

KEYSIGHT TECHNOLOGIES (AGILENT HP)

N9928A

The Keysight N9928A FieldFox is a handheld microwave vector network analyzer operating from 30 kHz to 26.5 GHz. It provides high benchtop-level accuracy in a rugged, portable form factor, designed to withstand harsh field environments. Featuring a 4-receiver architecture, it supports a wide variety of calibrations and capabilities including full 2-port S-parameter measurements, time domain analysis, distance-to-fault measurements, and integrated power monitoring.

SPECIFICATIONS

General

Interfaces	LAN, USB Host (2 ports), USB Device (Mini-B), External Reference Input (BNC), External Trigger (BNC), MicroSD slot, Headphone jack, GPS antenna (SMA)
Display	6.5-inch transfective color LCD, 640 x 480 resolution
Kensington Lock Slot	Standard Kensington lock slot

Physical

Operating Temperature	-10 to 55 °C °C
Dimensions (W×H×D)	292 x 188 x 72 mm mm
Weight	3.0 kg (with battery) kg

Frequency & Stimulus Specifications

Frequency Range	30 kHz to 26.5 GHz
Frequency Resolution	1 Hz
Frequency Aging Rate	±1 ppm/year
Number of Test Ports	2
Test Port Impedance	50 Ω (nominal), 75 Ω (with appropriate adapter/cal kit)
Output Power Resolution / Step Size	1 dB
Output Power Range	High, low, and manual (Low power is -45 dBm nominal)
Test Port Output Power (30 kHz to 300 kHz)	-11 dBm (typical)
Test Port Output Power (>300 kHz to 2 MHz)	-3 dBm (typical)
Test Port Output Power (>2 MHz to 625 MHz)	-2 dBm (typical)
Test Port Output Power (>625 MHz to 3 GHz)	+1 dBm (typical)
Test Port Output Power (3 to 6.5 GHz)	-1 dBm (typical)
Test Port Output Power (6.5 to 9 GHz)	-2 dBm (typical)
Test Port Output Power (9 to 14 GHz)	-4 dBm (typical)
Test Port Output Power (14 to 18 GHz)	-6 dBm (typical)
Test Port Output Power (18 to 23 GHz)	-10 dBm (typical)
Test Port Output Power (23 to 26.5 GHz)	-12 dBm (typical)

Receiver & Dynamic Range Specifications

System Dynamic Range (>300 kHz to 9 GHz)	100 dB (typical, 300 Hz IFBW)
System Dynamic Range (9 to 14 GHz)	97 dB (typical, 300 Hz IFBW)
System Dynamic Range (14 to 18 GHz)	94 dB (typical, 300 Hz IFBW)
System Dynamic Range (18 to 20 GHz)	90 dB (typical, 300 Hz IFBW)
System Dynamic Range (20 to 25 GHz)	79 dB (typical, 300 Hz IFBW)
System Dynamic Range (25 to 26.5 GHz)	70 dB (typical, 300 Hz IFBW)
Trace Noise Magnitude (>300 kHz to 10 GHz)	±0.002 dB rms (300 Hz IFBW)
Trace Noise Phase (>300 kHz to 10 GHz)	±0.014 degrees rms (300 Hz IFBW)
Trace Noise Magnitude (10 to 20 GHz)	±0.004 dB rms (300 Hz IFBW)
Trace Noise Phase (10 to 20 GHz)	±0.027 degrees rms (300 Hz IFBW)
Trace Noise Magnitude (20 to 26.5 GHz)	±0.010 dB rms (300 Hz IFBW)
Trace Noise Phase (20 to 26.5 GHz)	±0.066 degrees rms (300 Hz IFBW)
Maximum RF Input Damage Level	+27 dBm
Maximum DC Input Damage Level	±40 VDC

Measurement Speed & Settings

IF Bandwidths	10 Hz, 30 Hz, 100 Hz, 300 Hz, 1 kHz, 3 kHz, 10 kHz, 30 kHz, 100 kHz
Number of Measurement Points	101, 201, 401, 601, 801, 1001, 1601, 4001, 10001 (arbitrary points settable through SCPI)

