



## Agilent Power Meters and Power Sensors

High performance solutions for peak and average power measurements





*Agilent's power meters have long been recognized as the industry standard for RF and microwave power measurements.*

# Introducing Agilent power meters and sensors



## **Reliable, high-performing solutions**

*Every power meter and sensor from Agilent consistently delivers great results.*



## **A sure investment for many years to come**

*Code-compatibility between power meters reduces the need for re-coding. Not only that, all Agilent power meters are backward-compatible with most legacy power sensors.*



## **One specific application: One right solution**

*Agilent offers a wide selection of power meters and sensors for practically all application needs—wireless communications, radar pulse measurements, component test and more.*



## **Global network support**

*No matter where you are, Agilent is committed to giving you the 24-hour support you need regarding our products, applications or services.*

## Explore Agilent power solutions further

### **Peak and average power measurements**

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### **Average power measurements**

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## For compact ATE systems

### Agilent N8262A P-Series modular power meter

The N8262A is a dual-channel, LXI Class C compliant power meter that's designed to support LAN-based ATE systems. With its slim, half-rack build, the N8262A enables a smaller test system and ensures easier deployment.



#### Highlights

- ✓ Deploy test systems more easily
- ✓ Lower test system startup cost
- ✓ Integrate easily into existing systems
- ✓ Perform remote access and control from anywhere

#### Features

##### Dimension

- 1U half-rack size

##### Specifications

- 30 MHz video bandwidth
- 100 Msamples/s continuous sampling rate

##### Measurement type

- Peak, average, peak-to-average ratio power measurements
- Time-gated and free-run measurement modes
- CCDF statistical analysis
- Rise time, fall time, pulse width, time to positive occurrence and time to negative occurrence measurements
- Includes predefined configurations for WLAN, radar and MCPA

##### Calibration

- Calibration and correction factors in EEPROM (P-Series and E-Series sensors)
- Internal zeroing and calibration (P-Series sensors) \*Refer to page 9

##### Remote programmability

- SCPI standard interface commands \*Also programmable in other languages. See "System-ready software" below
- 10/100BaseT LAN interface

##### System-ready software

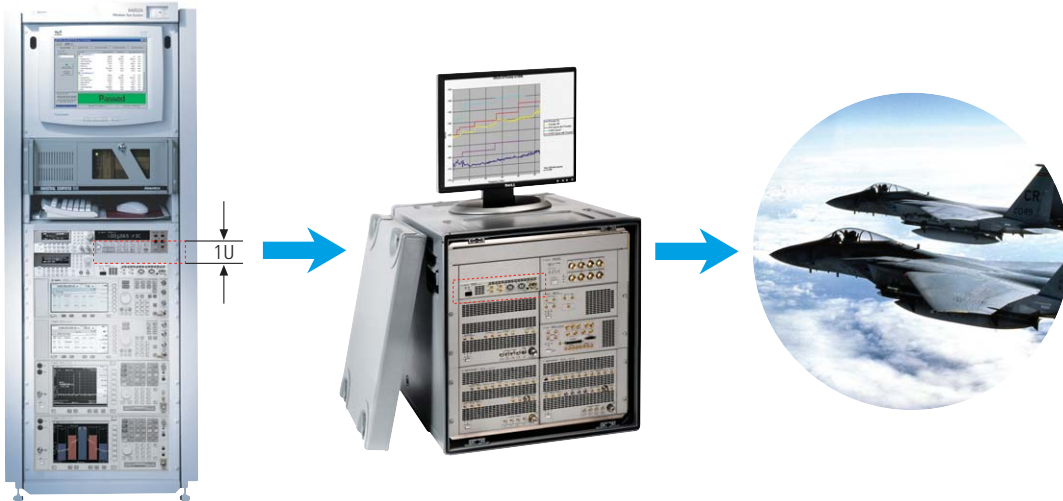
- Bundled Synthetic Instrument Finder works with all LXI-compliant instruments
- Instrument Web page is accessible with any standard Web browser
- Bundled Power Meter GUI is also compatible with P-Series power meters
- Bundled IVI driver enables programming in your choice of environment, including Agilent VEE, LabVIEW, C, C#, C++, Microsoft® Visual Basic, and MATLAB®

##### Backward-compatibility

- Code-compatible with N1912A P-Series power meter

### Deploy test systems more easily

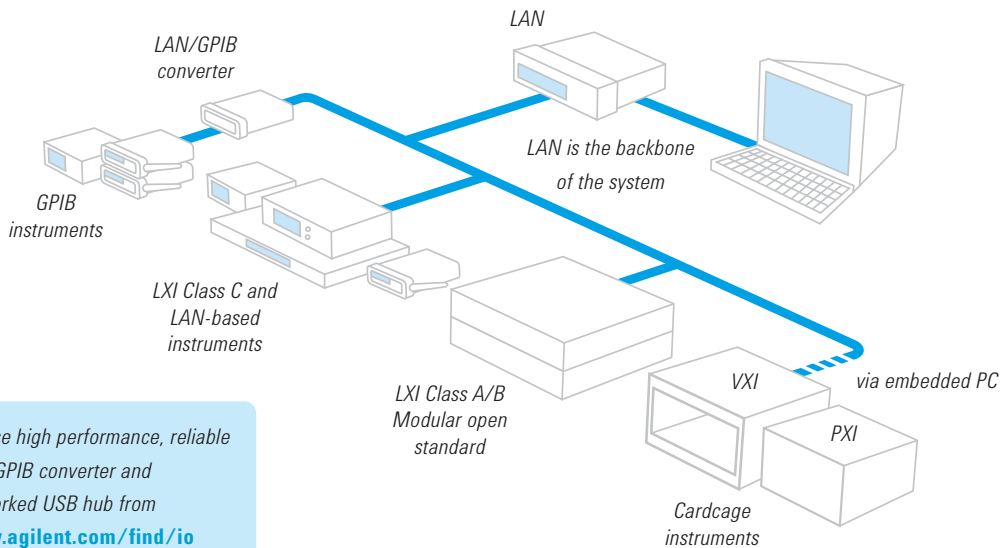
With its 1U half-rack size, the N8262A eases deployment of test systems wherever duty calls.



Smaller test systems are possible with the 1U N8262A, making it more readily deployable

### Integrate easily into an existing system at a lower startup cost

The N8262A can operate without imposing expensive overhead—from cardcages, system controllers or power supplies—on your test system. Once an N8262A is detected on the network, you can access and configure its settings through any standard Web browser, and start measurements right away with the bundled Power Meter GUI soft front panel. With programming flexibility, use your preferred programming language (including SCPI, Agilent VEE and C) instead of spending time re-coding in an unfamiliar language.

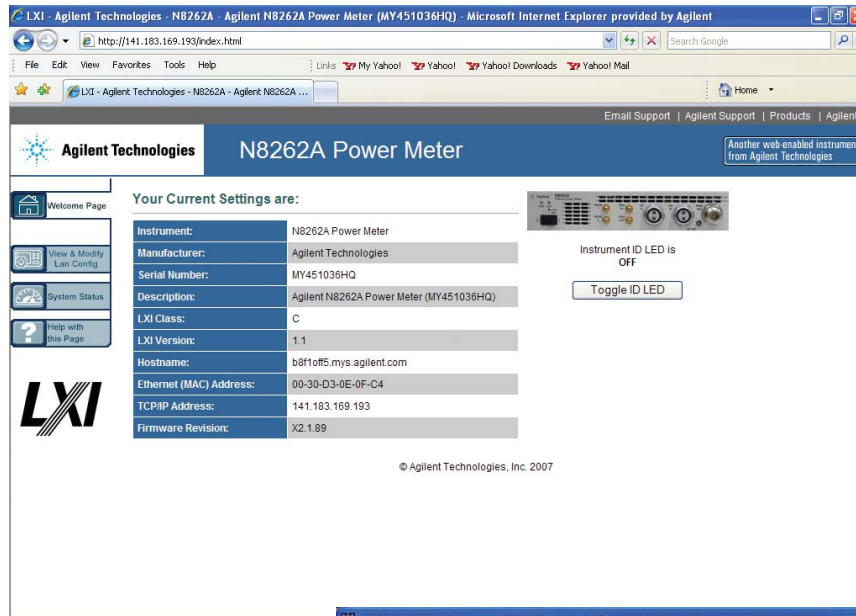


Choose high performance, reliable LAN/GPIB converter and networked USB hub from [www.agilent.com/find/io](http://www.agilent.com/find/io)

## For compact ATE systems

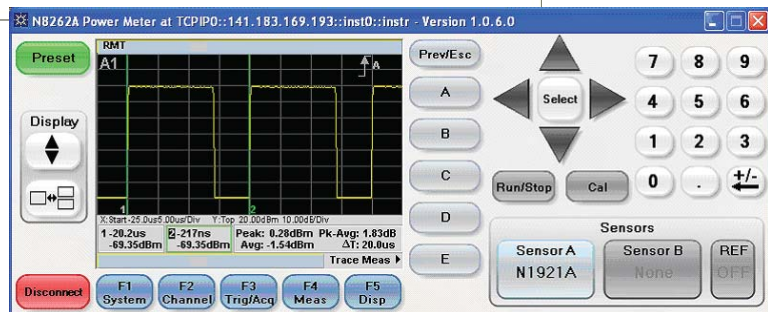
### Remote access and control from anywhere

With the convenience of LAN, neither place nor distance is a limit to power measurements with the N8262A.







Whenever you need to view or modify an N8262A's current proxy settings, you can do so with its built-in Web page.

