kHz offset: -95 dBc/Hz, (typical)

1 MHz offset: -115 dBc/Hz, (typical)

Sweep acquisition, span > 0 Hz

Range	1 to 5000, number of data acquisitions per trace point; value is normalized to the minimum required to achieve amplitude accuracy with CW signals
Resolution	1
Readout	Measured value representing time required to tune receiver, acquire data, and process trace

Trace updates

Span = 20 MHz, RBW = 3 kHz: 1.5 updates/second

Span = 100 MHz, RBW auto coupled: 7 updates/second

Span = 6 GHz, RBW auto coupled: 1 update/second

Trace points

101, 201, 401, 601, 801, 1001 points, default is 401

Amplitude

Measurement range

Displayed average noise level (DANL) to +20 dBm

Input attenuator range

0 to 31 dB, 1 dB steps

Maximum DC voltage at RF In port

±50 VDC

Maximum input power at RF In port

+27 dBm (0.5 W)

Displayed average noise level (DANL)

10 Hz RBW, 10 Hz VBW, 50 ohm termination on input, 0 dB attenuation, average detector

Preamplifier OFF

20 to 30 °C

10 MHz to 2.4 GHz	-130 dBm (typical)
> 2.4 GHz to 5.0 GHz	-125 dBm (typical)
> 5.0 GHz to 6.0 GHz	-119 dBm (typical)

Preamplifier ON (Option 235)

20 to 30 °C

10 MHz to 2.4 GHz	-148 dBm (typical)
> 2.4 GHz to 5.0 GHz	-145 dBm (typical)
> 5.0 GHz to 6.0 GHz	-138 dBm (typical)

-10 to 55 °C

10 MHz to 2.4 GHz	< -141 dBm
> 2.4 GHz to 5 GHz	< -138 dBm
> 5 GHz to 6 GHz	< -130 dBm

Total absolute amplitude accuracy[1]

Peak detector, 10 dB attenuation, preamplifier off, RBW < 2 MHz, input signal 0 dBm to -50 dBm, all settings auto-coupled

20 to 30 °C

2 MHz to 10 MHz	±1.8 dB	±0.60 dB (typical)
> 10 MHz to 3.0 GHz	±1.5 dB	±0.50 dB (typical)
> 3.0 GHz to 5.0 GHz	±1.9 dB	±0.60 dB (typical)
> 5.0 GHz to 6.0 GHz	±2.1 dB	±0.60 dB (typical)

Second harmonic distortion (SHI)

-30 dBm signal at input mixer

2 MHz to 1.35 GHz	< -70 dBc, +40 dBm SHI (nominal)
1.35 GHz to 3.0 GHz	< -80 dBc, +50 dBm SHI (nominal)

1. Requires 90 minute warm up

Third order intermodulation distortion (TOI)

Two -30 dBm tones at input mixer, > 100 kHz tone separation

< -96 dBc, +18 dBm TOI (nominal)

Residual responses

Input terminated, 0 dB attenuation, preamplifier off, RBW ≤ 1 kHz, VBW auto-coupled

20 MHz to 3 GHz	-90 dBm (nominal)
> 3 GHz to 6 GHz	-85 dBm (nominal)

Spurious responses

Input mixer level -30 dBm

RFsig = RFtune + 417 MHz	-70 dBc (nominal)
RFsig = RFtune + 1.716 GHz	-80 dBc (nominal)

Input mixer level -10 dBm, first IF image response

RFsig = RFtune – 2 x 0.8346 GHz, for RFtune 5.7 to 6.0 GHz	-50 dBc (nominal)
Sidebands	-80 dBc (nominal)
	-60 dBc (nominal) when battery charging, 260 kHz offset

Preamplifier (Option 235 requires Option 230 or 231)

Option 230	100 kHz to 4 GHz
Option 231	100 kHz to 6 GHz
Gain	22 dB (nominal)

Reference level

Range	-170 dBm to +30 dBm
Resolution	0.1 dB
Accuracy	0 dB (no error)

Traces

4 traces, data/max/average/min

Detectors

Normal, positive peak, negative peak, sample, average

Markers

Marker types	Normal, noise marker
Number of markers or delta markers	6
Marker functions	Peak, next peak, peak left, peak right, marker to center, minimum search

RF In VSWR

1.5:1 (50 ohm)

Trigger

External, video trigger, FFT gating with video (IF envelope) trigger

Independent signal source

Frequency range

2 MHz to 4 GHz (Option 230) or 2 MHz to 6 GHz (Option 231)

Amplitude

High power	2 MHz to 4 GHz	< +8 dBm, +6 dBm (nominal)	**Low power**	2 MHz to 4 GHz	<-23 dBm, -25 dBm (nominal)
	>4 GHz to 6 GHz	<+7 dBm, +2 dBm (nominal)		>4 GHz to 6 GHz	< -24 dBm, -29 dBm (nominal)

Attenuation 0 to 31 dB

Functions Continuous wave, stimulus / response

Power meter measurement (Option 302)

Frequency range

9 kHz to 24 GHz (sensor dependent)

USB power sensor

9 kHz to 24 GHz, see Agilent U2000 Series USB power sensor specifications for details

General specifications

Connector type

Type-N (female)

Input impedance

50 ohm

External reference

Input type BNC female

Reference frequency 10 MHz

Required level -5 dBm to 10 dBm

Display

6.5" transflective, color VGA LED backlit 640 x 480 with anti-glare coating

Speaker

Built-in speaker

Headphone jack

Built-in headphone jack

Connectivity

2 x USB 2.0; 1 x mini USB; 1 x LAN

Internal storage

Minimum 16 MB, up to 1000 traces

External storage

1 x mini SD slot and 2 x USB 2.0

EMC

Complies with European EMC Directive 2004/108/EC

- IEC/EN 61326-2-1)
- CISPR Pub 11 Group 1, Class A
- AS/NZS CISPR 11
- ICES/NMB-001

