

Keysight N1913/1914A EPM Series Power Meters

Installation
Guide



Notices

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Safety Information

CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Certification

Keysight Technologies certifies that this product met its published specifications at the time of shipment. Keysight further certifies that its calibration measurements are traceable to the United States National Institute of Standard and Technology (formerly National Bureau of Standards), to the extent allowed by that organization's calibration facility, and to the calibration facilities of other International Standards Organization members.

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Warranty Service

For warranty service or repair, this product must be returned to a service facility designated by Keysight. For products returned to Keysight for warranty service, the Buyer shall prepay shipping charges to Keysight and Keysight shall pay shipping charges to return the product to the Buyer. However, the Buyer shall pay all shipping charges, duties, and taxes for products returned to Keysight from another country.

Limitation of Warranty

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by the Buyer, Buyer-supplied products or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation or maintenance.

The design and implementation of any circuit on this product is the sole responsibility of the Buyer. Keysight does not warrant the Buyer's circuitry or malfunctions of Keysight products that result from the Buyer's circuitry. In addition, Keysight does not warrant any damage that occurs as a result of the Buyer's circuit or any defects that result from Buyer-supplied products.



















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To the extent allowed by local law, the remedies provided herein are the Buyer's sole and exclusive remedies. Keysight shall not be liable for any direct, indirect, special, incidental, or consequential damages (including lost profit or data), whether based on warranty, contract, tort, or any other legal theory.

Safety Symbols

The following symbols on the instrument and in the documentation indicate precautions which must be taken to maintain safe operation of the instrument.

	Direct current (DC).		Alternating current (AC).
	Off (mains supply).		On (mains supply).
	Caution, risk of electric shock.		Caution, risk of danger (refer to this manual for specific Warning or Caution information).
	Earth (ground) terminal.		Frame or chassis (ground) terminal.
	Protective earth (ground) terminal.		Equipment protected throughout by double insulation or reinforced insulation.
	Both direct and alternating current.		Out position of a bi-stable push control.
	Caution, hot surface.		In position of a bi-stable push control.
	Three-phase alternating current.		Equipotentiality.
	This symbol indicates the operating switch for 'Stand-by' mode. Note, this instrument is NOT isolated from the mains when the switch is pressed. To isolate the instrument, the mains coupler (mains input cord) should be removed from the power supply.		This symbol indicates that a device, or part of a device, may be susceptible to electrostatic discharges (ESD) which can result in damage to the product. Observe ESD precautions given on the product, or its user documentation, when handling equipment bearing this mark.

Safety Considerations

Read the information below before using this instrument.

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards for design, manufacture, and intended use of the instrument. Keysight Technologies assumes no liability for the customer's failure to comply with these requirements.

General Safety Information

This is a Safety Class I instrument (provided with a protective earthing ground, incorporated in the power cord). The mains plug shall only be inserted in a socket outlet provided with a protective earth contact. Any interruption of the protective conductor inside or outside of the instrument is likely to make the instrument dangerous. Intentional interruption is prohibited.

WARNING

- Do not operate the product in an explosive atmosphere or in the presence of flammable gases or fumes.
 - Do not use repaired fuses or short-circuited fuseholders: For continued protection against fire, replace the line fuse(s) only with fuse(s) of the same voltage and current rating and type.
 - Do not perform procedures involving cover or shield removal unless you are qualified to do so: Operating personnel must not remove equipment covers or shields. Procedures involving the removal of covers and shields are for use by service-trained personnel only.
 - Do not service or adjust alone: Under certain conditions, dangerous voltages may exist even with the equipment switched off. To avoid electrical shock, service personnel must not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.
 - Do not operate damaged equipment: Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until safe operation can be verified by service-trained personnel. If necessary, return the product to Keysight Technologies Sales and Service Office for service and repair to ensure the safety features are maintained.
 - Do not substitute parts or modify equipment: Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the product. Return the product to a Keysight Technologies Sales and Service Office for service and repair to ensure the safety features are maintained.
-

Regulatory Information

EMC compliance

This product complies with the essential requirements of the following applicable European (EC) Directives, and carries the CE marking accordingly to Low Voltage Directive (2006/95/EC) and EMC Directive (2004/108/EC).

EMC test have conforms to the IEC61326- 1:2005 / EN61326- 1:2006 and CISPR11:2003 / EN55011:2007 (Group 1, Class A). In order to preserve the EMC performance of the product, any cable which becomes worn or damaged must be replaced with the same type and specification.

The product also meets the following EMC standards:







- Canada: ICES/NMB- 001:2004
- Australia/New Zealand: AS/NZS CISPR 11:2004

Safety compliance

This product conforms to the requirements of the following safety standards:

- IEC 61010- 1:2001 / EN 61010- 1:2001
- Canada: CAN/CSA- C22.2 No.61010- 1- 04
- USA: ANSI/UL61010- 1:2004

Regulatory Markings

 <p>The CE mark is a registered trademark of the European Community. This CE mark shows that the product complies with all the relevant European Legal Directives.</p> <p>ICES/NMB-001 indicates that this ISM device complies with the Canadian ICES-001.</p> <p>Cet appareil ISM est conforme a la norme NMB-001 du Canada.</p> <p>ISM GRP.1 Class A indicates that this is an Industrial Scientific and Medical Group 1 Class A product.</p>	 <p>The CSA mark is a registered trademark of the Canadian Standards Association.</p>
 <p>This symbol is a South Korean Class A EMC Declaration. This is a Class A instrument suitable for professional use and in electromagnetic environment outside of the home.</p>	 <p>The RCM mark is a registered trademark of the Australian Communications and Media Authority.</p>
 <p>This symbol indicates the time period during which no hazardous or toxic substance elements are expected to leak or deteriorate during normal use. Forty years is the expected useful life of the product.</p>	 <p>This instrument complies with the WEEE Directive (2002/96/EC) marking requirement. This affixed product label indicates that you must not discard this electrical or electronic product in domestic household waste.</p>

Cooling Requirements

To provide adequate cooling, an air gap of approximately 75 mm (3 ins) should be maintained around the vented sections of the instrument.