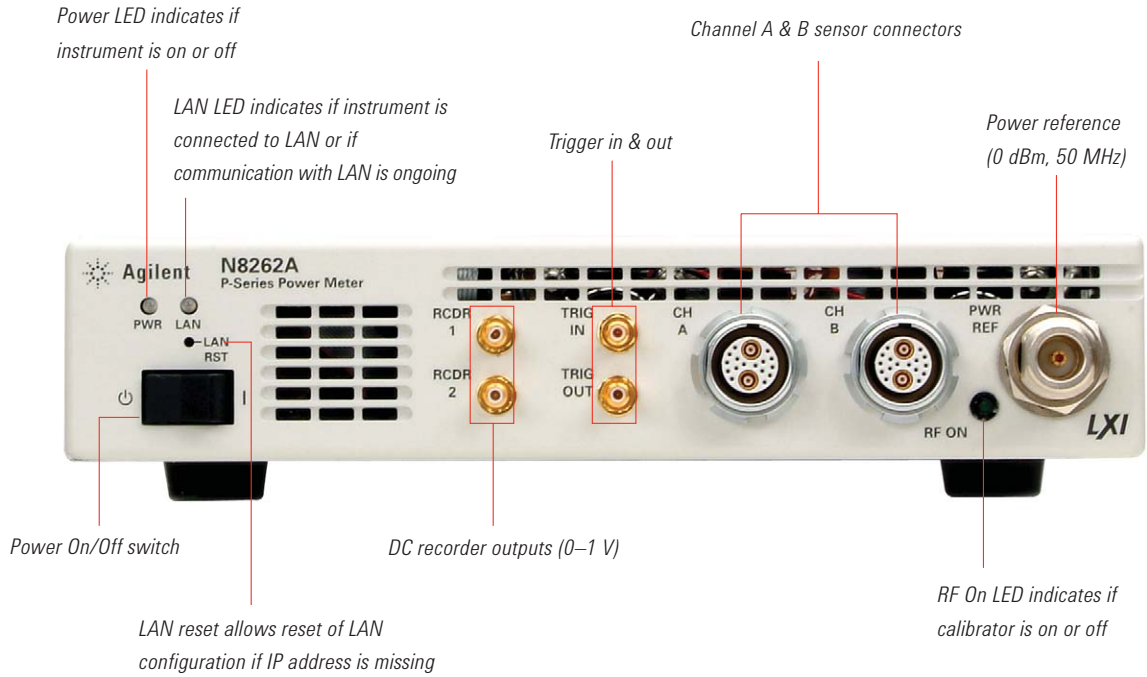
Control an N8262A and view measurement results through the Power Meter GUI soft front panel, the way you would a P-Series power meter from its front panel.



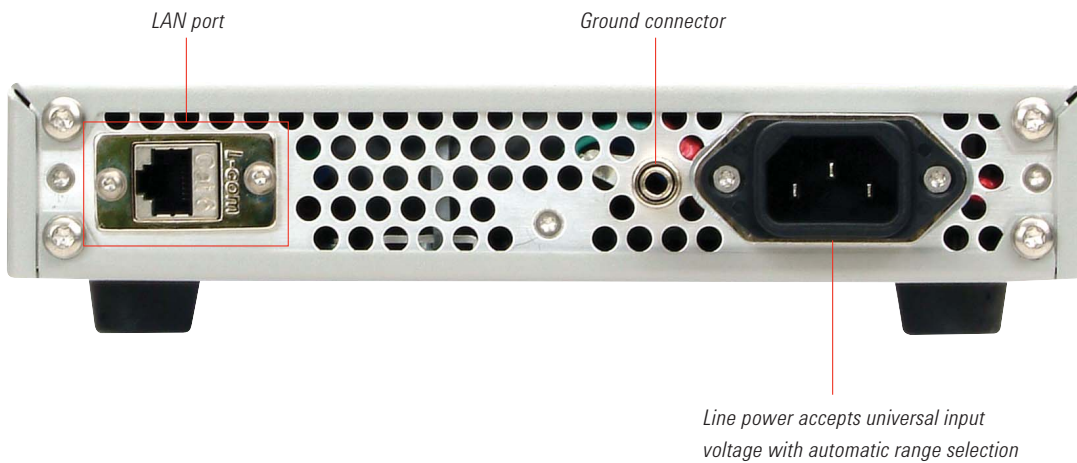
### Compatible power sensors/software

-  P-Series power sensors (50 MHz to 40 GHz; -35 dBm to 20 dBm)
-  E4410 & E9300 E-Series power sensors (9 kHz to 26.5 GHz; -70 dBm to 44 dBm)
-  8480 Series power sensors (100 kHz to 100 GHz; -70 dBm to 44 dBm)
-  N1918A Power Analysis Manager software

### N8262A front panel



### N8262A rear panel



## For effective capture of wireless signals

### Agilent N1911A/12A P-Series power meters

The P-Series power meters are designed for high performance measurement of wireless signals such as WiMAX™ and radar. Predefined settings in the P-Series power meters enable effective capture of unpredictable wireless signals, with their high burst rates and fast, time-varying power levels.



#### Highlights

- ✓ Quick set up with 22 radio presets
- ✓ Automatic pulse capture
- ✓ Wide VBW and high sampling rate
- ✓ High resolution color display

#### Features

##### Models

- Single-channel N1911A
- Dual-channel N1912A

##### Specifications

- 30 MHz video bandwidth
- 100 Msamples/s continuous sampling rate

##### Measurement type

- Peak, average, peak-to-average ratio power measurements
- Time-gated and free-run measurement modes
- CCDF statistical analysis in graphical and tabular formats
- Rise time, fall time, pulse width, time to positive occurrence and time to negative occurrence measurements
- Includes predefined configurations for WiMAX, HSDPA and DME

##### Calibration

- Calibration and correction factors in EEPROM (P-Series and E-Series sensors)
- Internal zeroing and calibration (P-Series sensors) \*Refer to page 9

##### Remote programmability

- SCPI standard interface commands \*Also programmable in other languages. See below
- GPIB, LAN and USB interfaces

##### System-ready software

- Bundled IVI driver enables programming via your choice of environment, including Agilent VEE, LabVIEW, LabWindows, C, C++, and MATLAB

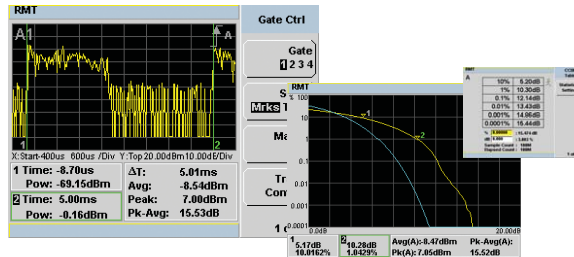
##### Backward-compatibility

- Code-compatible with EPM-P and EPM Series power meters

### High sampling rate for WiMAX and WLAN testing

Apart from WiMAX and WLAN presets, the P-Series power meters also offer 100 Msamples/s continuous sampling that ensures glitches are not missed.

- The P-Series power meters' 30 MHz wide video bandwidth enables the capture of WiMAX signals
- With their auto trigger hold-off capability, you can capture the complete Downlink or Uplink subframe burst desired within a fixed time span
- Time-gated peak, average and peak-to-average ratio power measurements are automatically displayed to ease analysis of signals

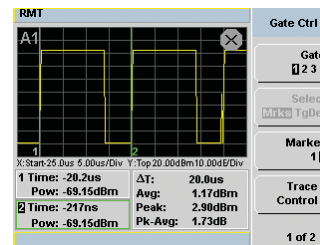


CCDF statistical analysis is viewable in both tabular and graphical formats

### Autoscaling and autogating for radar testing

Setting up for radar signal measurements is faster and easier with the P-Series preset. Capture of a radar pulse is further simplified with autoscaling and autogating functions. With autogating set to "perpetually on," the gates reposition themselves automatically when pulse width changes.

- Up to four independent time gates can be set for individual measurements on one or multiple pulses
- With a frequency range of up to 40 GHz and rise/fall times of  $\leq 13$  ns, you have more than enough to profile high-frequency radar signals in most applications



### Wide video bandwidth for MCPA testing

In designing multi-carrier power amplifiers (MCPA), a wide-bandwidth power meter such as the P-Series helps you ensure that your device stays within its maximum power specification. The P-Series power meter's 30 MHz video bandwidth allows up to six 3G carriers over a wide dynamic range.

