

# Smart Power Sensor

**PWR-8GHS-RC**

50Ω -30 dBm to +20 dBm, 1 MHz to 8000 MHz

## The Big Deal

- Low cost
- **USB or Ethernet** control
- Includes GUI with measurement applications software, simplifying complex measurements
- Measurement speed 30msec



Software Package

CASE STYLE: JL1941

## Product Overview

The Mini-Circuits PWR-8GHS-RC Smart Power Sensor is a pocket-sized, 4.95" x 1.74" x 1.08", precision test device, controlled via USB or Ethernet, that turns your Windows® or Linux® PC into a power meter. All specifications provided apply to continuous wave (CW) signals. Each unit is shipped with our N-to-SMA adapter, a quick-locking "Y" control cable for reliable connectivity for both USB and Ethernet control, and a power adapter with a USB type A connector. Native software and detailed user guides are available for download from <http://www.minicircuits.com/softwaredownload/pm.html> anywhere an internet connection is available, providing a full range of data analysis options.

## Key Features

Feature	Advantages
Ethernet-TCP/IP- HTTP and Telnet Protocols (Supports DHCP and Static IP)	The PWR-8GHS-RC power meter can be controlled from any Windows®, Mac®, or Linux® computer, or even a mobile device with a network connection and Ethernet-TCP/IP (HTTP or Telnet protocols) support. Using a VPN would allow remote control from anywhere in the world.
USB control	User may also control the power sensor via USB connection. Plug-and-Play, no driver required. Compatible with Windows® or Linux® operating systems using 32 and 64 bit architecture(up to 24 sensors simultaneously).
GUI program with USB and Ethernet interfaces	Allows quick and easy measurement, average measurements, data recording, and more.
'Measurement Application' GUI software built-in	Automated measurement setups which allow the user to perform measurements on RF components such as Couplers, Filters, Amplifiers etc... , display numerical data and graphs, and analyze the data.
32/64 bit operating systems	Compatible with Windows® and Linux® operating systems (Mac® for Ethernet control only).
No calibration required before taking measurement	The PWR-8GHS-RC does not require any reference signal for calibration.
5V power supply	Powered via USB plug from PC, AC/DC adapter or from commercially available Power Over Ethernet (PoE) splitter with 5V output.

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# Smart Power Sensor

PWR-8GHS-RC

50Ω 1 MHz to 8000 MHz

## Product Features

- USB or Ethernet control
- Supports HTTP and Telnet network protocols
- Wide bandwidth, 1 to 8000 MHz
- 50 dB Dynamic Range, -30 to +20 dBm
- Good VSWR, 1.1:1 typ.
- Fast measurement speed, 30 msec typ.
- Automatic frequency calibration & temperature compensation
- Multi-sensor capability (up to 24)
- Built in 'Application Measurement' software
- User-friendly Windows® Graphical User Interface
- Supports a wide range of programming environments (See application note [AN-49-001](#) for details)



Software Package

CASE STYLE: JL1941

## Typical Applications

- Production testing systems
- Field testing
- Remote location monitoring
- Automatic, scheduled data collection
- Evaluate high-power, multi-port devices with built-in virtual couplers/attenuators & other software tools

### RoHS Compliant

See our web site for RoHS Compliance methodologies and qualifications

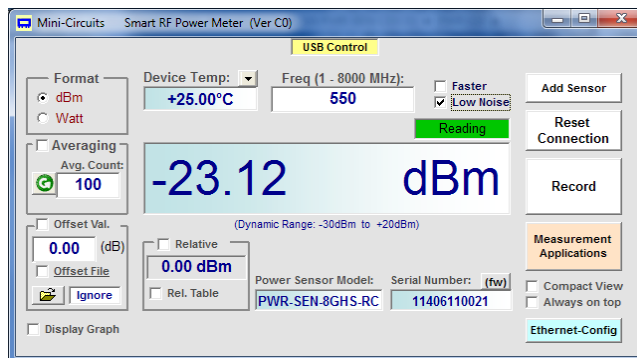
Model No.	Description
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PWR-8GHS-RC	USB/Ethernet smart Power Sensor
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### Included Accessories

PWR-SEN-8GHS-RC	Power Sensor Head
USB-RJ45-CBL-7+	6.6 ft "Y" data cable (USB & RJ45)
NF-SM50+	N-Type (F) to SMA(M) Adapter

## Mini-Circuits Power Meter Program for Smart Power Sensors



For programming instructions, see [programming manual](#) on Mini-Circuits' website.