Cleaning

Use a soft, clean, damp cloth to clean the front- panel and side covers.

Use

This instrument is designed for indoor use only.

WARNING

- Appliance coupler (mains input power cord) is the power disconnect device. Do not position the instrument such that access to the coupler is impaired.
 - For continue protection against fire hazard, replace the line fuse only with the same type and line rating (250 V, T2.5 H, 20 mm slow blow fuse with high breaking capacity). The use of other fuses or materials is prohibited.
 - No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock do not remove covers
 - If this instrument is not used as specified, the protection provided by the equipment could be impaired. This instrument must be used in a normal condition only (in which all means for protection are intact).
-

Sound Emission

Herstellerbescheinigung

Diese Information steht im Zusammenhang mit den Anforderungen der Maschinenlarminformationsverordnung vom 18 Januar 1991.

Sound Pressure LpA < 70 dB.

Am Arbeitsplatz.

Normaler Betrieb.

Nach DIN 45635 T. 19 (Typprüfung).

Manufacturers Declaration

This statement is provided to comply with the requirements of the German Sound DIN 45635 T. 19 (Typprüfung).

Sound Pressure LpA < 70 dB.

At operator position.

Normal operation.

According to ISO 7779 (Type Test).

Responsibilities of the Customer

The customer shall provide:

- Access to the products during the specified periods of coverage to perform maintenance
- Adequate working space around the products for servicing by Keysight personnel.
- Access to and use of all information and facilities determined necessary by Keysight to service and/or maintain the products. (Insofar as these items may contain proprietary or classified information, the customer shall assume full responsibility for safeguarding and protection from wrongful use.)
- Routine operator maintenance and cleaning as specified in the Keysight Operating and Service Manuals.
- Consumables such as replacement fuses, etc.

Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC

This instrument complies with the WEEE Directive (2002/96/EC) marking requirement. This affixed product label indicates that you must not discard this electrical or electronic product in domestic household waste.

Product category:

With reference to the equipment types in the WEEE directive Annex 1, this instrument is classified as a “Monitoring and Control Instrument” product.

The affixed product label is as shown below.



Do not dispose in domestic household waste.

To return this unwanted instrument, contact your nearest Keysight Service Center, or visit <http://about.keysight.com/en/companyinfo/environment/takeback.shtml> for more information.

Sales and Technical Support

To contact Keysight for sales and technical support, refer to the support links on the following Keysight websites:

- www.keysight.com/find/epm
(product-specific information and support, software and documentation updates)
- www.keysight.com/find/assist
(worldwide contact information for repair and service)

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Introduction

The *Keysight N1913/1914A EPM Series Power Meter Installation Guide* shows you how to:

- physically check the power meter.
- adjust the carrying handle.
- switch it on and confirm the meter passes the power-on self test
- connect it to a U2000 Series power sensor.
- connect it to a 8480, N8480 Series or E-Series power sensor.
- perform a zero and calibration routine on a 8480, N8480 Series, or E-Series power sensor.
- perform a zero routine on U2000 Series power sensors.
- make connections to the rear panel.
- use the Keysight IO Libraries Suite to configure the remote programming interfaces.
- attach the rack mounting kits (supplied with Option 908 or Option 909).

NOTE

Both single and dual channel power meters with a variety of rear panel configurations have been used for the illustrations in this guide. Your power meter may differ in details to those shown.

Initial inspection

Please inspect the shipping container for damage. If the shipping container or packaging material is damaged, it should be kept until the contents have been checked mechanically and electrically. If there is mechanical damage, notify the nearest Keysight Technologies office. Keep the damaged shipping materials (if any) for inspection by the carrier and a Keysight representative. If required, you can find a list of Keysight Sales and Service Offices.

Please ensure you have read and understood the preceding safety information before you proceed.

Documentation Information

This guide is only part of the information supplied. The documentation consists of:

- The *Installation Guide* (this book) - Shows you how to check your power meter, switch it on and connect it to a Keysight power sensor. *This information is presented in English and Japanese.*
- The *User's Guide* - Shows you how to operate your power meter from the front panel interface to make measurements using the Keysight E-Series E9300, E-Series E4410, N8480 Series, 8480 Series, and U2000 Series power sensors. You can find the *User's Guide* as an Adobe Acrobat Portable Document Format (PDF) file on the supplied CD-ROM in English and Japanese.
- The *Programming Guide* - Shows you how to operate your power meter using the remote interfaces. You can find the *Programming Guide* as an Adobe Acrobat PDF file on the supplied CD-ROM. This guide is supplied in English language only.