**Typical measurements:**

- Tx average power (in burst/time-gated modes)
- Tx peak power (in burst/time-gated modes)
- Tx peak-to-avg ratio (in burst/time-gated modes)
- Tx CCDF
- Gain of amplifier

- CCDF and peak-to-average power measurements verify if MCPA is clipping
- 100 MSamples/s continuous sampling ensures easier detection of glitches
- Rise/fall time measurements help in checking the signal's burst profile and in identifying power transition problems
- High resolution color display ease viewing and differentiation of the four traces

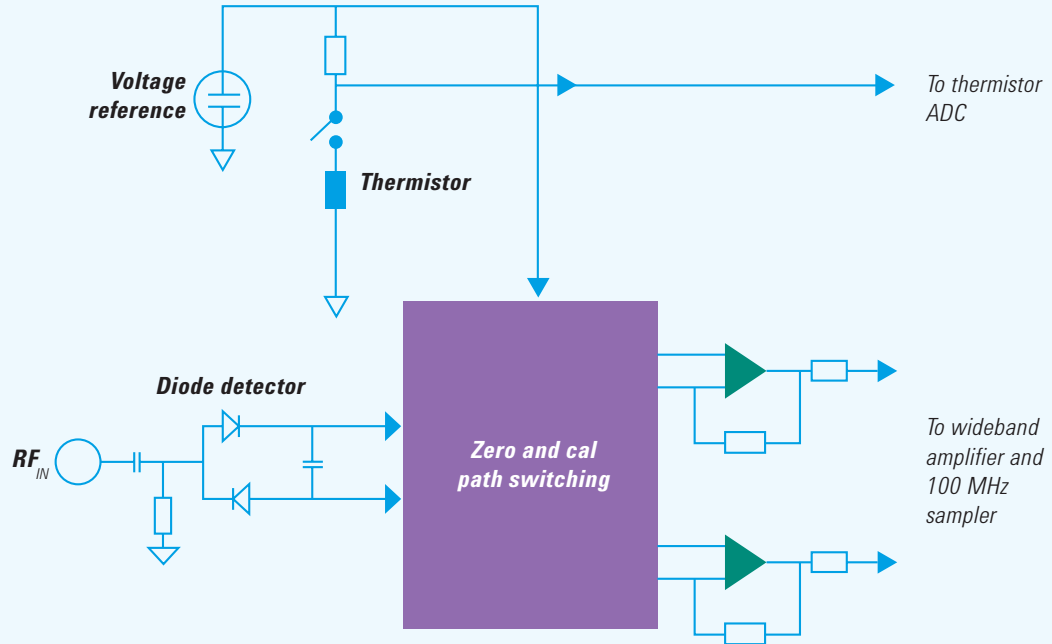
1	Pow: 0.40dB	2-1Δ Pow: 37.80dB
	Prob: 50.1587%	2-1Δ Prob: 50.1587%
2	Pow: 38.20dB	Avg: -46.23dBm
	Prob: 0.0000%	Pk: -21.30dBm
		Pk-Avg: 23.93dBm

A sample setup for MCPA testing

## For effective capture of wireless signals








### The P-Series power sensors' internal zeroing and calibration

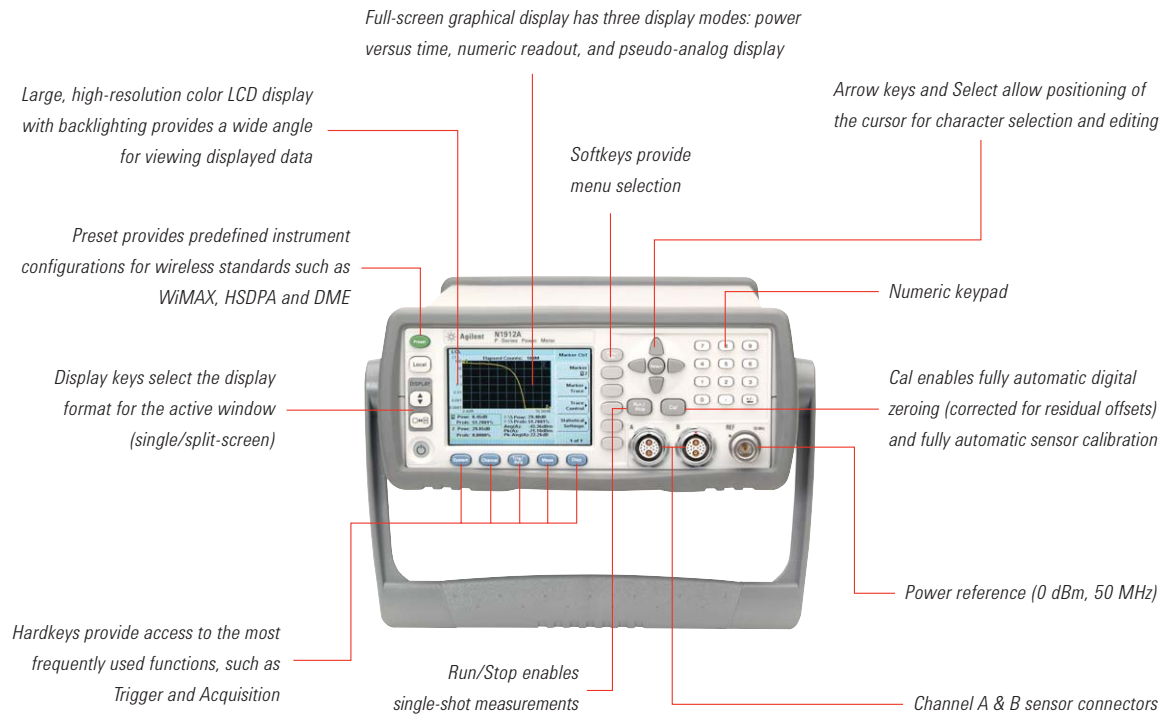


- Integrates DC reference source and switching circuits into sensor
- Eliminates the need for calibration with an external reference source
- Eliminates the need to connect/disconnect from calibration source and test fixtures
- Reduces test times, measurement uncertainty and wear-and-tear on connectors

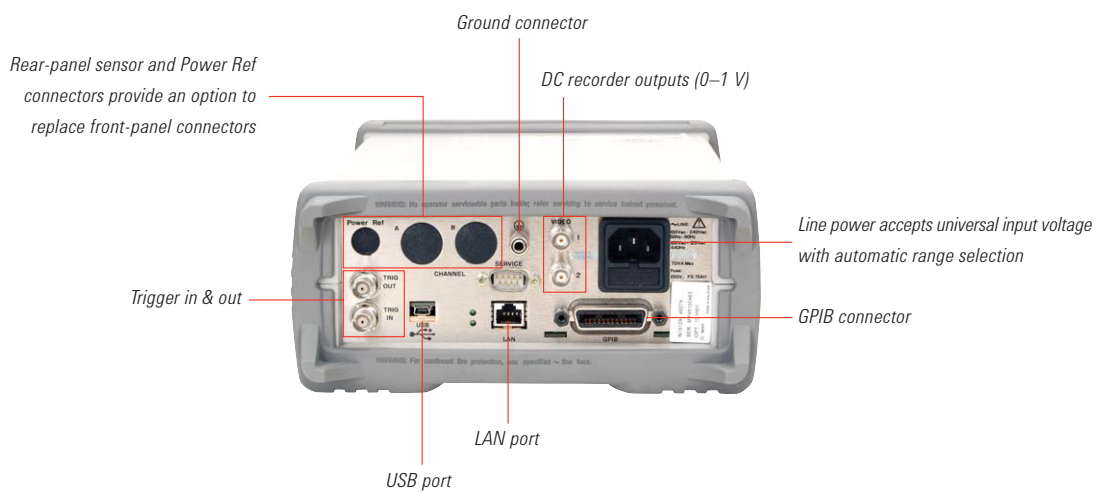
### Compatible power sensors/software

-  P-Series power sensors (50 MHz to 40 GHz;  $-35$  dBm to 20 dBm)
-  E9320 E-Series power sensors (50 MHz to 18 GHz;  $-65$  dBm to 20 dBm)
-  E4410 & E9300 E-Series power sensors (9 kHz to 26.5 GHz;  $-70$  dBm to 44 dBm)
-  8480 Series power sensors (100 kHz to 100 GHz;  $-70$  dBm to 44 dBm)
-  N1918A Power Analysis Manager software

## N1912A front panel



## N1912A rear panel



## For testing of complex modulation formats

### Agilent E4416A/17A EPM-P Series power meters

The EPM-P Series power meters operate with the E9320 Series peak-and-average power sensors for testing various complex modulation formats in wireless communication systems, such as TDMA and CDMA.



#### Highlights

- ✓ Optimize dynamic range for peak power measurement
- ✓ Complete TDMA and CDMA characterization

#### Features

##### Models

- Single-channel E4416A
- Dual-channel E4417A

##### Specifications

- 5 MHz video bandwidth
- 20 Msamples/s continuous sampling rate

##### Measurement type

- Peak, average, peak-to-average ratio power measurements
- Time-gated and free-run measurement modes
- Includes predefined configurations for GSM, EDGE, NADC, iDEN, Bluetooth®, IS-95 CDMA, W-CDMA and cdma2000®

##### Calibration

- Calibration and correction factors in EEPROM (E-Series sensors)

##### Remote programmability

- SCPI standard interface commands
- GPIB, RS-232/422 interfaces

##### Backward-compatibility

- Code-compatible with EPM Series power meters

### Optimize dynamic range with E9320 Series sensors

Wider bandwidths allow you to profile fast-changing signals, but at the expense of dynamic range. That's why each E9320 Series power sensor comes with three variable bandwidth settings. This helps you select the best bandwidth for your application, yet still maintain the widest possible dynamic range.

Sensor model	Video bandwidth/maximum peak power dynamic range			
	Off	High	Medium	Low
E9321A	300 kHz/ -40 dBm to +20 dBm	300 kHz/ -42 dBm to +20 dBm	100 kHz/ -43 dBm to +20 dBm	30 kHz/ -45 dBm to +20 dBm
E9322A	1.5 MHz/ -36 dBm to +20 dBm	1.5 MHz/ -37 dBm to +20 dBm	300 kHz/ -38 dBm to +20 dBm	100 kHz/ -39 dBm to +20 dBm
E9323A	5 MHz/ -32 dBm to +20 dBm	5 MHz/ -32 dBm to +20 dBm	1.5 MHz/ -34 dBm to +20 dBm	300 kHz/ -36 dBm to +20 dBm

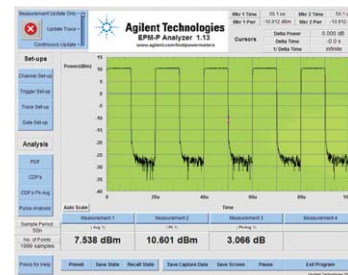
### Complete TDMA/CDMA analysis with bundled analyzer software

#### Pulse analysis

Versatile markers offer complete power and timing characterization of pulsed signals, to provide easy testing of TDMA component parameters and system performance. In addition to measuring peak, average and peak-to-average ratio power, the Agilent EPM-P analyzer software measures the following pulse characteristics automatically:

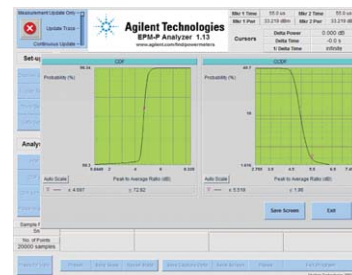
**Power:** pulse top, pulse base, distal, mesial, proximal, overshoot and burst average

**Frequency and time:** Pulse Repetition Frequency (PRF), Pulse Repetition Interval (PRI), pulse width, off-time, rise time and fall time






#### Statistical analysis

For today's noise-like CDMA and W-CDMA formats, statistical analysis of the power distribution helps you optimize system design by providing essential characterizations such as amplifier compression. The Agilent EPM-P analyzer software provides the capability to determine the PDF, CDF and CCDF.