For installation instruction and overview of power sensor functions, see [user guide](#) on Mini-Circuits' website.



## Electrical Specifications (CW)<sup>1</sup>, -30 dBm to +20 dBm, 1 to 8000 MHz

Parameter	Freq. Range (MHz)	Min.	Typ.	Max.	Units	
Dynamic Range <sup>2</sup>	1 - 8000	-30	-	+20	dBm	
VSWR	1 - 8000	-	1.1	1.3	:1	
Uncertainty of Power Measurement @ 25°C	@ -30 to +5 dBm <sup>3,4</sup>	1 - 3000	-	± 0.10	± 0.30	dB
		3000 - 8000	-	± 0.15	± 0.40	dB
	@ +5 to +15 dBm	1 - 3000	-	± 0.15	± 0.30	dB
		3000 - 8000	-	± 0.15	± 0.40	dB
	@ +15 to +20 dBm	1 - 3000	-	± 0.15	± 0.40	dB
		3000 - 8000	-	± 0.20	± 0.45	dB
Uncertainty of Power Measurement @ 0°C to 50°C	@ -30 to +5 dBm <sup>3,4</sup>	1 - 3000	-	± 0.20	-	dB
		3000 - 8000	-	± 0.20	-	dB
	@ +5 to +15 dBm	1 - 3000	-	± 0.20	-	dB
		3000 - 8000	-	± 0.20	-	dB
	@ +15 to +20 dBm	1 - 3000	-	± 0.20	-	dB
		3000 - 8000	-	± 0.20	-	dB
Linearity @ 25°C	1 - 8000	-	± 3.0	-	%	
Measurement Resolution	1 - 8000	0.01	-	-	dB	
Averaging Range	1 - 8000	1	-	999	-	
Measurement Speed	@ Low Noise Mode	1 - 8000	-	100	-	msec
	@ Faster Mode		-	30	-	
Supply Voltage	via USB port	4.5	5	5.5	V	
Current (via USB port, in USB control)	1 - 8000	-	180	250	mA	
Current (via USB port, in Ethernet control)	1 - 8000	-	190	250	mA	
Ethernet communication	Supports both Telnet and HTTP protocols over TCP/IP with dynamic(DHCP) or static IP					

## Minimum System Requirements

Parameter	Requirements
Interface	USB HID or HTTP Get/Post or Telnet protocols
Host operating system - USB control	<b>Windows 32/64 Bit operating system:</b> Windows 98®, Windows XP®, Windows Vista®, Windows 7®, Windows 8®, Windows 10® <b>Linux® support:</b> 32/64 Bit operating system
Host operating system - Ethernet control	Any Windows®, Mac®, or Linux® computer with a network port and Ethernet-TCP/IP (HTTP or Telnet protocols) support
Hardware	Pentium® II or higher, RAM 256 MB
Y control cable for USB and Ethernet (supplied)	Power sensor to be used with the supplied control cable only

## Absolute Maximum Ratings

Parameter	Ratings
Operating Temperature	0°C to 50°C
Storage Temperature	-30°C to 70°C
V <sub>USB</sub> Max.	6V
DC Voltage at RF port	15V
CW Power	+27 dBm

<sup>1</sup> All specifications apply to continuous wave (CW) signals.