Printed guides are available by ordering the following options:

- English language user's guide - ABA
- Japanese language user's guide - ABJ

NOTE

A printed *Programming Guide* is also supplied with Option ABJ but in English language only. For Option ABA, the printed *Programming Guide* is available only by ordering Option 0BF.

There is also a *Connectivity Guide* supplied as an Adobe Acrobat PDF file on the *Keysight IO Libraries Suite* CD-ROM. This is to help you configure your EPM Series power meter using the GPIB, LAN, or USB remote connections.

What You'll Find in This Guide






This guide is divided into the following sections:

- Adjusting the Carrying Handle
- Turning the Power Meter On
- Front Panel Keys and Connections
- Connecting a Power Sensor
- Rear Panel Connections
- Remote Interface Configurations
- Rack Mounting the Power Meter
- General Specifications
- Compliance and Markings
- Regulatory Information
- Responsibilities of the Customer

For more detailed operating information, refer to the *N1913/1914A EPM Series Power Meter User's Guide* and *Programming Guide*.

Conventions Used in this Guide

The following conventions are used to show the difference between a front panel key and a softkey.

	This symbol and text represents a labeled key on the power meter front panel.
	This symbol and text represents a labeled softkey and is used to indicate you should press the unmarked key beside the displayed text.
	This text represents a displayed message.
	This is used to represent a parameter, value, or title.
	<p>This user's guide describes the operation for both the single channel and the dual channel power meter. To identify channels on a dual channel meter a Channel softkey on an N1913A meter becomes Channel A and Channel B on an N1914A.</p> <p>When you are asked to press "the channel" Softkey in a procedure, ensure that you have selected the relevant channel.</p>

Power Meter and Sensor Capability

Your N1913/1914A EPM Series power meter is compatible with Keysight E9300 E-Series, E4410 E-Series, 8480 Series, N8480 Series, and U2000 Series power sensors. However, not all sensor and meter combinations have the same features or capabilities. The main differences are:

Features	E-Series E9300	E-Series E4410	8480 Series	N8480 Series	U2000 Series
Average power of CW signal	*	*	*	*	*
Average power of modulated signal	*		*	*	*
Cal factors stored on EEPROM	*	*		*[a]	*
Correction factors stored in a 3 MB Flash memory					*
≥200 readings/sec	*	*			

[a] Not applicable for N8480 Series power sensors with Option CFT

Specifications

The specifications for the power meter are listed in the *N1913/1914A EPM Series Power Meter User's Guide*.

Adjusting the Carrying Handle

Adjust the carrying handle to carry the meter or view the display.

The carrying handle can be locked into three different positions.



Pull the handle outwards, rotate it to the required position and release it into one of the three locks.



To remove the handle, refer to [“Rack Mounting the Power Meter”](#) on page 50.

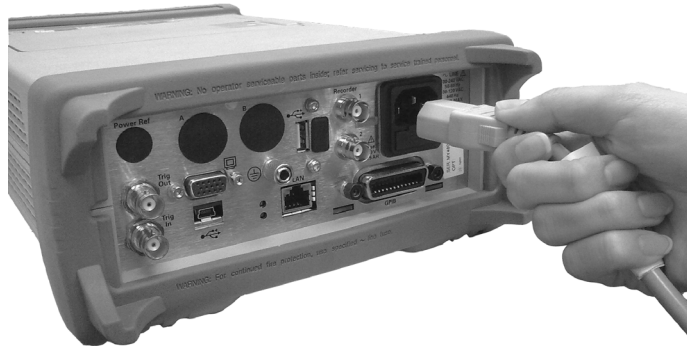
Turning the Power Meter On

You can turn the power meter on without connecting a power sensor or power-sensor cable.

NOTE

The instrument has an auto ranging power supply. Ensure the supplied voltage is within the range of 100 V_{ac} to 240 V_{ac} and 50 Hz to 60 Hz and 400 Hz.

- 1 Connect the power cord.



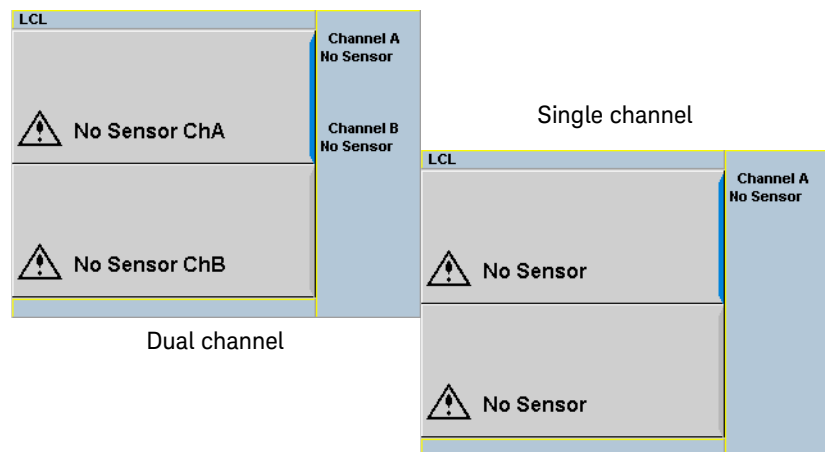
- 2 Check that the background LED is red.



- 3 Turn the meter on and confirm the background LED is green.



- 4 The power meter start-up will take approximately 25 seconds. After this routine, you should see one of the following displays...



- 5 The power meter is now ready for use.