### Compatible power sensors/software

-  E9320 E-Series power sensors (50 MHz to 18 GHz; -65 dBm to 20 dBm)
-  E4410 & E9300 E-Series power sensors (9 kHz to 26.5 GHz; -70 dBm to 44 dBm)
-  8480 Series power sensors (100 kHz to 100 GHz; -70 dBm to 44 dBm)

## For testing of complex modulation formats

### E4417A front panel

Preset provides predefined instrument configurations for common TDMA and CDMA wireless standards such as GSM, EDGE and NADC. Local returns the power meter to local control. If already in local, it returns the power meter to the default condition

Display keys select the display format for the active window (single/split-screen)

Hardkeys provide access to the most frequently used functions, such as Trigger

High-resolution display with backlighting provides a wide angle for viewing displayed data

Softkeys provide menu selection

Two horizontal windows enable display of a large 1- or 4-line numeric display, an analog display or a trace display

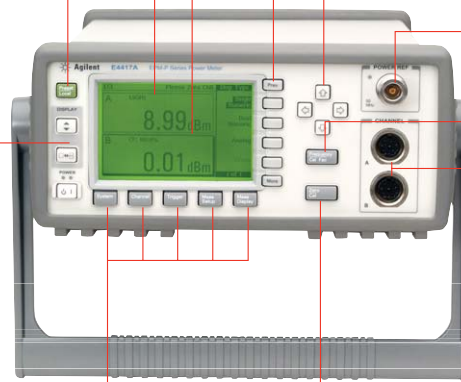
Arrow keys allow positioning of the cursor for character selection and editing

Power reference (0 dBm, 50 MHz)

Frequency allows direct entry of test signal frequency. Cal factor enables sensor frequency response correction (settable from 1% to 200% with 0.1% resolution)

Channel A & B sensor connectors

Zero enables fully automatic digital zeroing (corrected for residual offsets). Cal enables fully automatic sensor calibration



### E4417A rear panel

Rear-panel sensor and Power Ref connectors provide an option to replace front-panel connectors

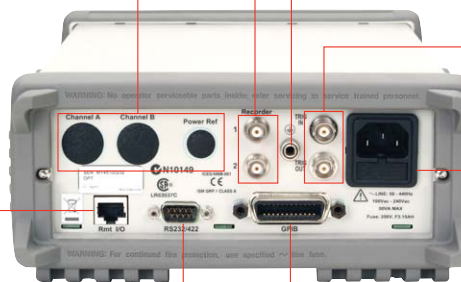
Remote input/output provides a TTL logic level output when a measurement exceeds a predetermined limit, and accepts TTL inputs for initiation of zero and calibration cycles

DC recorder outputs (0–1 V)

Ground connector

Trigger in & out

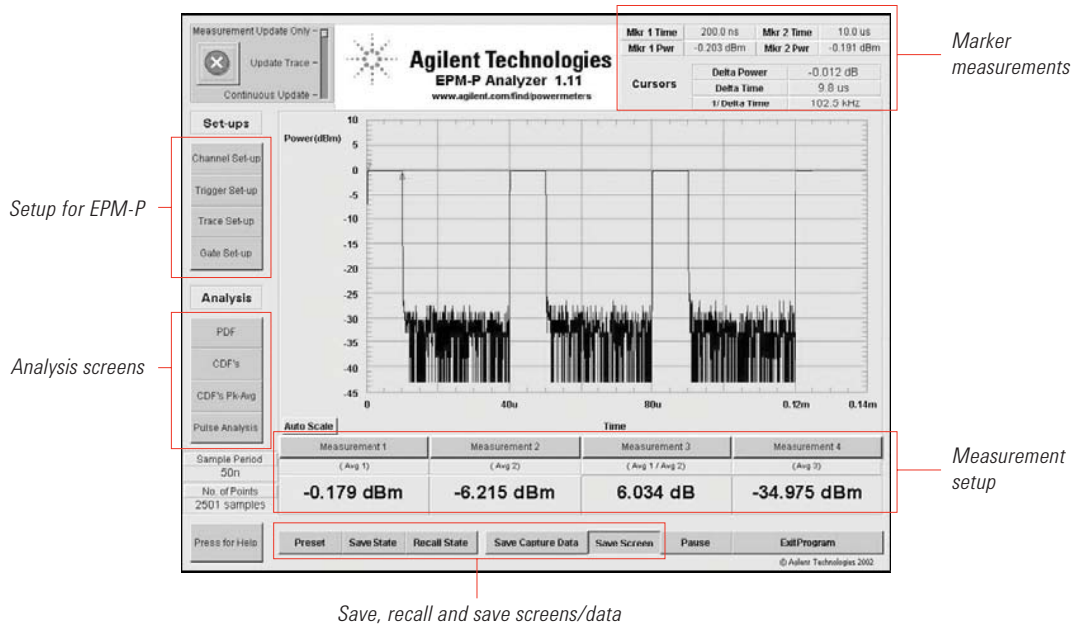
Line power accepts universal input voltage with no range selection switches



GPIO connector

RS232/422 connector

## EPM-P analyzer software



### Setups for EPM-P

This software controls the power meter and is used to set up the Channel, Trigger and Gate Setups as shown through the front panel.

### Analysis screens

After the power meter is configured, the trace is captured to allow for analysis of the captured trace data. There are various analysis screens covering statistical analysis such as Probability Density Function (PDF) and Complementary Cumulative Distribution Function (CCDF or 1-CDF) measurements and pulse analysis.

### Marker measurements

When the trace is captured, the marker measurements can be used to provide time and power information, and the trace can also be zoomed in on to look closely at areas of interest.

### Measurement setup

The display can show up to four real-time power measurements, which are configured in a similar manner to the power meter display, and allows time-gated average, peak, peak-to-average ratio measurements, as well as combination measurements to be displayed.

### Save, recall and save screens/data

If the analyzer display is required for reports or import into other applications, the screen can be saved as a JPG or BMP file and the power and time data from the captured trace can also be saved in a CSV file. The analyzer software allows 10 states to be stored and recalled. This ensures easy set up of the analyzer software and allows repeatable measurements to be obtained. These states are saved in a separate file, and stored on the PC or a disc, ensuring users on different PCs are operating the same setups and therefore making the same measurements.

## For flexible testing: on the rack and on the go

### Agilent E4418B/19B EPM Series power meters

The EPM Series power meters are designed with functions and options that make them ideal for both bench/rack and field measurements.



#### Features

##### Models

- Single-channel E4418B
- Dual-channel E4419B

##### Measurement type

- Average power measurements

##### Calibration

- Calibration and correction factors in EEPROM (E-Series sensors)

#### Highlights

- ✓ Clear readings in subdued lighting
- ✓ Easy viewing of readings from a distance
- ✓ Convenient field usage with operating case and battery option

#### Remote programmability

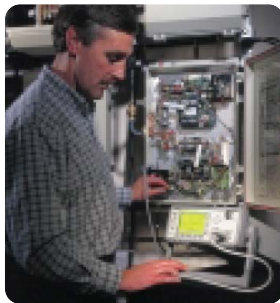
- SCPI standard interface commands
- GPIB, RS-232/422 interfaces

#### Out-of-box software

- EPM-P analyzer software

#### Backward-compatibility

- Code-compatible with 436A, 437B (E4418B only) and 438A (E4419B only) power meters



#### View measurements better in any lighting and angle

Each EPM Series power meter comes with a high resolution backlit display. With its wide viewing angle, you can see the large characters and digits, or the analog peaking meter, from a distance.