ESD

- IEC/EN 61000-4-2, functional up to 20 kV test

Safety

Complies with European Low Voltage Directive 2006/95/EC

- IEC/EN 61010-1 2nd Edition
- Canada: CSA C22.2 No. 61010-1-04
- USA: UL 61010-1 2nd Edition

Environmental

Meets MIL-PRF-28800F Class 2 specification

Humidity	95% at 40 °C
Temperature	
Operating	-10 °C to +55 °C
Non-operating	-51 °C to 71 °C

Weight

6.2 lbs / 2.8 kg including battery

Dimensions (H x W x D)

11.5″ x 7.4″ x 2.8″ (292 x 188 x 72 mm)

Power

Power supply	**External DC input:** 15 to 19 VDC
External AC power adapter	
Input	100 to 250 VAC, 50 to 60 Hz; 1.25 to 0.56 A
Output	15 VDC, 4 A
Power consumption	12 W
Battery	6 cell Lithium Ion, 10.8 V, 4.6 A-h
Battery operating time	4 hours

Languages

English, Chinese, French, Spanish, Japanese, Russian, German, and Italian

N9912A FieldFox RF 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; User's Guide

N9912A FieldFox Options

Option 104	4 GHz cable and antenna analyzer
Option 106	6 GHz cable and antenna analyzer
Option 110	Transmission measurement
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 302	External USB power sensor support
Option 303	Network analysis capability
Option 308	Vector voltmeter

N9912A upgrades

The following upgrades are available for the N9912A FieldFox RF Analyzer. More information regarding upgrades is available at: **http://na.tm.agilent.com/fieldfox**

Product number before upgrade	Description	Required Options before upgrade
N9912AU-110	Add transmission measurement capability. Allows use of second port in NA and CAT modes.	None
N9912AU-111	Add QuickCal	None
N9912AU-230	Add 4 GHz spectrum analyzer. May only be installed on 4 GHz instrument.	4 GHz unit only, Option 104
N9912AU-231	Add 6 GHz spectrum analyzer. May only be installed on 6 GHz instrument.	6 GHz unit only, Option 106
N9912AU-235	Add preamplifier to spectrum analyzer	Spectrum analyzer Option, 230 or 231
N9912AU-236	Add interference analyzer	Spectrum analyzer Option, 230 or 231
N9912AU-302	Add external USB power sensor support	None
N9912AU-303	Add network analyzer capability; one port only. For second port, add Option 110.	None
N9912AU-308	Vector voltmeter	None

N9910X RF/MW handheld analyzer accessories

N9910X-800	T-Calibration Kit, DC-6 GHz, Type-N(m)
N9910X-801	T-Calibration Kit, DC-6 GHz, Type-N(f)
N9910X-802	T-Calibration Kit, DC-6 GHz, 7/16 DIN(m)
N9910X-803	T-Calibration Kit, DC-6 GHz, 7/16 DIN(f)
N9910X-810	Rugged phase stable cable, Type-N(m) to Type-N(m), 5 ft
N9910X-811	Rugged phase stable cable, Type-N(m) to Type-N(f), 5 ft
N9910X-812	Rugged phase stable cable, Type-N(m) to Type-N(m), 12 ft
N9910X-813	Rugged phase stable cable, Type-N(m) to Type-N(f), 12 ft
N9910X-814	Rugged phase stable cable, Type-N(m) to 7/16 (m), 5 ft
N9910X-815	Rugged phase stable cable, Type-N(m) to 7/16 (m), 12 ft
N9910X-816	Rugged phase stable cable, Type-N(m) to Type-N (f), 3.28 ft
N9910X-817	Rugged phase stable cable, Type-N(m) to Type-N (m), 3.28 ft
N9910X-820	Antenna, directional, multiband, 800 to 2500 MHz, 10 dBi
N9910X-821	Antenna, telescopic whip, 70 MHz to 1 GHz
N9910X-843	Coaxial adapter, Type-N(m) to 7/16 DIN(f)
N9910X-845	Adapter kit: Type-N(f) to 7/16 DIN(f), Type-N(f) to 7/16 DIN(m), Type-N(f) to Type-N(f)
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-872	External battery charger
N9910X-873	AC/DC adapter
N9910X-874	External bias-tee, 2.5 MHz to 6 GHz, 1 W, 0.5 A
N9910X-875	DC car charger and adapter
N9910X-880	Extra soft carrying case with backpack and shoulder strap
N9910X-881	Hard transit case
N9910X-884	Extra N9912A shoulder strap

For more information go to: www.agilent.com/find/fieldfox

Configuration Information

Directional antenna, N9910X-820

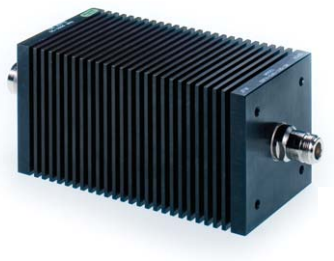
Bias-tees, N9910X-874

External battery charger, N9910X-872

Antenna, N9910X-821

Phase stable cable, N9910X-810

AC/DC adapter, N9910X-873



100 Watt attenuator, N9910X-860

Adapter kit, N9910X-845

DC car charger and adapter, N9910X-875

N9910X-800

N9910X-801

N9910X-802

N9910X-803

T-Cal kits

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

FieldFox fits inside hard transit case

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