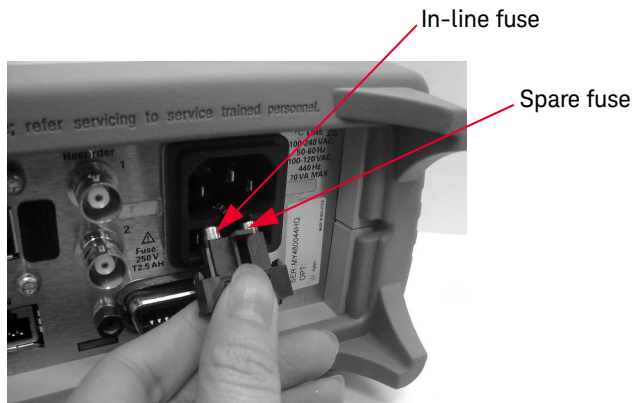
NOTE

If the meter has been stored in extremely cold conditions, beyond its normal operating range, the display may require a few minutes to warm up and operate normally.

What Can Go Wrong?

See this	Do this
Red LED not lit	Check that power is supplied to the meter. Check the power meter fuse. (see step 6)
Fails self test(s)	If there are any self-test failures the meter is defective. Contact your nearest Keysight Service Center (Refer to “Sales and Technical Support” on page 13).

6 Line input fuse and spare fuse.



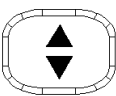
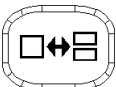



Front Panel Keys and Connections

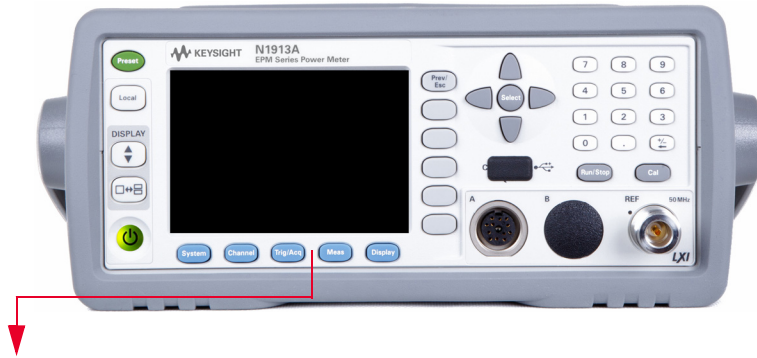
This section briefly describes the functions of the front panel keys and connectors. The user's guide shows you how to use them in more detail.









These keys are located to the left of the display.

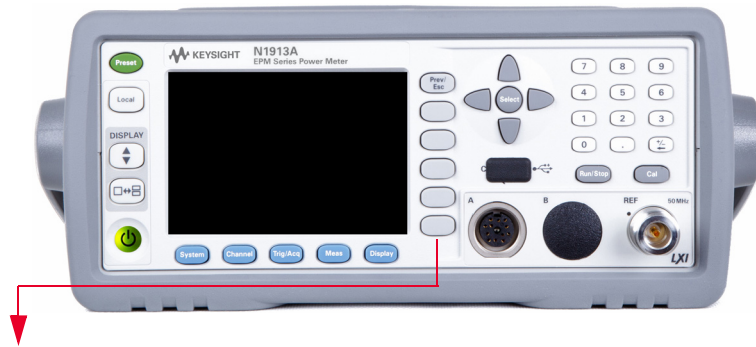
Key	Function
	Press this key to preset the power-meter to the default setting.
	Press this key to control the power meter from the front panel when it is operating via the remote interfaces (when Local Lock Out is not enabled).
	Press this key to select the upper or lower measurement window. The selected window is highlighted by a blue line on the right side of the window. Any measurement setup you create is performed in the selected window.
	Press this key to choose windowed, expanded, or full-screen display of a numeric measurement. It also provides quick access to the Gate Control screen and menu when a trace window is selected.
	Press this key to switch the meter between on and standby. When power is supplied, the background LED is red. Pressing the key, switches the power meter on and the background LED is green. When the meter is powered on, the start-up will take approximately 25 seconds.

1 Getting Started


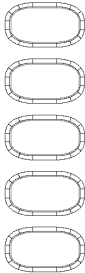



These keys are located along the lower edge of the display.

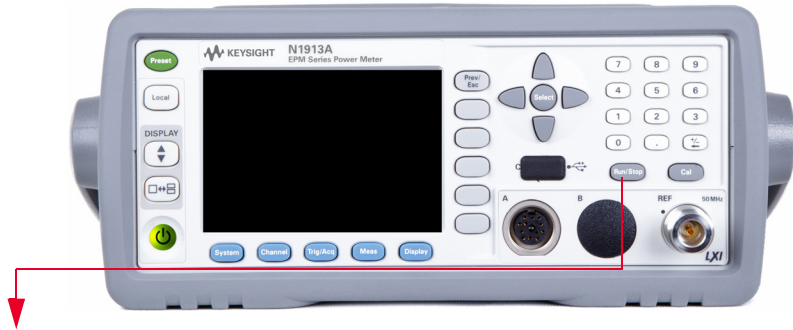
Key	Function
 System	Press this key to access general configuration-menus, such as GPIB address. You can also access some measurement configuration-menus. The measurement screen remains visible.
 Channel	Press this key to access the channel configuration menus. Channel parameters such as averaging and offsets are configured from this menu.
 Trig/Acq	Press this key to access the triggering menu. The triggering feature will be made available in future for power sensors with triggering capability.
 Meas	Press this key to setup relative measurements or set display offsets. Use this key to configure the selected measurement.
 Display	Press this key to access the measurement display menu. You can choose the displayed measurement resolution, units and display format. Use this key together with  Meas to configure measurement displays.