#### Perform field measurements conveniently

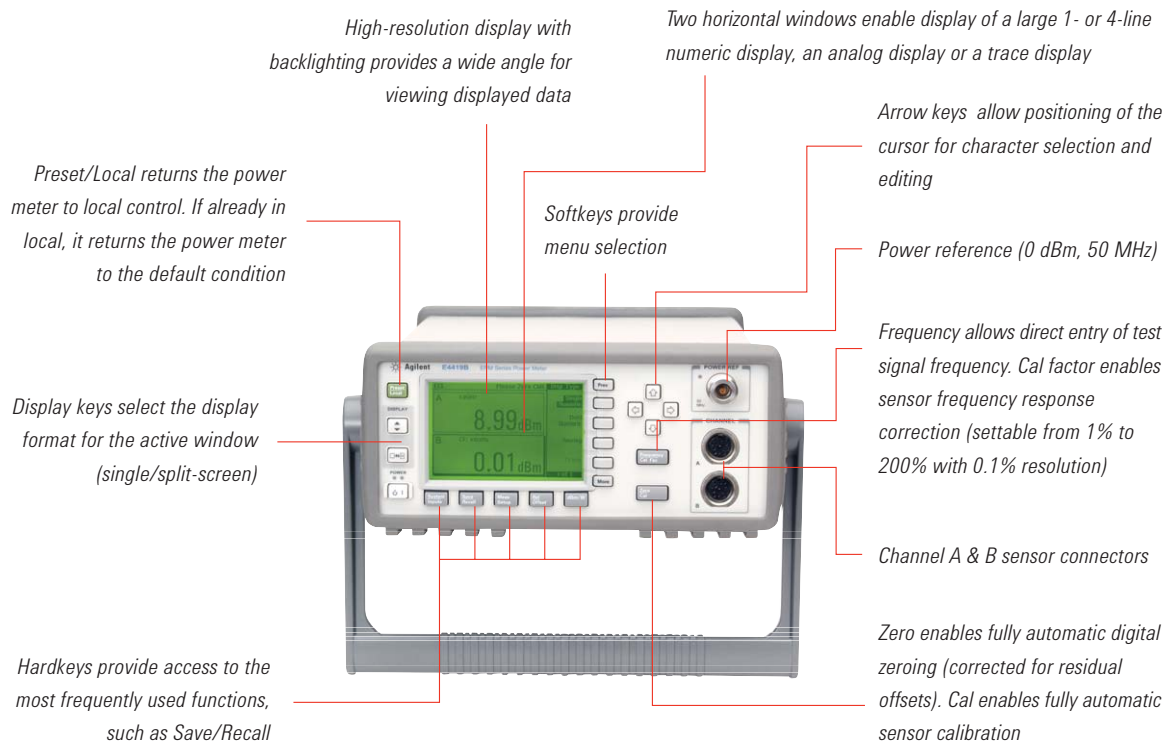
You can easily carry an EPM Series power meter in its operating case when you need to travel between stations. The EPM Series power meter is also available with an internal rechargeable battery (Option 001) so you can keep your power meter at its optimum capacity before your next round of on-the-go measurements.



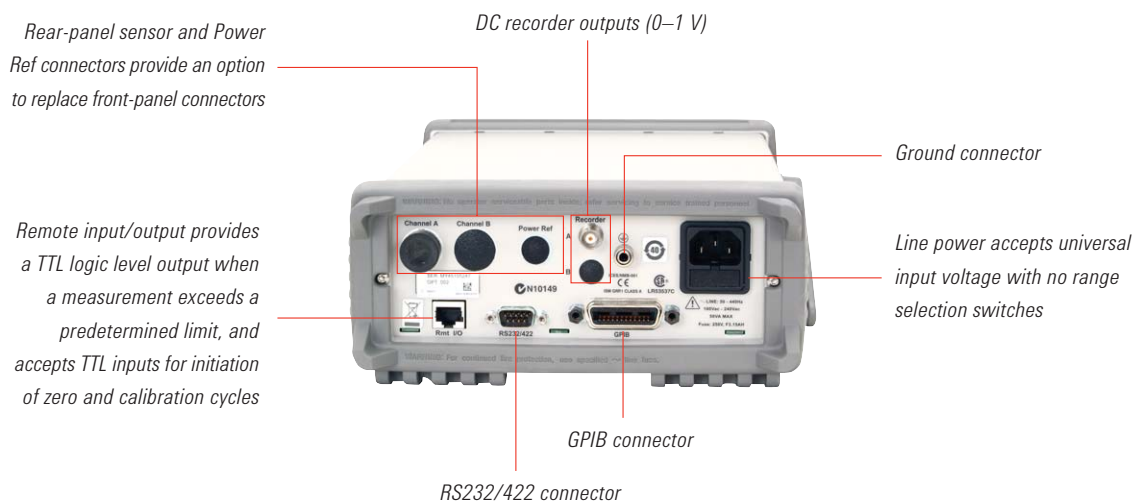
#### Compatible power sensors/software

- 
 E4410 & E9300 E-Series power sensors (9 kHz to 26.5 GHz; -70 dBm to 44 dBm)
- 
 8480 Series power sensors (100 kHz to 100 GHz; -70 dBm to 44 dBm)

### E4419B front panel



### E4419B rear panel



## For mobile testing that's plug-and-play easy

### Agilent U2000 Series USB power sensors

Standalone USB-based U2000 Series power sensors enable power measurements without power meters. Using USB power and providing built-in triggering, these power sensors don't need external power adapters or triggering modules for synchronization with external instruments or events. All these make the U2000 Series an ideal choice for high performance mobile power measurements.

#### Highlights

- ✓ Set up easily with USB connectivity
- ✓ Save time connecting/disconnecting sensor with internal zeroing
- ✓ Measure from practically anywhere, beyond USB cable length
- ✓ Travel with lighter-weight solutions
- ✓ Add power measurements to other instruments

#### Features

##### Measurement type

- Average power measurements

##### Remote programmability

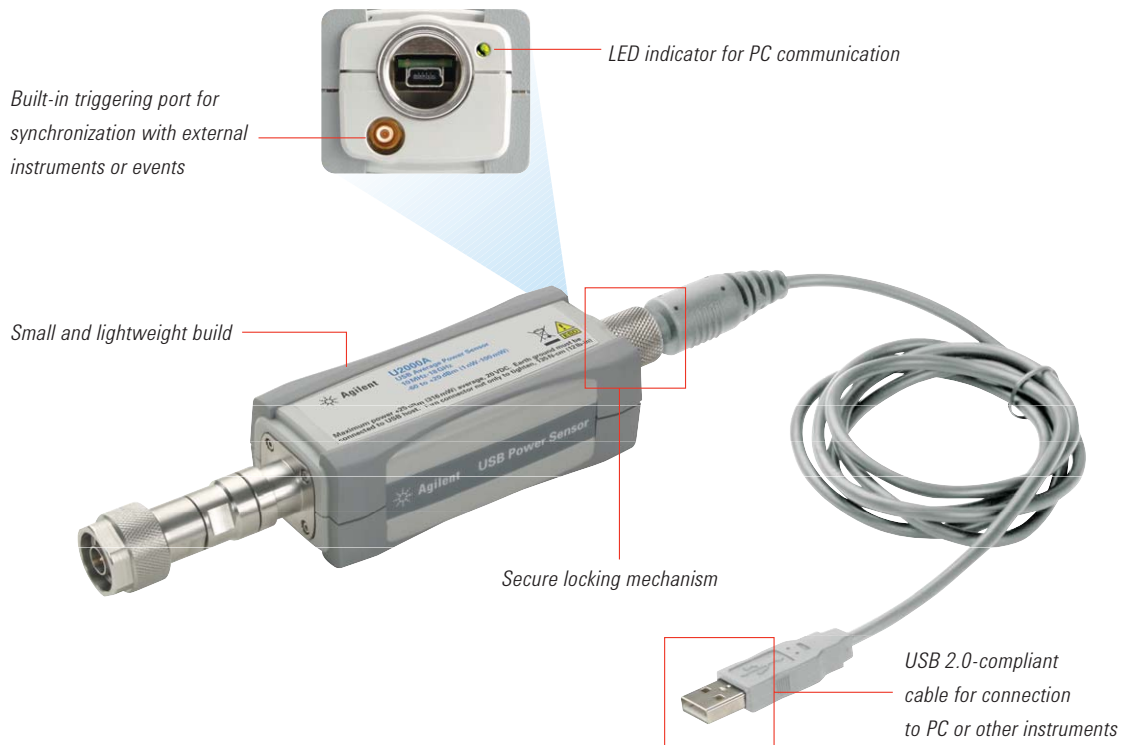
- USB interface

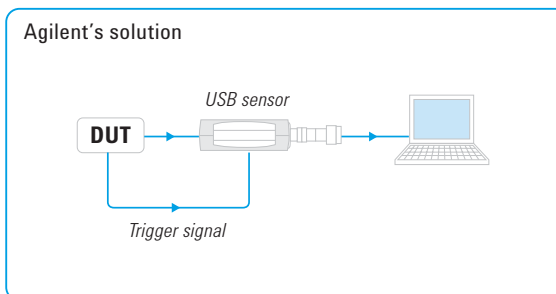
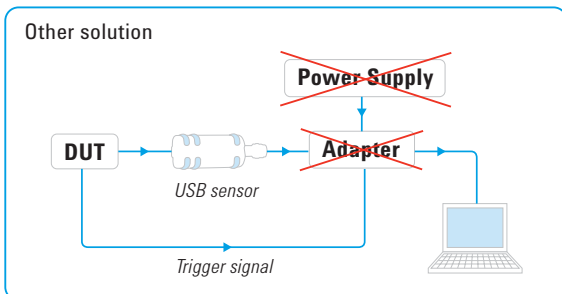
##### System-ready software

- N1918A Power Analysis Manager software

##### Backward-compatibility

- Code-compatible with E4418B EPM Series power meter





A U2000 USB power sensor's setup is simple, unlike the complicated setup of other USB-based power measurement solutions



**Start your tasks sooner with quick set up**

Just plug a U2000 Series sensor's cable into your PC, or selected Agilent instrument, and start your measurements with the N1918A Power Analysis Manager software.

