Keysight Technologies
EPM and EPM-P Series Power Meters
E-Series Power Sensors

Configuration Guide
Introduction

This configuration guide describes the standard configurations, options, and compatible accessories of EPM Series and EPM-P Series power meters. For full specifications, see EPM Series Power Meters E-Series and 8480 Series Power Sensors - Data Sheet (Keysight literature number 5965-6382E) or E4416A/E4417A EPM-P Series Power Meters and E-Series E9320 Peak and Average Power Sensors – Data Sheet (Keysight literature number 5980-1469E). Contact your local Keysight Technologies, Inc. representative at the offices listed on the back of this guide if you need more information.

EPM Series power meters
- N1913A power meter (single channel)
- N1914A power meter (dual channel)

EPM-P Series power meters
- E4416A power meter (single channel)
- E4417A power meter (dual channel)

E-Series power sensors
- E441xA CW power sensors (10 MHz to 26.5 GHz, sensor dependent)
- E9300 average power sensors (9 kHz to 18 GHz, sensor dependent)
- E9320 peak and average power sensors (50 MHz to 18 GHz, sensor dependent)
EPM-P Series Power Meters

The EPM-P Series power meters provide peak, peak-to-average ratio, average, and time-gated power measurements. For peak, peak-to-average ratio, and time-gated measurements, the EPM-P Series power meters must operate with the E-Series E9320 power sensors. For average power measurements only, the EPM-P Series power meters are compatible with all the 8480 Series power sensors, the E-Series CW, the E-Series E9300 average power sensors, and the E-Series E9320 power sensors.

The standard E4416A and E4417A power meters include:
- Single-channel power meter, order E4416A or dual-channel power meter, order E4417A
- Input sensor connector(s) on the front panel
- Reference calibrator connector on the front panel
- Power sensor cable, 1.5 m (5 ft). (One per E4416A, two per E4417A)
- Libraries Media Suite CD-ROM
- Documentation CD-ROM
- Power cord (plug matches destination requirements)

EPM Series Power Meters

The EPM Series power meters provide average power measurements.

The standard N1913A and N1914A power meters include:
- Single-channel power meter, order N1913A or dual-channel power meter, order N1914A
- Input sensor connector(s) on the front panel
- Reference calibrator connector on the front panel
- Power sensor cable, 1.5 m (5 ft) (One per N1913A, two per N1914A)
- USB cable Type A to Mini-B, 6 ft
- Documentation CD-ROM
- Keysight Instrument Control DVD
- IO Libraries Suite
- Command Expert
- BenchVue Software Platform
- 30-day free trial of BenchVue Power Meter/Sensor Control and Analysis app
- Standard Calibration of Certificate
- Power cord (plug matches destination requirements)
E-Series Power Sensors

The standard E4412A and E4413A CW power sensors include:
- Power sensor 10 MHz to 18 GHz, order E4412A, or power sensor 50 MHz to 26.5 GHz, order E4413A
- English-language Operating and Service Guide

The standard E9300 average power sensors include:

+20 to -60 dBm:
- Power sensor 10 MHz to 18 GHz, order E9300A
- Power sensor 10 MHz to 6 GHz, order E9301A
- Power sensor 9 kHz to 6 GHz, order E9304A

+30 to -50 dBm:
- Power sensor 10 MHz to 18 GHz, order E9300H
- Power sensor 10 MHz to 6 GHz, order E9301H

+44 to -30 dBm:
- Power sensor 10 MHz to 18 GHz, order E9300B
- Power sensor 10 MHz to 6 GHz, order E9301B
- English-language Operating and Service Guide (part number E9300-90009)

The standard E9320 peak and average power sensors include:
- Power sensor, 50 MHz to 6 GHz, 300 kHz bandwidth, order E9321A
- Power sensor, 50 MHz to 6 GHz, 1.5 MHz bandwidth, order E9322A
- Power sensor, 50 MHz to 6 GHz, 5 MHz bandwidth, order E9323A
- Power sensor, 50 MHz to 18 GHz, 300 kHz bandwidth, order E9325A
- Power sensor, 50 MHz to 18 GHz, 1.5 MHz bandwidth, order E9326A
- Power sensor, 50 MHz to 18 GHz, 5 MHz bandwidth, order E9327A
- English-language Operating and Service Guide

Please refer to the N1913A/14A data sheet for more average power sensor selections.
Compatibility

Power sensor compatibility

For compatibility of power meters, power sensors, and power sensor cables, please refer to the table below.

<table>
<thead>
<tr>
<th>Power sensors</th>
<th>Power meters</th>
<th>Power sensor cables</th>
</tr>
</thead>
<tbody>
<tr>
<td>E441x family</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>E9300 family</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>E9320 family</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>8480 Series</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N8480 Series</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>U8480, U2000 and U2040 Series (except U2049X and in Average Mode only)</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Firmware compatibility

Firmware upgrade information can be accessed from the World Wide Web, free of charge.