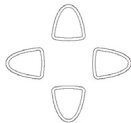



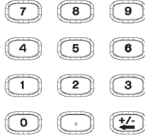
These keys are all associated with the menu labels and data entry. They are located to the right of the display.


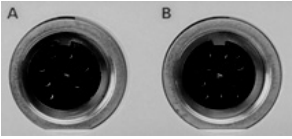

Key	Function
	Press this key to return to the previous screen. This key also cancels pop-up entry.
	These unmarked keys are called 'softkeys' and are referred to the text on the display next to them. For example, during a Preset, you are given an option to confirm the command. Press Confirm to continue, that is, press the softkey beside the displayed word 'confirm'.
	The lowest of the unmarked softkeys is used when there is a two page menu to be displayed. For example, a 1 of 2 is displayed beside the key indicating the first page of a two page menu. Press the key to access the next page or second page. (A 2 of 2 is displayed).

1 Getting Started



These keys and connectors are associated with the measurement channels and are located on the right-hand side of the front panel.

Key	Function
	The arrow keys are used to highlight measurement setups and change parameters such as instrument state names. The user's guide shows how these keys are used in more detail.
	Press this key to check the highlighted parameter On/ Off or select the highlighted field. Refer to the user's guide for more information.
	Press this key to access the zero and calibration menus. Refer to the user's guide for more information.
	Press this key to reset the MAX HOLD and MIN HOLD measurement. Refer to the user's guide for more information.
	Press these keys to enter numeric values in the pop-up fields, for example, the offset values. To complete the entry use the softkey. Refer to the user's guide for more information.

Connector	Function
	<p>The power reference is a 1 mW (0 dBm) 50 MHz signal available from a 50 Ω type-N connector. It is used for calibrating an 8480 or E-Series Power Sensor and Meter system. If the meter is configured with Option 003, the connector is fitted to the rear panel. The green LED beside the connector is lit when the calibrator is turned on.</p>
	<p>The sensor input connectors (N1914A shown, the N1913A has one input). If the meter is configured with Option 003, the connectors are fitted to the rear panel and the front panel connectors are retained.</p>
	<p>The USB Type A port is solely for U2000 Series power sensors usage only. If the meter is configured with Option 008, one USB Type A port is fitted to the front panel and another Type A port to the rear panel. If the meter is configured with Option 009, two USB Type A ports are fitted to the rear panel.</p>

Connecting a Power Sensor

E-Series, 8480, N8480 Series, and U2000 Series power sensor models

Using the Keysight 11730A power sensor cable, any Keysight 8480, or N8480 Series, E-Series power sensor can be connected to the N1913A or N1914A power meters. The U2000 Series power sensors can be connected to the meter using the Keysight U2031A power sensor cable.

The following shows the procedure for single channel meters configured with front panel mounted POWER REF and CHANNEL connectors. The procedure is similar for meters configured with rear panel connectors. Also, for dual channel meters (N1914A), you should repeat the procedure for the channel B sensor.

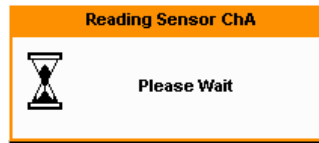
- 1 Connect the sensor to a 11730A cable.



- 2 Connect the other end of the 11730A cable to the CHANNEL A (or CHANNEL B) input connector.



- 3 Confirm a reading sensor pop-up message appears briefly.



This message does not appear when connecting an 8480 Series power sensor.

- 4 Confirm the display has changed to a measurement reading.

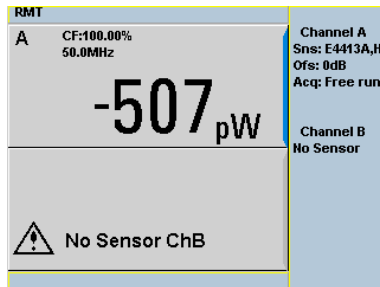



Diagram shows display with an E-Series E4413A power sensor connected.

Dual channel

- 5 Connect the sensor to the POWER REF connector.



1 Getting Started

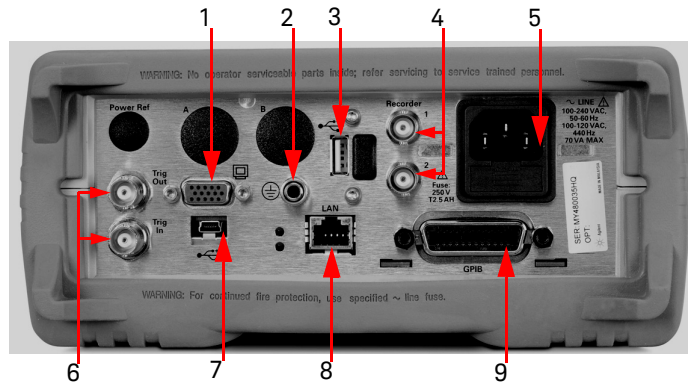
- 6 When the sensor is connected to the POWER REF, you can zero and calibrate the measurement path quickly by pressing , **Zero + Cal** . On dual channel meters, press **Zero + Cal A** or **Zero + Cal B** .