**Reduce sensor connection/disconnection**

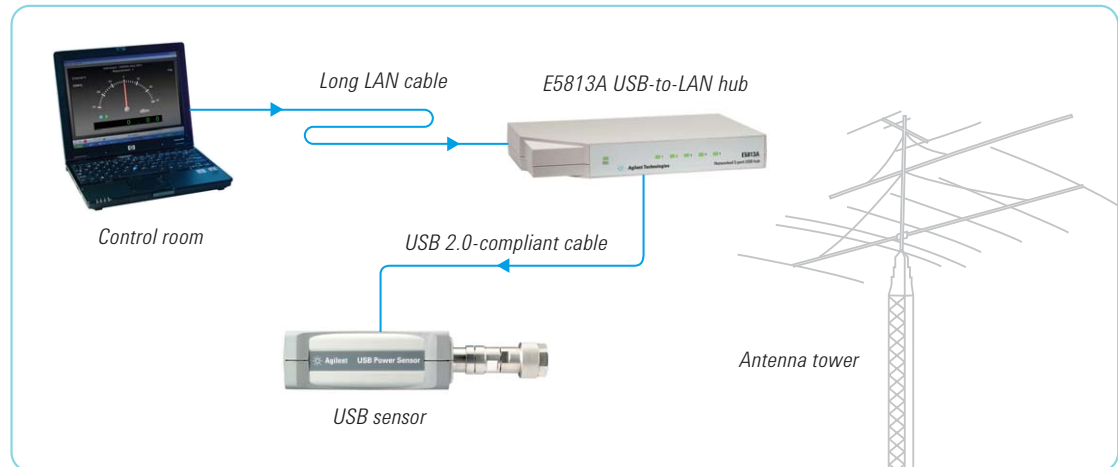
With a U2000 Series sensor's internal zeroing capability, you don't need to power-off the device-under-test or disconnect the sensor. This saves test time and reduces sensor wear-and-tear—advantages that are especially crucial in applications where every second counts, such as manufacturing test. With internal zeroing, the sensor can be left connected to the test fixture.



## For mobile testing that's plug-and-play easy

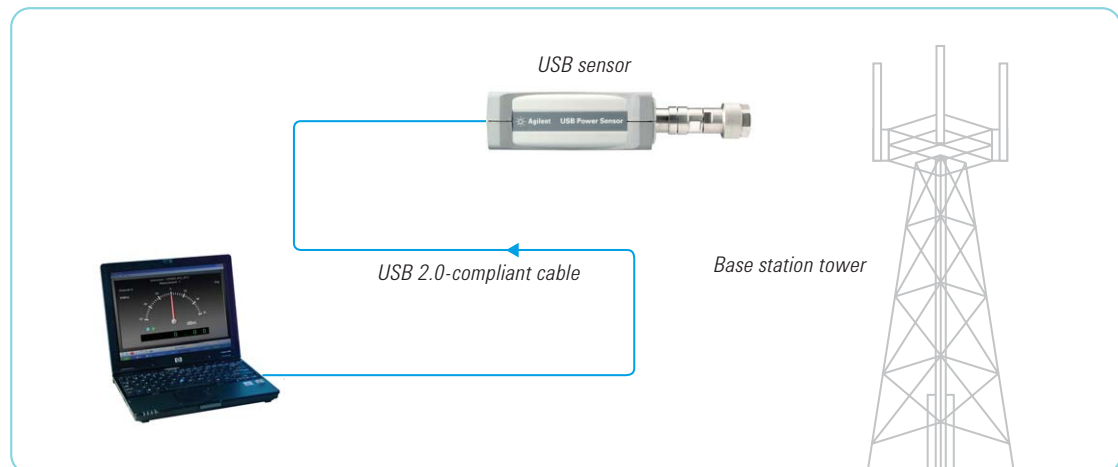
### Perform antenna testing across any distance

When a U2000 Series sensor's USB cable is connected to the Agilent E5813A USB-to-LAN hub, you can perform measurements beyond the limits of USB cable length. Conveniently leave your sensor connected to the power tap-off—even while performing zeroing—and monitor your measurements remotely.



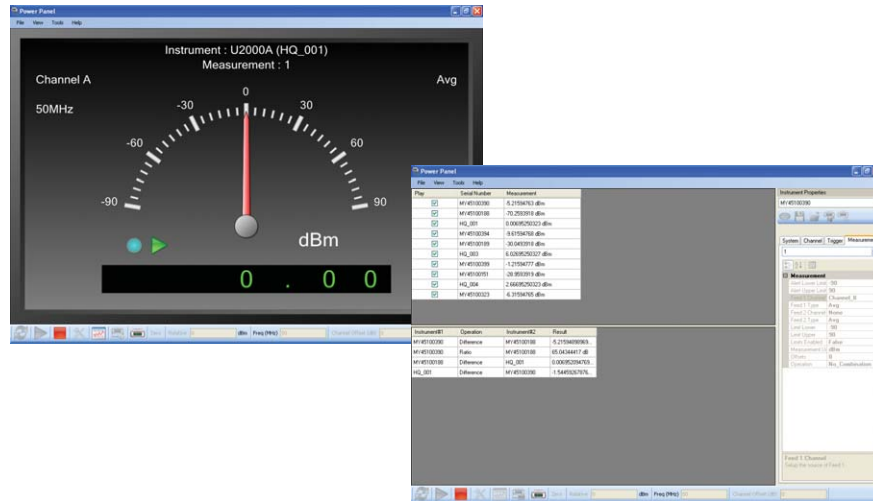
### Perform base station testing without the usual bulkiness

When you need to take power measurements on the road or up a base station tower, smaller, lighter and fewer is better. With the U2000 Series USB power sensors, the only other thing you'll need is a laptop with the N1918A Power Analysis Manager installed.



### View multiple display formats, set limits and alerts, and more...

The N1918A Power Analysis Manager software displays measurements with the U2000 Series power sensors. Besides monitoring signals, this feature-packed software also enables further analysis through functions such as waveform math, autoscaling, zooming, recording and playback.



### Add power measurements to other instruments

Sometimes you may want to perform accurate average power measurements with an Agilent signal source, network analyzer or spectrum analyzer. You could literally have a power meter next to you—or instead, turn select Agilent instruments into power meters with the U2000 Series. Even with the U2000 connected, you can switch between power measurements and the instrument's original function at any time.



### Compatible power sensors/software



N1918A Power Analysis Manager software

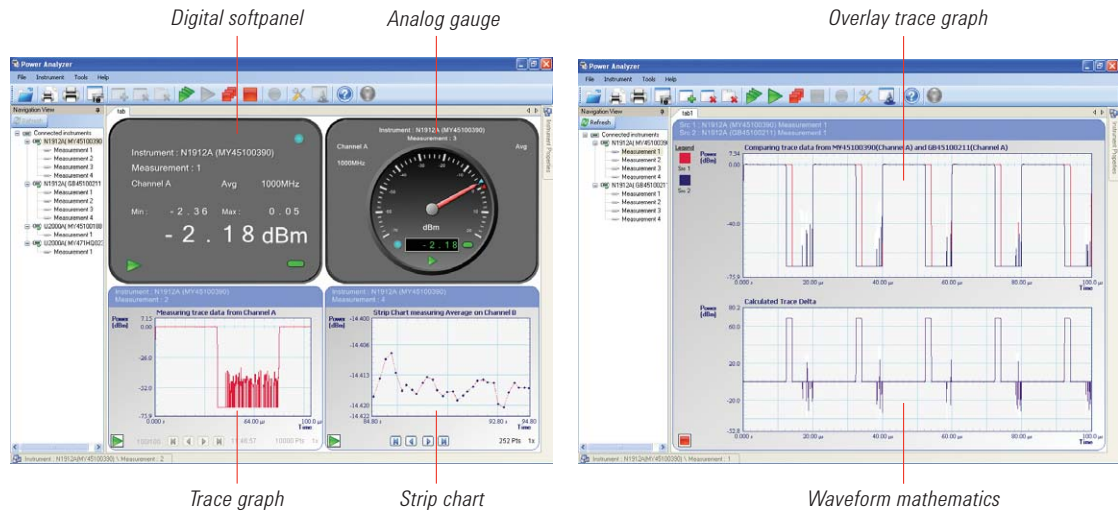
## For easy monitoring and troubleshooting

### N1918A Power Analysis Manager

The N1918A Power Analysis Manager is compatible with the U2000 Series USB power sensors, N1911/12A P-Series power meters and N8262A P-Series modular power meter. This feature-packed software not only enables performance monitoring and data collection, but also simplifies post-data analysis and speeds up troubleshooting.

#### Highlights

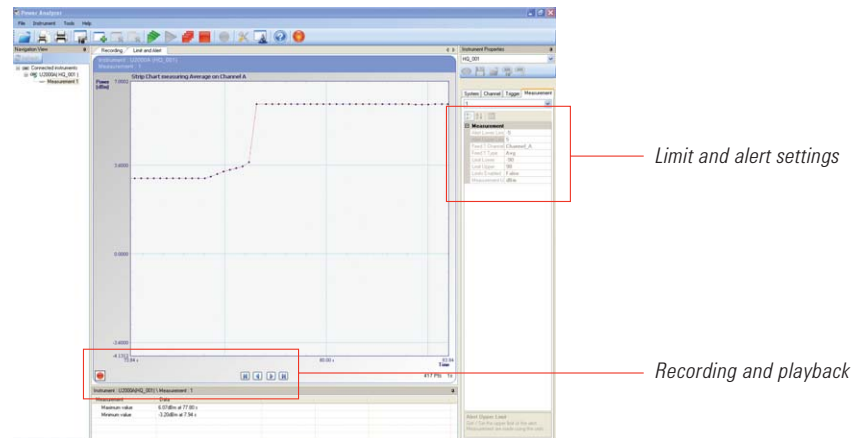
- ✔ Multiple viewing types, including multiple-channel list (> 10 channels)
- ✔ Overlay trace graph and waveform mathematics for easy signals computation
- ✔ Recording and playback for easy troubleshooting
- ✔ Limit and alert settings for multiple channels monitoring
- ✔ Complete 15-point pulse characterization for peak power analysis
- ✔ PDF, CDF and CCDF tables and graphs for statistical analysis



Trace graph

Strip chart

Waveform mathematics



Limit and alert settings

Recording and playback

## Features

The N1918A software is available in two versions: the basic Power Panel and the advanced Power Analyzer, which provides full access to the software's complete features and capabilities. Power Panel can be accessed immediately upon installation, while Power Analyzer's license (N1918A Option 100) is available separately.