Measurement Capabilities & Calibration

Measured Parameters (T/R)	S11, S21
Measured Parameters (Full 2-Port)	S11, S21, S22, S12 (requires Option 211)
Calibration Types	CalReady, 1-port QuickCal, 1-port SOL, 1-port Frequency Response, Enhanced Response, 2-port QuickCal, 2-port SOLT/Offset Short, 2-port SOLT, 2-port Unknown Thru
Supported Calibration Kits	Type-N 50 Ω , Type-N 75 Ω , 7/16, TNC, 3.5 mm, 2.4 mm, Waveguide (WR-90, WR-62, WR-42), custom coaxial/waveguide
Time Domain Option	Supported (Option 010; includes gating)
Cable and Antenna Analyzer Option	Supported (Option 305; Distance-to-fault, return loss, cable loss)
Vector Voltmeter (VVM) Option	Supported (Option 308)
Built-in Power Meter Option	Supported (Option 310)
Built-in GPS Receiver Option	Supported (Option 307)

Hardware Interfaces & Connections

Test Port Connector Type	3.5 mm male (50 Ω nominal)
External Reference Input Frequency	10 MHz
External Reference Input Level	-3 to +10 dBm
External Trigger Input/Output	BNC female, TTL compatible
USB Ports	2 x USB 2.0 Host, 1 x Mini-USB Device (Type-B)
LAN Interface	100Base-T (RJ-45)
GPS Antenna Input	SMA female

System, Controller & Storage

Data Storage Formats	.s1p, .s2p, .csv, .txt, .png, .state
Remote Control Language	SCPI
Storage Media	Internal Flash, SD card, or USB Flash Drive

Physical, Environmental & Power

Storage Temperature Range	-51 °C to 71 °C (without battery)
Environmental Resistance	Meets MIL-PRF-28800F Class 2 requirements
Ingress Protection Rating	IP53
Battery Life	4 hours (typical)
Battery Charging Time	4 hours (typical, analyzer off)
Warranty	3-year standard

Performance

Sweep Speed (201 Points, 1-Port Cal)	210 ms (100 kHz IFBW)
Sweep Speed (201 Points, 2-Port Cal)	400 ms (100 kHz IFBW)

Inputs & Outputs

External Reference Output Frequency	10 MHz
External Reference Output Level	0 to 10 dBm (nominal)
Headphone Jack	3.5 mm miniature jack
SD Card Slot	Supports SD/SDHC card (up to 16 GB)
Internal Speaker	Built-in speaker

Power

Battery Type	10.8 V, 4.6 Ah, 50 Wh Lithium-Ion
AC/DC Adapter Output	15 VDC, 4.0 A
Power Consumption (Typical)	14 W (battery charging off)
External DC Input	15 to 19 VDC, 4 A

Environmental

Maximum Operating Altitude	9,144 m (30,000 ft)
Maximum Non-Operating Altitude	15,240 m (50,000 ft)
Operating Humidity	95% relative humidity at 40 °C (non-condensing)
Battery Charging Temperature Range	0 to 45 °C

Compliance & Standards

Vibration Standard	Meets MIL-PRF-28800F Class 2, MIL-STD-810G, Method 514.6, Procedure I
Explosive Atmosphere Standard	MIL-STD-810G, Method 511.5, Procedure I

Options

USB Power Sensor Support (Option 302)	Enables connection to Keysight USB power sensors
Remote Control Capability (Option 030)	Enables remote control via LAN using SCPI or FieldFox iOS application

Measurement Capabilities

Group Delay Aperture	0.25% to 20% of span
Mixed-Mode S-Parameters (Option 212)	Supported
TDR Cable Measurements (Option 330)	Supported

Compliance

EMC Standard Compliance	IEC/EN 61326-1, CISPR 11 Class A, Group 1
Safety Standard Compliance	IEC/EN 61010-1

Calibration

QuickCal (Option 112)	Supported
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Display

Display Size	6.5 in (165 mm) diagonal
Display Resolution	640 x 480 VGA

TECHNOLOGY

Vector Network Analysis (VNA)

APPLICATIONS

Microwave antenna, cable, and transmitter/receiver installation, maintenance, and troubleshooting in industrial, aerospace, defense, and field environments.

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