The Zeroing pop-up is displayed during the zeroing process, the Calibrating pop-up during calibration. The meter-sensor measurement path is calibrated when the Calibrating pop-up disappears.

Rear Panel Connections

The following connections are available on the rear panel. To setup the remote interfaces, refer to “[Remote Interface Configurations](#)” on page 39.



No.	Connections
1	VGA Output (Option 010)
2	Ground Connector
3	USB Type A port (Option 008, Option 009) This USB port is solely for U2000 Series power sensors usage only.
4	Recorder 1/2 Recorder output (two outputs are fitted to dual channel meters) connections are made via BNC connectors. This output produces a DC voltage that corresponds to the power level of the channel input.
5	AC Inlet This power meter has an auto configuring power supply. This allows it to operate over a range of voltages without manually being set to a certain voltage.
6	Trig In/Trig Out Trigger input and output connections are made via BNC connectors.
7	USB Mini-B port This USB port is used for remote interface connection.

1 Getting Started

8	LAN
9	GPIB This connector allows the power meter to be controlled remotely using the General Purpose Interface Bus.

Remote Interface Configurations

The power meter can be remotely controlled by LAN, USB, and GPIB (IEEE488) programming interfaces. This section shows you how to set the interface configurations.

Only one interface should be used at any one time.

NOTE

To connect the power meter to your PC, configure and verify your connection, you can use the *Keysight IO Libraries Suite*, the E2094M Keysight IO Libraries for Windows, or an equivalent.

- Keysight IO Libraries Suite for Windows 98/2000/ME/XP. For information and to install, use the *Automation-Ready CD with Keysight IO Libraries Suite* which is shipped with the power meter.
- E2094M Keysight IO Libraries for Windows 98/NT/2000/ME/XP. You can find information and install this application via the Web at www.keysight.com/find/iolib.
- You can also access other information about Keysight IO Libraries at www.keysight.com/find/iolib.

For more information on configuring the remote interface connectivity, refer to the *Keysight Technologies USB/LAN/GPIB Interfaces Connectivity Guide*. If you have installed the IO Libraries Suite, you can access the connectivity guide via the Keysight IO Libraries Control icon. Alternatively, you can access the connectivity guide via the Web at www.keysight.com/find/connectivity.

USB

The USB interface requires no front panel configuration. USB operation and configuration is supported by the version of VISA and SICL IO libraries on your PC.

NOTE

Before connecting the USB cable, ensure that the I/O software is installed in your computer.

See “**Remote Interface Configurations**” on page 39 for information about Keysight IO Libraries software. If you have installed other I/O software, refer to documentation that accompanies the software.

- 1 After I/O software is installed on your computer, connect your EPM Series power meter to your PC using the supplied Type A - Mini 5 pin USB cable.
- 2 The PC confirms the hardware connection.
- 3 The Found New Hardware Wizard automatically starts and guides you through configuring the power meter as a USB device (see [Figure 1-1](#)). Click **Next** to install the software automatically, accept all defaults to complete the installation.



Figure 1-1 Found New Hardware Wizard

NOTE

If you installed Keysight IO Libraries software, you also installed low-level drivers. Therefore, you do not need to insert the CD when Found New Hardware Wizards requests you to do so.

- 4 When the Wizard has completed configuring the power meter, a Assign USB device alias window appears on your PC. If required, enter an **Alias** name to easily identify the power meter.
- 5 You can use Connection Expert in the IO Libraries Suite to check instrument identification.
- 6 Now you can use various programming environments to control the power meter. For an overview about programming the power meter via USB, refer to the connectivity guide and the programming guide.

LAN

The power meter has three LAN operating modes:

- Dynamic IP (Dynamic Host Configuration Protocol or DHCP)
- Auto IP (Local PC Control or isolated (non-site) LAN)
- Static IP (Manual mode)

NOTE

Your power meter uses standard VXI-11 protocol for emulating GPIB over a TCP/IP link. The emulated GPIB address is fixed at 15.

Configuring the Power Meter

- The IP address, subnet mask, and default gateway, can be changed manually or remotely.
- The IP address, subnet mask, and default gateway values are stored in non-volatile memory and are not part of the save-recall function.

Selecting the LAN Network Type

You can connect and configure your power meter for site LAN or isolated (non-site) LAN.

A site LAN network is defined as a local area network (LAN) in which computers and LAN-enabled instruments are connected to a site LAN (workgroup LAN, intranet, or enterprise LAN) via optional routers, hubs, and/or switches.

An isolated (non-site) LAN network is defined as a local area network (LAN) in which computers and LAN-enabled instruments are not connected to a site LAN.

Select the LAN network type you will use to connect the power meter to your computer. Then follow the procedure that corresponds to your selected LAN network type.

Dynamic Mode


In dynamic mode the IP address, subnet mask, and default gateway values are obtained from a DHCP server. When you use DHCP operation you cannot configure the IP address, subnet mask, and default gateway values from the front panel.

Using this dynamic mode does not require a detailed knowledge of your network configuration.

NOTE

If the DHCP server cannot be found on your network, the power meter returns to the AutoIP mode, then static mode.

- 1 Using a standard LAN patch cable, connect both the computer and the power meter to LAN outlets.
- 2 Turn the power on the power meter.