	Power Panel (basic)	Power Analyzer (advanced)
<b>Measurement display types</b>		
Digital Softpanel	✓	✓ (enhanced)
Gauge	✓	✓ (enhanced)
Strip chart	✓	✓ (enhanced)
Trace graph	✗	✓
Multiple-channel list	✓	✗
Multiple tabs	✗	✓
<b>Graph functions</b>		
Autoscaling	✓	✓
Zooming	✗	✓
Measurement mathematics	✓	✗
<b>Pulse characterization functions*</b>		
15-point pulse characterization	✗	✓
Overlay trace graph	✗	✓
Waveform mathematics	✗	✓
<b>Statistical analysis function*</b>		
Graph and tabular formats for PDF/CDF/CCDF analysis	✗	✓
<b>Save/load functions</b>		
Save measurement data	✓	✓
Load measurement data	✓	✓
Data recording	✗	✓ (up to seven days)
Save instrument screen image	✓	✓
Save and restore instrument settings	✓	✓
<b>Limit &amp; alert functions</b>		
Limit and alert notification	✗	✓
Alert summary	✗	✓
<b>Print function</b>		
Print application screen	✗	✓
<b>Instrument Compatibility</b>	Compatible with U2000 Series USB power sensors, N1911A/12A P-Series power meters and N8262A P-Series modular power meter	

\* Applies only to N8262A and N1911A/12A P-Series power meters

## Selection guide for wireless communications

### Peak Power Measurement



**EPM-P E4416A/17A**  
(VBW: 5 MHz)

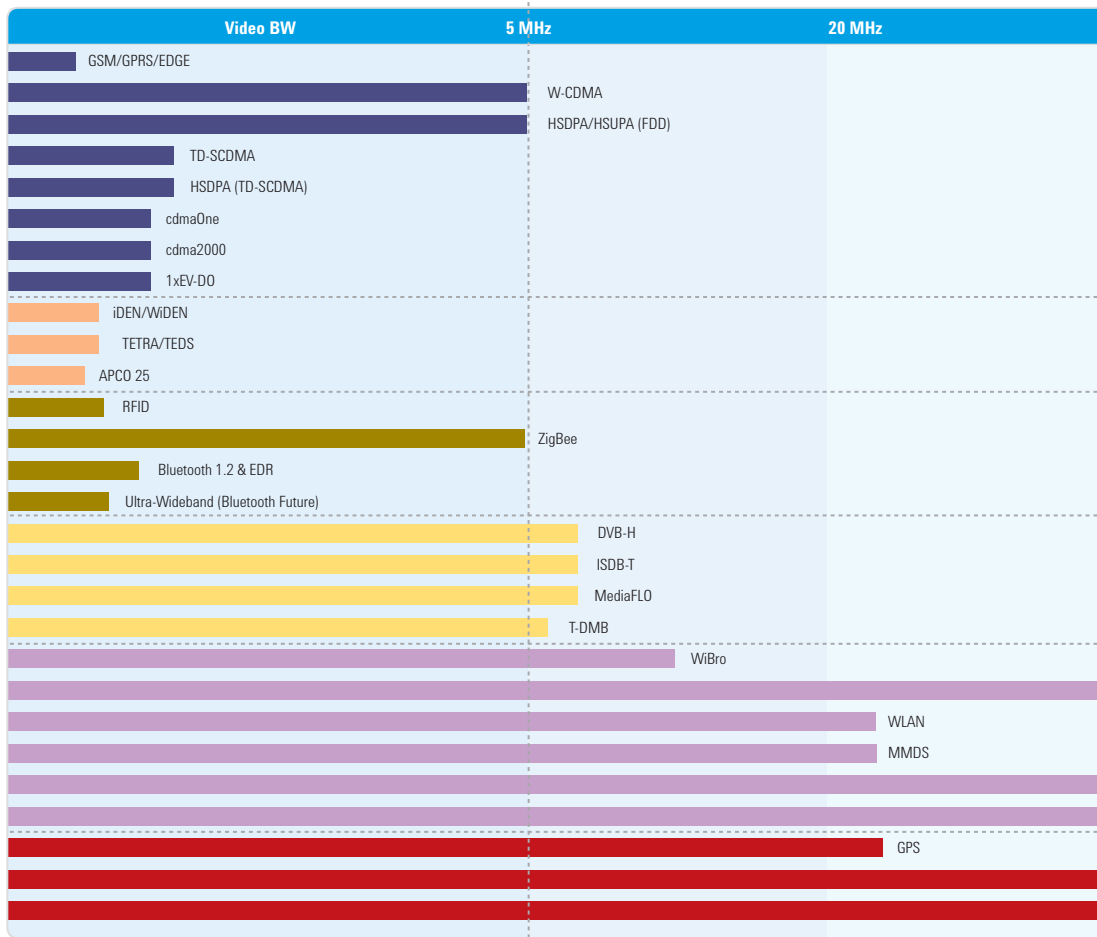
#### Power sensor options

- E932x Peak and Average Sensors (300 kHz, 1.5 MHz, 5 MHz)
- \* Also compatible with all average power sensors*

**P-Series N1911A/12A**  
(VBW: 30 MHz)

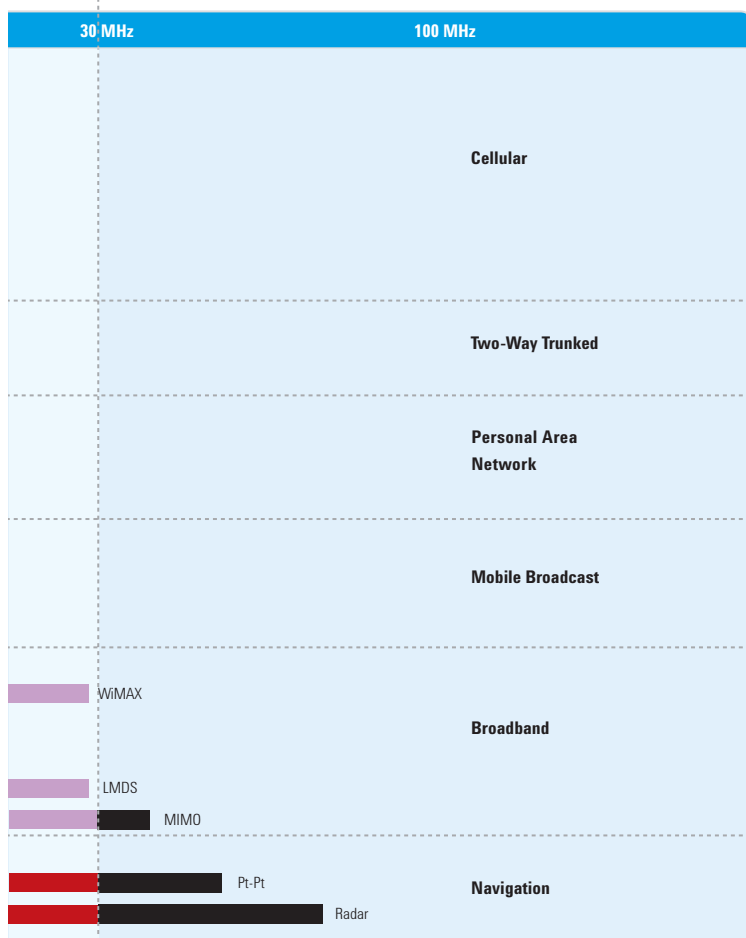


**P-Series modular N8262A**  
(VBW: 30 MHz)



■ Accuracy warranted up to 30 MHz

- Power sensor options**
- N192x Peak and Average Sensors (30 MHz)
  - E932x Peak and Average Sensors (300 kHz, 1.5 MHz, 5 MHz) (for P-Series N1911A/12A)
- \* Also compatible with all average power sensors*



**Average Power Measurement**

**EPM E4418B/19B**



**Power sensor options**

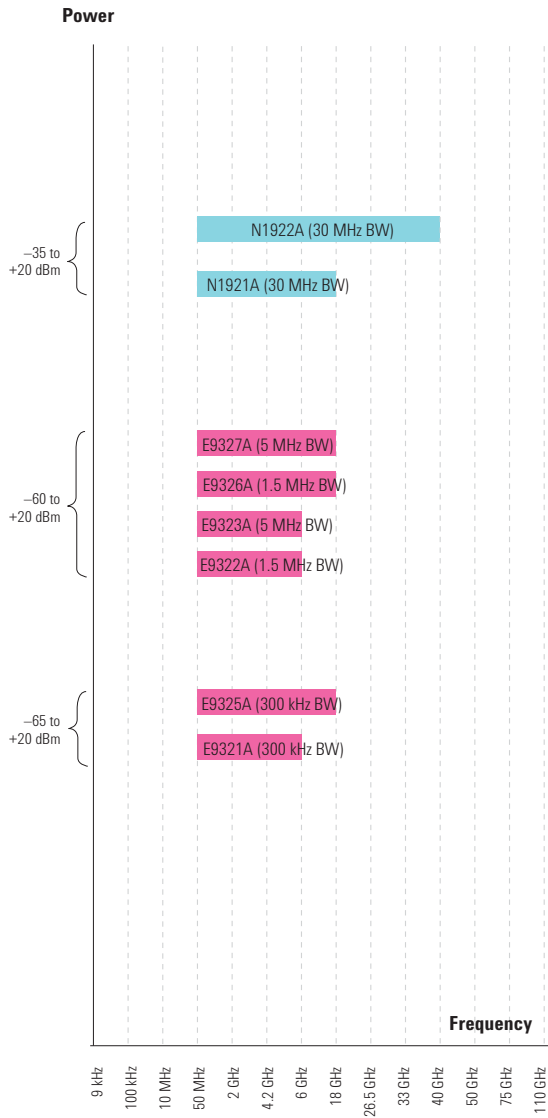
- 848x Diode Sensors
- 848x Thermocouple Sensors
- E441x 1-Path Diode CW-only Sensors
- E930x 2-Path Diode True-Average Sensors

