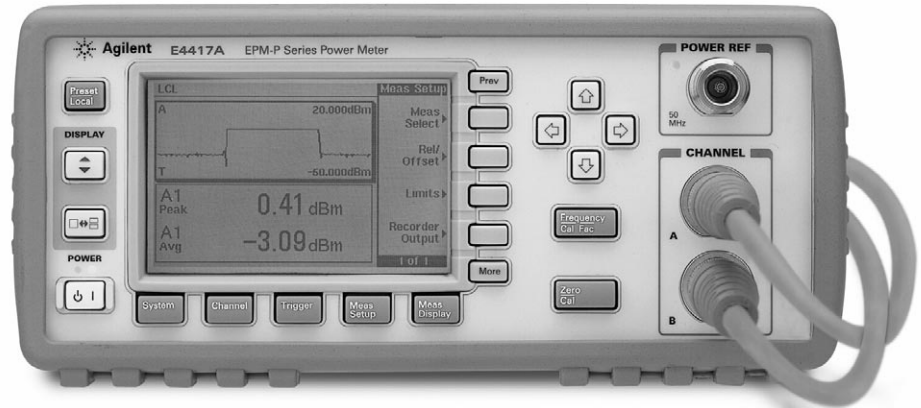


Agilent EPM and EPM-P Series Power Meters E-series Power Sensors

Configuration Guide



EPM Series Power Meters:

- E4418B Power Meter (single channel)
- E4419B 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)

Introduction

This configuration guide describes standard configurations, options and compatible accessories. For full specifications, see *EPM Series Power Meters and E-Series Power Sensors Technical Specifications* (Agilent literature number 5965-6382E), or *EPM-P Series Power Meters and E9320 Power Sensors Technical Specifications* (Agilent literature number 5980-1469E). Contact your local Agilent Technologies representative at the offices listed on the back of this guide if you need more information.

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 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 EPM-P series power meters include:

- Single-channel power meter, **order E4416A**
or dual-channel power meter, **order E4417A**
- Input sensor connector(s) on front panel
- Reference calibrator connector on front panel
- Hardcopy English-language *Installations Guide*
- *CD-Rom*, the English-language and localized *User's Guide*, the English-language *Programming Guide* and the Agilent *EPM-P analyzer software*
- Supplied accessories:
Power sensor cable (1.5 meter (5 ft) **E9288A**)
One per E4416A and two per E4417A
Power cord (plug matches destination requirements)

EPM series power meters

The EPM series power meters provide average power measurements.

The standard E4418B and E4419B power meters include:

- Single-channel power meter, **order E4418B**
or Dual-channel power meter, **order E4419B**
- Input sensor connector(s) on front panel
- Reference calibrator connector on front panel
- English-language *User's Guide* and *Programming Guide*
- Supplied Accessories:
Power sensor cable (1.5 meter (5 ft) **11730A**).
One per E4418B and two per E4419B
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**
Power sensor 50 MHz to 26.5 GHz, **order E4413A**
- English-language *Operating and Service Manual*

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 Manual*
(also available as Agilent 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 Manual*

Compatibility

Power sensor compatibility

For compatibility of Power Meters, Power Sensors and Power Sensor Cables please refer to the table below.

| Power sensors | Power meters | | Power sensor cables | |
|---------------|---------------------------|-------------------------|----------------------------|----------------------------|
| | EPM-P series power meters | EPM series power meters | 11730 sensor cables (grey) | E9288 sensor cables (blue) |
| E441X family | Yes | Yes | Yes | Yes |
| E9300 family | Yes | Yes ¹ | Yes | Yes |
| E9320 family | Yes | No | No | Yes |
| 8480 series | Yes | Yes | Yes | Yes |

Firmware compatibility

The table below shows the required revision of firmware for operation of the E9300 power sensors as well as the part number of the required hardware upgrade kit.

| | E4418A/E4419A | | E4418B/E4419B |
|----------------|-----------------------|-------------|-----------------------|
| | Firmware | Hardware | Firmware |
| E9300A/01A/04A | Rev A1.04.00/A2.04.00 | E4418-60021 | Rev A1.04.00/A2.04.00 |
| E9300H/01H | Rev A1.06.00/A2.06.00 | E4418-60021 | Rev A1.06.00/A2.06.00 |
| E9300B/01B | Rev A1.06.00/A2.06.00 | E4418-60021 | Rev A1.06.00/A2.06.00 |

Firmware upgrade information can be accessed from the World Wide Web, free of charge. It can also be purchased as a firmware upgrade kit, Agilent part number E4418-61035. The hardware upgrade is a simple upgrade and the kit provides the parts required. The upgrade can be performed at any local Service Center or at a customer site.