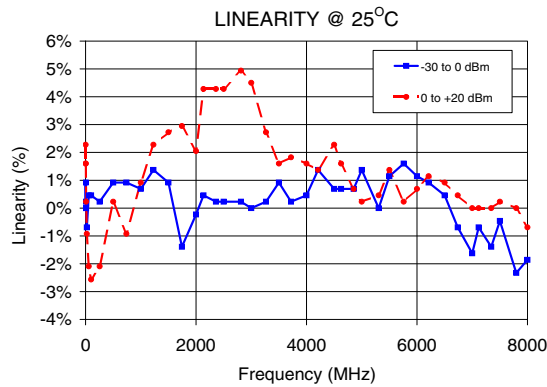
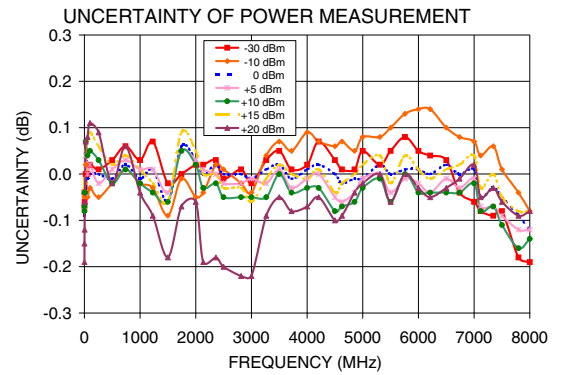
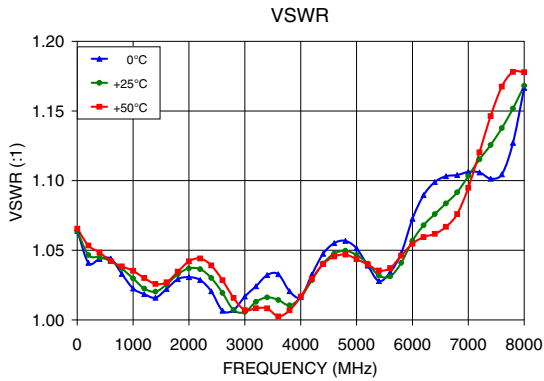
<sup>2</sup> Maximum continuous safe operational power limit: +23 dBm. Performance is guaranteed up to +20 dBm.

<sup>3</sup> When using Faster mode at high frequencies below -20dBm, use of averaging is recommended to prevent noise errors.

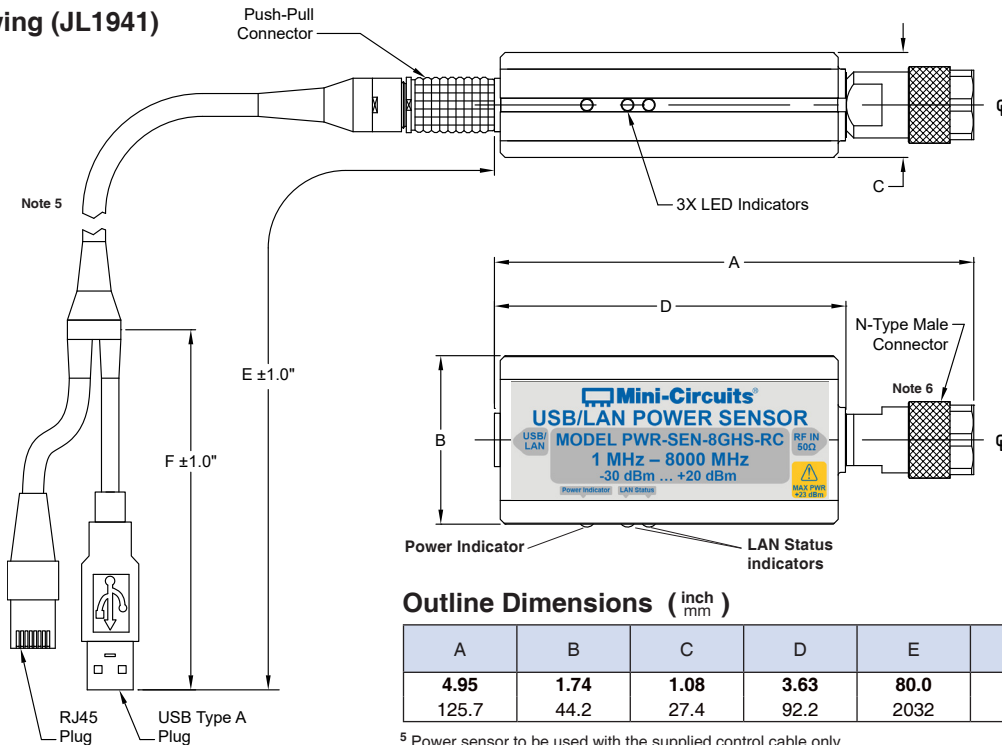
<sup>4</sup> When using Faster mode below -20dBm, uncertainty value may increase by up to 0.2 dB relative to Low noise mode