**U2000 Series USB power sensors**



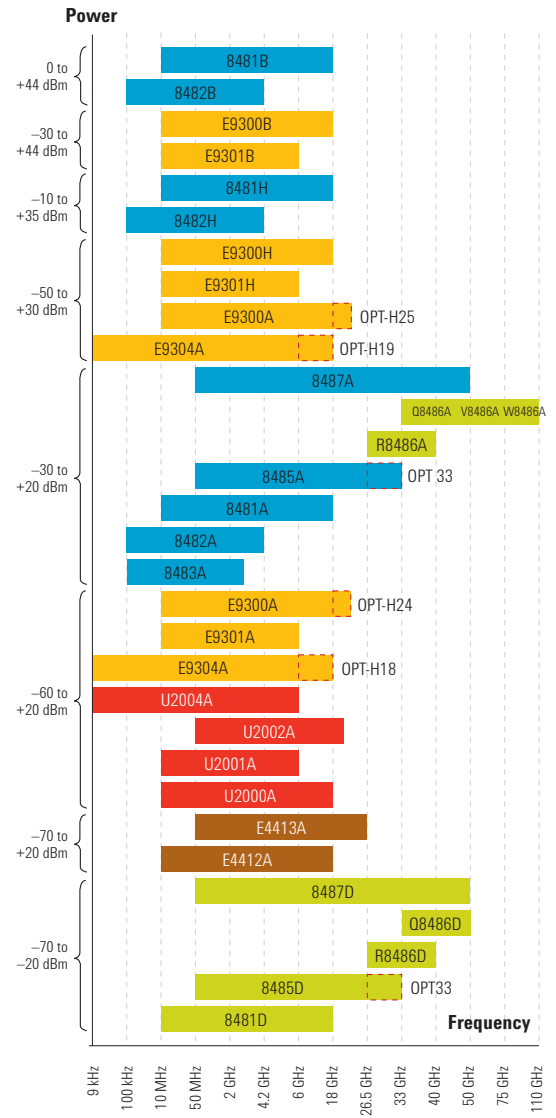
# Selection guide for wireless communications

**Peak-and-average power sensors  
(breakdown by dynamic range)**



- Legend**
- N192x Peak and Average Sensors
  - \* Compatible with P-Series power meters
  - E932x Peak and Average Sensors
  - \* Compatible with EPM-P and P-Series power meters

**Average power sensors  
(breakdown by dynamic range)**



- Legend**
- 848x Diode Sensors
  - 848x Thermocouple Sensors
  - E441x 1-Path Diode CW-only Sensors
  - E930x 2-Path Diode True-Average Sensors
  - \* Compatible with EPM, EPM-P and P-Series power meters
  - U200x USB Sensors

# Specifications

## Power meters summary specifications

Power Meter	Modular P-Series	P-Series
	For compact ATE systems	For effective capture of wireless signals
VBW	30 MHz	30 MHz
Sampling rate	100 Msamples/s	100 Msamples/s
Compatible power sensor/software		
P-Series N1921A/22A	•	•
E-Series E9320	—	•
E-Series E9300	•	•
E-Series E4410	•	•
8480 Series	•	•
N1918A Power Analysis Manager software	•	•

Power Meter	EPM-P Series	EPM Series	U2000 Series
	For testing of complex modulation formats	For flexible testing: on the rack and on the go	For mobile testing that's plug-and-play easy
VBW	5 MHz	—	—
Sampling rate	20 Msamples/s	—	—
Compatible power sensor/software			
P-Series N1921A/22A	—	—	—
E-Series E9320	•	—	—
E-Series E9300	•	•	—
E-Series E4410	•	•	—
8480 Series	•	•	—
N1918A Power Analysis Manager software	—	—	•

## Specifications

### Power sensors summary specifications

Power sensors	Model	Video bandwidth	Frequency range	Power range
P-Series wideband power sensors	N1921A	30 MHz	50 MHz to 18 GHz	-35 dBm to +20 dBm (320 nW to 100 mW)
	N1922A	30 MHz	50 MHz to 40 GHz	-35 dBm to +20 dBm (320 nW to 100 mW)
E-Series peak-and-average power sensors	E9321A	300 kHz	50 MHz to 6 GHz	-65 dBm to +20 dBm (320 pW to 100 mW)
	E9322A	1.5 MHz	50 MHz to 6 GHz	-60 dBm to +20 dBm (1 nW to 100 mW)
	E9323A	5 MHz	50 MHz to 6 GHz	-60 dBm to +20 dBm (1 nW to 100 mW)
	E9325A	300 kHz	50 MHz to 18 GHz	-65 dBm to +20 dBm (320 pW to 100 mW)
	E9326A	1.5 MHz	50 MHz to 18 GHz	-60 dBm to +20 dBm (1 nW to 100 mW)
	E9327A	5 MHz	50 MHz to 18 GHz	-60 dBm to +20 dBm (1 nW to 100 mW)
E-Series CW power sensors	E4412A	—	10 MHz to 18 GHz	-70 dBm to +20 dBm (100 pW to 100 mW)
	E4413A	—	50 MHz to 26.5 GHz	-70 dBm to +20 dBm (100 pW to 100 mW)
E-Series average power sensors	E9300A	—	10 MHz to 18 GHz	-60 dBm to +20 dBm (1 nW to 100 mW)
	E9301A	—	10 MHz to 6 GHz	-60 dBm to +20 dBm (1 nW to 100 mW)
	E9304A	—	9 kHz to 6 GHz	-60 dBm to +20 dBm (1 nW to 100 mW)
	E9300B	—	10 MHz to 18 GHz	-30 dBm to +44 dBm (1 $\mu$ W to 25 W)
	E9301B	—	10 MHz to 6 GHz	-30 dBm to +44 dBm (1 $\mu$ W to 25 W)
	E9300H	—	10 MHz to 18 GHz	-50 dBm to +30 dBm (10 nW to 1 W)
	E9301H	—	10 MHz to 6 GHz	-50 dBm to +30 dBm (10 nW to 1 W)
8480 Series average power sensors	8481A	—	10 MHz to 18 GHz	-30 dBm to +20 dBm (1 $\mu$ W to 100 mW)
	8482A	—	100 kHz to 4.2 GHz	-30 dBm to +20 dBm (1 $\mu$ W to 100 mW)
	8483A	—	100 kHz to 2 GHz	-30 dBm to +20 dBm (1 $\mu$ W to 100 mW)
	8485A	—	50 MHz to 26.5 GHz	-30 dBm to +20 dBm (1 $\mu$ W to 100 mW)
	8487A	—	50 MHz to 50 GHz	-30 dBm to +20 dBm (1 $\mu$ W to 100 mW)
	8481H	—	10 MHz to 18 GHz	-10 dBm to +35 dBm (100 $\mu$ W to 3 W)
	8482H	—	100 kHz to 4.2 GHz	-10 dBm to +35 dBm (100 $\mu$ W to 3 W)
8480 Series high power sensors	8481B	—	10 MHz to 18 GHz	0 dBm to +44 dBm (1 mW to 25 W)
	8482B	—	100 kHz to 4.2 GHz	0 dBm to +44 dBm (1 mW to 25 W)
8480 Series diode power sensors	8481D	—	10 MHz to 18 GHz	-70 dBm to -20 dBm (100 pW to 10 $\mu$ W)
	8485D	—	50 MHz to 26.5 GHz	-70 dBm to -20 dBm (100 pW to 10 $\mu$ W)
	8487D	—	50 MHz to 50 GHz	-70 dBm to -20 dBm (100 pW to 10 $\mu$ W)
U2000 Series USB power sensors	U2000A	—	10 MHz to 18 GHz	-60 dBm to +20 dBm (1 nW to 100 mW)
	U2001A	—	10 MHz to 6 GHz	-60 dBm to +20 dBm (1 nW to 100 mW)
	U2002A	—	50 MHz to 24 GHz	-60 dBm to +20 dBm (1 nW to 100 mW)
	U2004A	—	9 kHz to 6 GHz	-60 dBm to +20 dBm (1 nW to 100 mW)

\*Also available: Waveguide sensors with frequency range up to 110 GHz

## Services and Support



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## Related Application Notes

Application note	Literature number
Internal Zeroing and Calibration for P-Series Power Sensors	5989-6509EN
P-series Power Meter WiMAX Measurement Application	5989-6423EN
4 Steps for Making Better Power Measurements	5965-8167EN
Choosing the Right Power Meter and Sensor	5968-7150E
Fundamentals of RF and Microwave Power Measurements, AN 1449-1	5988-9213EN
Fundamentals of RF and Microwave Power Measurements, AN 1449-2	5988-9214EN
Fundamentals of RF and Microwave Power Measurements, AN 1449-3	5988-9215EN
Fundamentals of RF and Microwave Power Measurements, AN 1449-4	5988-9216EN
Agilent EPM-P Series Power Meters Used in Radar and Pulse Applications, AN 1438	5988-8522EN

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#### Instruments



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