1. Please refer to the firmware compatibility table to ensure compatibility for this combination.

Hardware options

The following options are available on the EPM and EPM-P power meters.

| Option | Description | EPM-P series power meters | EPM series power meters |
|------------------|--|------------------------------|----------------------------|
| 001 | Internal rechargeable battery | No | Yes |
| 002 | Rear panel sensor input(s) (Power ref on front panel) | Yes | Yes |
| 003 | Rear panel sensor input(s) (Power ref on rear panel) | Yes | Yes |
| 004 | Delete the power sensor cable | Yes | Yes |
| 908 ¹ | One instrument rackmount kit | Yes | Yes |
| 909 ² | Two instrument rackmount kit | Yes | Yes |

Service and support options

| Option | Description | EPM-P series power meters | EPM series power meters |
|--------|---|------------------------------|----------------------------|
| W30 | 3 years customer return repair service | n/a ³ | n/a ³ |
| W32 | 3 years customer return calibration service | Yes | Yes |
| W34 | 3 years customer return standards compliance calibration service | Yes | Yes |
| W50 | 5 years customer return repair service | Yes | Yes |
| W52 | 5 years customer return calibration service | Yes | Yes |
| W54 | 5 years customer return standards compliance calibration service | Yes | Yes |

Special options

Special options for EPM-P series power meters, EPM series power meters, and E-series sensors are available. Contact your local Agilent representative for more information.

1. Also available as Agilent part number 5063-9240.
2. Also available as Agilent part numbers 5063-9212 and 5061-9694.
3. The EPM and EPM-P series power meters are supplied with a 3-year customer return repair service as standard.

Documentation

- The EPM power meters supply the standard documentation in hard copy.
- The EPM-P power meters provide a hardcopy *Installation Guide* which includes all languages and a CD-ROM which contains the Agilent EPM-P analyzer software, *User's Guide and Programming Guide*. The localized versions of the *Users Guide* are included on the CD.

| Power meters | EPM-P series power meters | EPM series power meters |
|---------------------------------------|------------------------------------|--|
| <i>User's Guide</i> | Opt 0BK (hard copy) E4416-90004 | Opt 916 (additional) E4418-90032 (E4418B) E4419-90006 (E4419B) |
| <i>Programming Guide</i> | Opt 0BK (hard copy) E4416-90005 | Opt 916 (additional) E4418-90029 |
| <i>Service Manual</i> | Opt 0B3 E4416-90014 | Opt 915 E4418-90030 |
| Component level Service documentation | | Opt 0BV E4418-90031 |
| Delete manual set | | Opt 0B0 |
| Add manual set | Opt 0BK | Opt 916 |

| Power sensors | E4412A/13A | E9300 | E9320 |
|---------------------|-------------|-------------|-------------|
| <i>User's Guide</i> | E4412-90001 | E9300-90016 | E9321-90001 |
| Add manual set | Opt 0B1 | Opt 0B1 | Opt 0B1 |

Localization options

The following table supplies the option number as well as the Agilent part number to order the documentation.

The following options provide a hardcopy of the localized *User's Guide*. For the EPM-P the localized manuals are all available on the CD-ROM supplied with the product. The localized options for the EPM-P provide a hardcopy of the localized *User's Guide* and an English hardcopy of the *Programming Guide*.

| Option | Agilent part numbers | | | | |
|---------------|----------------------|--------------------|---------------------------|------------------|---------------|
| | E4418B power meter | E4419B power meter | EPM-P series power meters | E4412/3A sensors | E9300 sensors |
| ABD - German | E4418-90033 | E4419-90007 | E4416-90006 | E4412-90003 | E9300-90011 |
| ABE - Spanish | E4418-90036 | E4419-90010 | E4416-90007 | E4412-90005 | E9300-90013 |
| ABF - French | E4418-90034 | E4419-90008 | E4416-90008 | E4412-90002 | E9300-90010 |
| ABJ - Japan | E4418-90037 | E4419-90013 | E4416-90009 | E4412-90006 | E9300-90014 |
| ABZ - Italian | E4418-90035 | E4419-90009 | E4416-90010 | E4412-90004 | E9300-90012 |
| AB1 - Korean | | | | | E9300-90015 |

Calibration options

Supplies ANSI Z540 certificate of calibration with data, **Option A6J**
Note: Option A6J supercedes Options 1BN, 1BP and UK6.

Accessories available

- **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 case
- **Spare battery, E9287A**
 - Extra battery for EPM series power meters with **Option 001**

Auxiliary equipment

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

Literature reference

EPM-P Series Power Meters and E9320 Sensors, Product Overview,
5980-1471E

EPM-P Series Power Meters and E9320 Sensors, Technical Specifications,
5980-1469E

EPM-P Series Single and Dual Channel Power Meters, Demo Guide,
5988-1605EN

EPM-P Series Power Meters, CD-ROM,
E4416-90022

Choosing the Right Power Meter and Sensor, Product Note,
5968-7150E

EPM Series Power Meter and E-Series Power Sensors, Technical Specifications,
5965-6382E

EPM Series Power Meter and E-Series Power Sensors, Brochure,
5965-6380E

Fundamentals of RF and Microwave Power Measurements,
Application Note 64-1,
5965-6630E

4 Steps for better Power Measurements, Application Note 64-4,
5965-8167E

E-Series E9300 Power Sensors, Product Overview,
5968-4960E

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