Calibration Options

- E441xA/B-A6J - Supplies ANSI Z540 certificate of calibration with data.
- E441xA/B-1A7 - Supplies ISO 17025 certificate of calibration with data.
- N1913/4A-A6J - Supplies ANSI Z540 certificate of calibration with data.
- N1913/4A-1A7 - Supplies ISO 17025 certificate of calibration with data.
- E93xxA/B/H-A6J - Supplies ANSI Z540 certificate of calibration with data.
Hardware Options

The following options are available on the EPM and EPM-P Series power meters. All order combinations have to be configured upon ordering; these options are not available for field upgrade.

EPM Series power meter

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1913/4A-004</td>
<td>Delete power sensor cable(s)</td>
</tr>
<tr>
<td>N1913/4A-101</td>
<td>Single/dual-channel average power meter</td>
</tr>
<tr>
<td>N1913/4A-201</td>
<td>Single/dual-channel average power meter with VGA, trigger in/out, one front and one rear USB ports</td>
</tr>
<tr>
<td>N1913/4A-B01</td>
<td>Without battery (Mandatory for option 201)</td>
</tr>
<tr>
<td>N1913/4A-C01</td>
<td>Front calibrator, front sensor (Need to order option 201)</td>
</tr>
<tr>
<td>N1913/4A-C02</td>
<td>Front calibrator, parallel front and rear sensor (Need to order option 201)</td>
</tr>
<tr>
<td>N1913/4A-C03</td>
<td>Rear calibrator, parallel front and rear sensor (Need to order option 201)</td>
</tr>
<tr>
<td>N1913A-200</td>
<td>436A and 437B code compatibility via GPIB interface only. 436A and 437B language modes are not compatible with LAN or USBTM remote interface. For new N1913A purchase.</td>
</tr>
<tr>
<td>N1914A-200</td>
<td>438A code compatibility via GPIB interface only. 438A language mode is not compatible with LAN or USBTM remote interface. For new N1914A purchase.</td>
</tr>
<tr>
<td>N1913/4A-908</td>
<td>Rack mount kit (one instrument). Can be ordered as standalone.</td>
</tr>
<tr>
<td>N1913/4A-909</td>
<td>Rack mount kit (two instruments). Can be ordered as standalone.</td>
</tr>
<tr>
<td>BV0007B</td>
<td>BenchVue Power Meter/Sensor Control and Analysis app license</td>
</tr>
<tr>
<td>N6901A-1FP</td>
<td>436A and 437B code compatibility for N1913A. Post purchase upgrade only.</td>
</tr>
<tr>
<td>N6902A-1FP</td>
<td>438A code compatibility for N1914A. Post purchase upgrade only.</td>
</tr>
</tbody>
</table>

1. Option 101 provides the front calibrator and the front sensor(s), and it can't be ordered with any of the options B0x/C0x.

EPM-P Series power meter

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E441xA/B-002</td>
<td>Parallel rear panel sensor input connector(s) and front panel reference calibrator connector</td>
</tr>
<tr>
<td>E441xA/B-003</td>
<td>Parallel rear panel sensor input connector(s) and rear panel reference calibrator connector</td>
</tr>
<tr>
<td>E441xA/B-004</td>
<td>Delete power sensor cable(s)</td>
</tr>
<tr>
<td>E441xA/B-908</td>
<td>Rack mount kit (one instrument). Can be ordered as stand-alone.</td>
</tr>
<tr>
<td>E441xA/B-909</td>
<td>Rack mount kit (two instruments). Can be ordered as stand-alone.</td>
</tr>
</tbody>
</table>
Service and Support Options

Calibration

The following calibration options are available:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-50C-011-3</td>
<td>Calibration Assurance Plan - Return to Keysight - 3 years</td>
</tr>
<tr>
<td>R-50C-011-5</td>
<td>Calibration Assurance Plan - Return to Keysight - 5 years</td>
</tr>
<tr>
<td>R-50C-016-3</td>
<td>ISO 17025 compliant calibration plan, 3 years</td>
</tr>
<tr>
<td>R-50C-016-5</td>
<td>ISO 17025 compliant calibration plan, 5 years</td>
</tr>
<tr>
<td>R-50C-021-3</td>
<td>ANSI Z540-1-1994 calibration plan, 3 years</td>
</tr>
<tr>
<td>R-50C-021-5</td>
<td>ANSI Z540-1-1994 calibration plan, 5 years</td>
</tr>
</tbody>
</table>

1. Options are not available in all countries.

Special Options

Special options for EPM-P Series power meters, EPM Series power meters, and E-Series sensors are available. The special options provide customized measurement capabilities to fit a wider range of applications. Contact your local Keysight representative for more information.

Documentation

- In support of the environmentally-friendly initiative, all printed documents are purchasable option. The following table shows the option numbers to order the documentation.