- 3 Press  , **Remote Interfaces** to display the Remote Interface display. Ensure that DHCP to ON (ON is the factory default state).

To enable DHCP operation using the arrow and Select keys to highlight and check DHCP is checked.

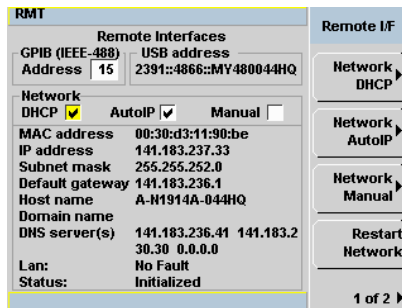


Figure 1-2 Typical LAN Remote Interface

NOTE

If your LAN does not support DHCP, refer to the connectivity guide.

4 Press **Network DHCP** if you need to set any optional settings.

5 Press **Restart Network**.

A pop-up appears for 5 seconds (see [Figure 1-3](#)). Monitor the Status at the bottom of the display to see when the server has assigned an address.

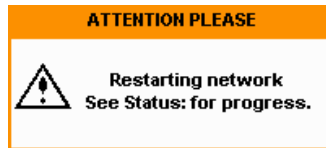


Figure 1-3 LAN Network Restart Pop-up

6 Press  , to return to a measurement screen.

7 If you intend to program over LAN or use such programs, make sure you have installed I/O software on your computer.

8 Use the Connection Expert utility of the IO Libraries Suite to add the power meter and verify a connection. When identifying the instrument, it is easiest to use the IP address that you noted in [step 6](#) above.



NOTE

If you have installed other I/O software, refer to documentation that accompanies the software.

9 You can use various programming environments to control the power meter. For an overview about programming instruments via LAN, refer to the connectivity guide.

Auto IP Mode

Use this procedure if you require local PC Control or you are working in an isolated (non-site) LAN.

- 1 Connect the computer to the power meter.
- 2 Switch the power meter on.
- 3 Press , **Remote Interfaces** to display the Remote Interface display (see [Figure 1-2](#)). Ensure that AutoIP is checked.
- 4 Press **Network AutoIP** if you need to set any optional settings.
- 5 Press **Restart Network**.
A pop-up appears for 5 seconds (see [Figure 1-3](#)). Monitor the Status at the bottom of the display to see when the server has assigned an address.
- 6 Press , to return to a measurement screen.
- 7 If you intend to program over LAN or use such programs, make sure you have installed I/O software on your PC.
- 8 Use the Connection Expert utility of the IO Libraries Suite to add the power meter and verify a connection.

NOTE

If you have installed other I/O software, refer to documentation that accompanies the software.

- 9 You can use various programming environments to control the power meter. For an overview about programming instruments via LAN, refer to the connectivity guide.


Static Mode (Configuring the LAN Manually)


In static mode you must set up the IP address, subnet mask, and default gateway that is compatible with your network infrastructure. If it is not correctly setup, the power meter is not be visible on your network.

- 1 Switch the power on to the power meter.

NOTE

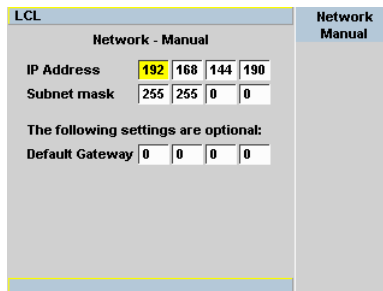
If you configure an invalid IP address or an IP address that is used by another device or host, an error message is generated. This error can be read by pressing

, **Error List** or by using the `SYSTEM:ERRor?` command.

- 2 Press , **Remote Interfaces** to display the Remote Interface display (see [Figure 1-2](#)).
- 3 Press **Network Manual** to set the IP Address, Subnet Mask. The Default Gateway value is an optional setting.


To individually specify the settings use the arrow keys, Select key, and use the numeric keys followed by **Enter** keys to enter the required IP address, subnet mask, and default gateway.

The values can range between 0.0.0.0 and 255.255.255.255.




LCL		Network - Manual				Network Manual	
IP Address	192	168	144	190			
Subnet mask	255	255	0	0			
The following settings are optional:							
Default Gateway	0	0	0	0			

Figure 1-4 Typical Manual Entry LAN Network Interface

- 4 Press , to return to the Remote Interface display.
- 5 Press **Restart Network**.

A pop-up appears for 5 seconds (see [Figure 1-3](#)). Monitor the Status at the bottom of the Remote Interface display to see when the server has assigned an address.

- 6 Press , to return to a measurement screen.
- 7 If you intend to program over LAN or use such programs, make sure you have installed I/O software on your PC.
- 8 Use the Connection Expert utility of the IO Libraries Suite to add the power meter and verify a connection.

NOTE

If you have installed other I/O software, refer to documentation that accompanies the software.

- 9 You can use various programming environments to control the power meter. For an overview about programming instruments via LAN, refer to the connectivity guide.

Configuring the LAN Remotely

To automatically configure the LAN settings enable DHCP operation using the `SYSTEM:COMMunicate:LAN:DHCP[:STATE]` command.