Permanent damage may occur if any of these limits are exceeded. Operating in the range between operating power limits and absolute maximum ratings for extended periods of time may result in reduced life and reliability.

## Typical Performance Curves



## Outline Drawing (JL1941)



### Outline Dimensions (inch / mm)

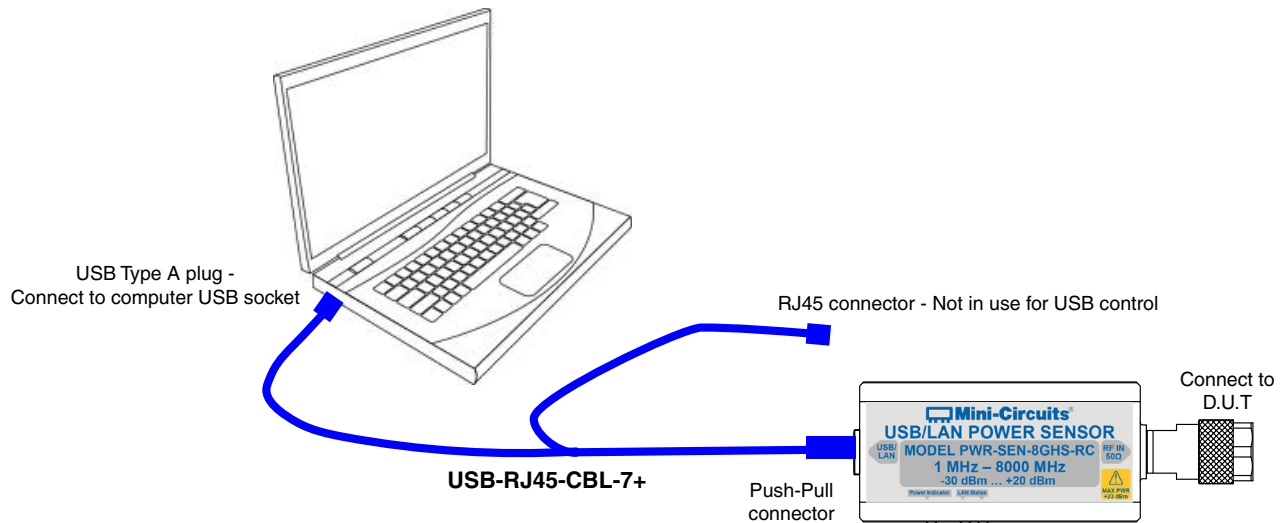
A	B	C	D	E	F	WT. GRAMS
4.95	1.74	1.08	3.63	80.0	20.0	250
125.7	44.2	27.4	92.2	2032	508	

<sup>5</sup> Power sensor to be used with the supplied control cable only.

<sup>6</sup> Maximum torque 8 in-lb (90 N-cm).