<table>
<thead>
<tr>
<th>Documentation</th>
<th>EPM-P series power meter</th>
<th>EPM series power meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>User’s Guide and Installation Guide (English)</td>
<td>E441xA-0B1</td>
<td>N1913/4A-OB1</td>
</tr>
<tr>
<td>Programming Guide</td>
<td>E441xA-0BF</td>
<td>N1913/4A-OBF</td>
</tr>
<tr>
<td>Service Guide</td>
<td>E441xA-0B3</td>
<td>Not available</td>
</tr>
<tr>
<td>Delete manual set</td>
<td>E441xA-0B0</td>
<td>N1913/4A-OB0</td>
</tr>
<tr>
<td>Add manual set, User’s Guide and Programming Guide (English)</td>
<td>E441xA-0BK</td>
<td>N1913/4A-OBK</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Documentation</th>
<th>E4412/3A</th>
<th>E9300</th>
<th>E9320A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add manual set</td>
<td>E4412/3A-0B1</td>
<td>E930xx-0B1</td>
<td>E932xA-0B1</td>
</tr>
</tbody>
</table>
Available Accessories

E9288A–C power sensor cables (refer to the compatibility section):
- 1.5 meters (5 ft) E9288A
- 3 meters (10 ft) E9288B
- 10 meters (31 ft) E9288C

11730A–F power sensor cables (refer to the compatibility section):
- 1.5 meters (5 ft) 11730A
- 3 meters (10 ft) 11730B
- 6.1 meters (20 ft) 11730C
- 15.2 meters (50 ft) 11730D
- 30.5 meters (100 ft) 11730E
- 61 meters (200 ft) 11730F

Accessory pouch, 34161A
- Holds accessories supplied or ordered

Basic instrument transit case, 34131A
- Protects the power meter during transit

Soft carry/operating case, 34141A
- Power meter with battery option can be operated in soft carry case

Spare battery, N1913/4A-300
- Extra battery for EPM Series power meters with Option 102

Auxiliary Equipment

The 11683A range calibrator verifies the accuracy and linearity of the EPM-P and EPM Series power meters. Outputs corresponding to the meter readings of 3, 10, 30, 100, and 300 μW and 1, 3, 10, 30, and 100 mW are provided. Calibration uncertainty is ±0.25% on all ranges.

Literature References

<table>
<thead>
<tr>
<th>Publication title</th>
<th>Publication number</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPM-P Series Single and Dual-Channel Power Meters E9320 Family of Peak and Avera - Technical Overview</td>
<td>5980-1471E</td>
</tr>
<tr>
<td>E4416A/E4417A EPM-P Series Power Meters and E-Series E9320 Peak and Average Power Sensors - Data Sheet</td>
<td>5980-1469E</td>
</tr>
<tr>
<td>Agilent EPM-P Series Single and Dual Channel Power Meters - Data Sheet</td>
<td>5988-1605EN</td>
</tr>
<tr>
<td>Choosing the Right Power Meter and Sensor - Application Note</td>
<td>5968-7150E</td>
</tr>
<tr>
<td>EPM Series Power Meters E-Series and 8480 Series Power Sensors - Data Sheet</td>
<td>5965-6382E</td>
</tr>
<tr>
<td>Agilent EPM Series Power Meters - Brochure</td>
<td>5965-6380E</td>
</tr>
<tr>
<td>Fundamentals of RF and Microwave Power Measurements - Application Note</td>
<td>5965-6630E</td>
</tr>
<tr>
<td>4 Steps for Making Better Power Measurements - Application Note</td>
<td>5965-8167E</td>
</tr>
<tr>
<td>Wide dynamic range. Multiple modulation formats. One sensor. - Technical Overview</td>
<td>5968-4960E</td>
</tr>
<tr>
<td>Seven Reasons to Migrate from an E4418/4419B to a Keysight N1913/1914A EPM Series Power Meter - Migration Guide</td>
<td>5990-4016EN</td>
</tr>
</tbody>
</table>
www.axiestandard.org
AdvancedTCA® Extensions for Instrumentation and Test (AXIe) is an open standard that extends the AdvancedTCA for general purpose and semiconductor test. The business that became Keysight was a founding member of the AXIe consortium. ATCA®, AdvancedTCA®, and the ATCA logo are registered US trademarks of the PCI Industrial Computer Manufacturers Group.

www.lxistandard.org
LAN eXtensions for Instruments puts the power of Ethernet and the Web inside your test systems. The business that became Keysight was a founding member of the LXI consortium.

www.pxisa.org
PCI eXtensions for Instrumentation (PXI) modular instrumentation delivers a rugged, PC-based high-performance measurement and automation system.

Download your next insight
Keysight software is downloadable expertise. From first simulation through first customer shipment, we deliver the tools your team needs to accelerate from data to information to actionable insight.

- Electronic design automation (EDA) software
- Application software
- Programming environments
- Productivity software

Learn more at www.keysight.com/find/software
Start with a 30-day free trial. www.keysight.com/find/free_trials
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.

http://www.keysight.com/find/emt_product_registration
Register your products to get up-to-date product information and find warranty information.

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/powermeters

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
www.keysight.com/go/quality
Keysight Technologies, Inc.
DEKRA Certified ISO 9001:2015
Quality Management System

This information is subject to change without notice.
© Keysight Technologies, 2010 – 2018
Published in USA, April 17, 2018
5990-4173EN
www.keysight.com