To individually specify the settings use the following commands:

- `SYSTEM:COMMunicate:LAN:ADDRess`
- `SYSTEM:COMMunicate:LAN:SMASk`
- `SYSTEM:COMMunicate:LAN:DGATeway`
- `SYSTEM:COMMunicate:LAN:AIP[:STATe]`
- `SYSTEM:COMMunicate:LAN:REStArt`

GPIB

- 1 Install, or make sure you have installed, I/O software on your computer.
- 2 Follow your GPIB interface card vendor's instructions for installing GPIB hardware on your computer.
- 3 Connect a GPIB cable between your computer and the power meter.
- 4 Configure the installed GPIB card as the vendor instructs.
- 5 Use the Connection Expert utility of IO Libraries Suite to verify that the power meter is displayed under the GPIB interface definition.

NOTE

If you have installed other I/O software, refer to documentation that accompanies the software.

- 6 You can use various programming environments to control the power meter. For further information, refer to your GPIB card vendor's guide.

Refer to the refer to the connectivity guide and the programming guide for an overview about programming the power meter.

Changing the GPIB Address

The GPIB address is an integer between 0 and 30. The power meter is shipped with a default address set to 15. The GPIB address is stored in non-volatile memory.

To change the GPIB address manually proceed as follows:

- 1 Press  , **Remote Interfaces**.

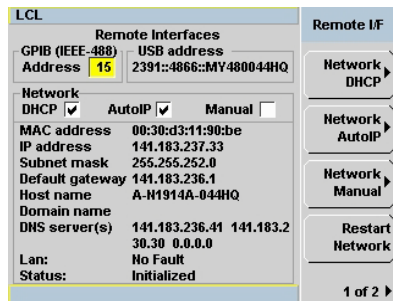



Figure 1-5 Typical GPIB Remote Interface

- 2 Use the arrow keys to highlight GPIB Address entry field.
- 3 Press  and use the numeric keys to enter the GPIB address in the Pop-up.
- 4 Press the Enter key

To change the address remotely.

You can set/query the GPIB address remotely using the following command
`SYSTEM:COMMunicate:GPIB:ADDRESS.`


Programming Language Selection (Option 200)

The programming language selection is available as an orderable option. For N1913A, you can use SCPI, HP 436A, or HP 437B programming language to program the power meter from the remote interface. For N1914A, you can use either SCPI or HP 438A programming language to program the power meter from the remote interface. The default language is SCPI when the power meter is shipped from the factory.


The power meter complies with the rules and regulations of the 1996.0 version of SCPI (Standard Commands for Programmable Instruments). You can determine the SCPI version with which the power meter is in compliance by sending the **SYSTEM:VERSion?** command from the remote interface. You cannot query the SCPI version from the front panel.

The language selection is stored in non-volatile memory and does not change when power has been off or after a remote interface reset.

To select the interface language from the front panel (N1913A),

- 1 Press  , **Remote Interfaces, 1 of 2**, and **Command Set**.
- 2 Select the language from **HP 436A**,^[1] **HP 437B**^[1], and **SCPI**^[2].

To select the interface language from the front panel (N1914A),

- 1 Press  , **Remote Interfaces, 1 of 2**, and **Command Set**.
- 2 Select the language from **HP 438A**^[1], and **SCPI**^[2].

To select the interface language from the remote interface, use the **SYSTEM:LANGUage** command.

NOTE

Option 200 can only support 8480 series, N8480 series CFT-option, and E4412/3A power sensors.

[1] HP 436A, HP 437B, and HP 438A language modes are not compatible with LAN or USBTM remote interface.

[2] SCPI is the default programming language. License is needed for other programming languages to be available.

Rack Mounting the Power Meter

Rack Mounting Information

Disconnect Device Requirements

In rack mounting operation a disconnect device, for example, an IEC320 appliance coupler, must be used. Consideration must be given to the following when installing the power meter in a rack:

- An adequately rated switch (250V, 10A) or circuit breaker (250V, 5A) shall be included in the rack.
- It should be in close proximity to the power meter and within easy reach of the operator.
- It shall be marked as a disconnect device.

Ventilation Requirements

When installing the power meter in a cabinet, the convection into and out of the power meter must not be restricted. If the total power dissipated in the cabinet is greater than 800 Watts, then forced convection must be used.

Rack Mounting One Meter (Using the Option 908 rack mount kit)

- 1 Remove the carrying handle.



- 2 Remove the front and rear rubber bumpers.



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- 3** Fit the rack mount flanges.
(Parts available separately: 5063-9240).



- 4** Ready for installation.



Rack Mounting Two Meters Together (Using the Option 909 rack mount kit)

- 1 Remove the carrying handle.



- 2 Remove the front and rear rubber bumpers.



- 3 Hardware required to link meters together.

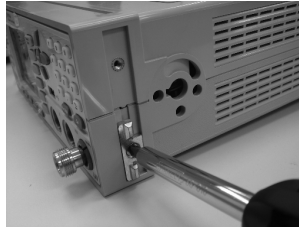


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- 4** Fit one small rack mounting flange to opposite sides of each power meter. (Parts available separately: 5061-9694 and 5063-9212).



- 5** Fit two front linking plates to each power meter.



- 6** Engage the linking plates at the front of the power meters.



7 Attach the rear linking brackets.



8 Ready for installation



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2 Characteristics and Specifications

For the characteristics and specifications of the N1913/1914A EPM Series Power Meter, refer to the datasheet at

<http://literature.cdn.keysight.com/litweb/pdf/5990-4019EN.pdf>.

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This information is subject to change without notice. Always refer to the English version at the Keysight website for the latest revision.

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