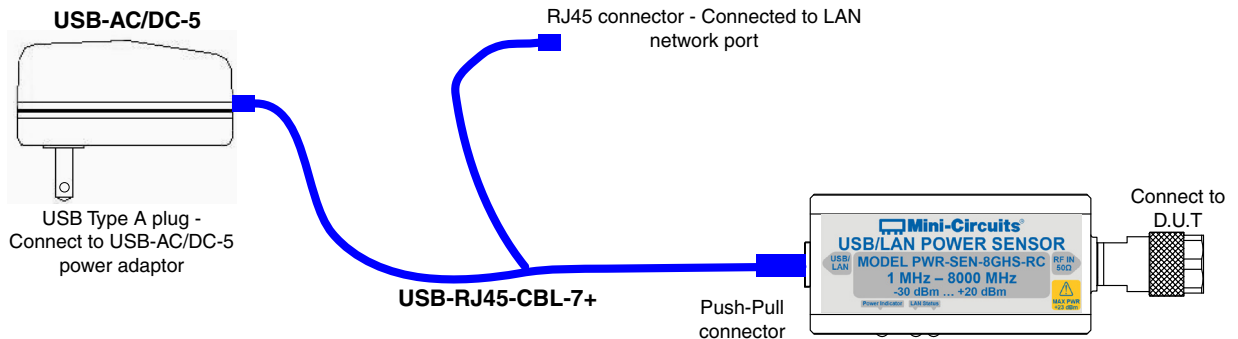
## Connection diagrams

### Connection diagram for USB control



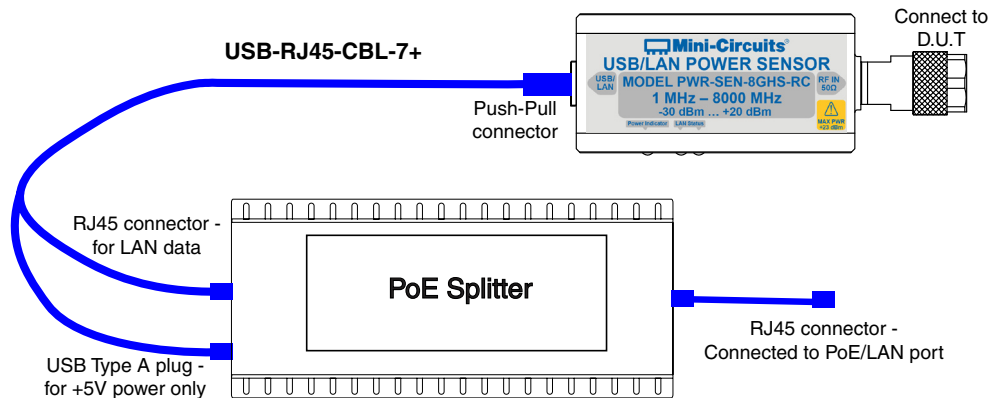
### Connection diagram for Ethernet control, using power adapter

Connect USB-AC/DC-5 to mains power






### Connection diagram for Ethernet control, using PoE system

**Note:** Commercially available PoE splitter not supplied by Mini-Circuits



## Ordering Information

Model	Description
PWR-8GHS-RC	USB/Ethernet <i>Smart Power Sensor</i>

Included Accessories	Part No.	Description
	PWR-SEN-8GHS-RC	Power Sensor Head
	USB-RJ45-CBL-7+ <sup>7</sup>	6.6 ft (2 m) "Y" data cable with USB Type-A and RJ45 plug connectors
	NF-SM50+	N-Type Female to SMA Male Adapter.

<sup>7</sup> Power sensor to be used with the supplied control cable only.

Optional Accessories	Description
PWR-SEN-CD <sup>8</sup>	Software CD
USB-AC/DC-5+(spare) <sup>9</sup>	AC/DC 5V <sub>DC</sub> Power Adapter with US, EU, IL, UK, AUS, and China power plugs
USB-RJ45-CBL-7+ (spare)	6.6 ft (2 m) "Y" data cable with USB Type-A and RJ45 plug connectors
NF-SM50+(spare)	N-Type Female to SMA Male Adapter.
NF-SF50+	N-Type Female to SMA Female Adapter
NF-BM50+	N-Type Female to BNC Male Adapter.

<sup>8</sup> To receive the CD at no extra cost, request when placing order. CD contents can be downloaded from Mini-Circuits website at <http://www.minicircuits.com/softwaredownload/pm.html>

<sup>9</sup> Power plugs for other countries are also available. Plugs for other countries are also available, if you need a power plug for a country not listed please contact [testsolutions@minicircuits.com](mailto:testsolutions@minicircuits.com).

Calibration	Description
CALSEN-8GHS-RC	Calibration Service <a href="#">Click Here</a>

## Additional Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)