Advanced Power Measurement Presentation

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- For design, verification, troubleshooting and maintenance of systems or components utilising pulsed or bursted signals (e.g. radar or Wi-Fi test applications).

- Ideal for demanding Power Measurement applications
- Technically superior performance
- Fastest Rise Times >x4
- x6 wider Video Bandwidth
- Finest Time Resolution
- smallest minimum pulse widths
- highest pulse repetition rates
- superior measurement reading rates

- **Capability of a benchtop**
- **Simplicity of a touchscreen**
- **Flexibility of USB sensors**

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# PMX40 RF Power Meter – Brief Overview

As a benchtop,

- Displays and analyzes peak and average RF power
- Frequency range from 4 kHz to 40 GHz
- Time domain and statistical analysis
- Utilizes USB power sensors vs traditional analog sensors and cables or USB sensors with adapters
- Multi-touch, touchscreen
- Provides a SCPI and LAN interface for the sensors
- Test source for sensor verification

- Utilizes up to 4 RTP or CPS series sensors
  - Enables synchronized multi-channel measurements
- Maintains industry-leading performance of sensors
  - Video bandwidth (195 MHz) and rise time (3 ns)
  - Industry-leading time resolution as fine as 100 ps
  - Industry-leading 100,000 measurements per second
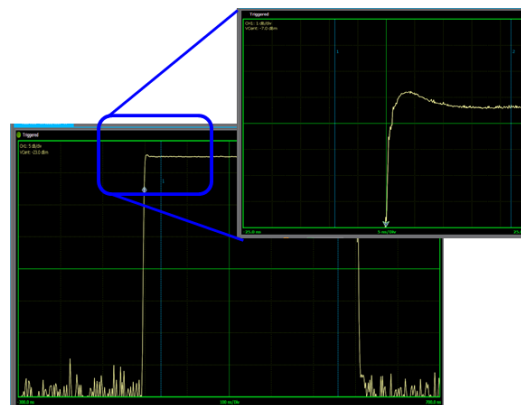
- Sensors detach for standalone operation

THE Leading USB Peak Sensors (RTP5000)

Competitive Product
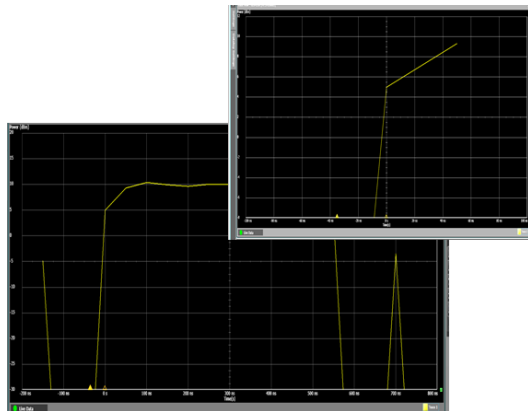
Poor time resolution causes edge instability

RTP5000 Series

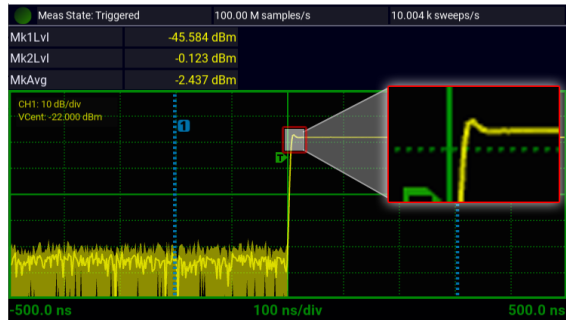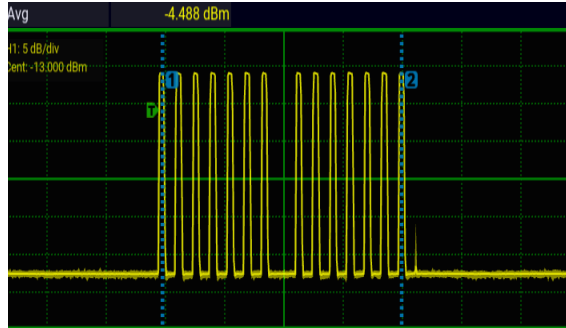

Enhanced time resolution for superior waveform fidelity

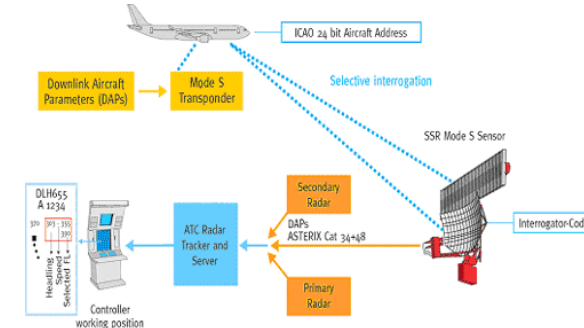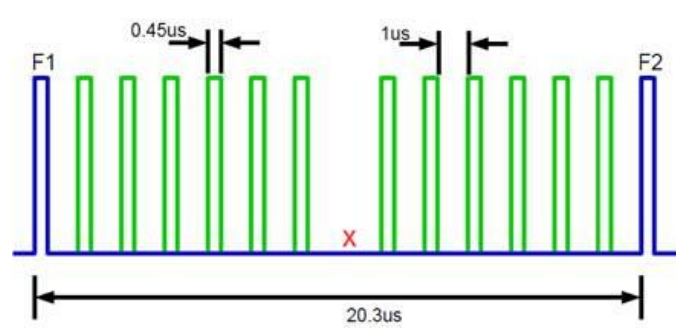| What sets us apart?	
Real-time measurement processing	• Boonton's unique Real-Time Power Processing™ is employed in the RTP5000 Series
Fastest rise time	• < 3 ns vs 13 ns; > 4x faster
Wider video bandwidth	• 195 MHz vs 30 MHz; > 6x wider
Greater time resolution	• Equivalent effective sampling provides 100 ps resolution; 10 x better
Narrower pulse width measurements	• 10 ns vs 50 ns; 5x narrower measurement capability
Higher pulse repetition frequency capability	• 50 MHz vs 10 MHz; 5x higher
Wider trigger range and more stable	• +20 dBm to -38 dBm (58 dB); < 100 ps trigger jitter
Longer viewing range	• Virtually unlimited (memory buffer mode) vs 1 s
Faster measurement rates	• 100k measurements (average, peak, and minimum) / s vs 50k (single value) / s for limited measurement count
More accessible software	• Full features standard – no options to purchase; distribute freely to other workstations • Examples for LabVIEW, MATLAB, C++, C#, VB

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- Secondary Surveillance Radar (SSR) design, verification, troubleshooting, and maintenance


- **Industry-leading rise time (<3 ns)** enables characterization of the most demanding radar signals.

- Utilize the **superior 100 ps time resolution** to zoom and uncover signal characteristics that might otherwise be missed.

Param	CH1	CH2
Width	30.080 µs	30.012 µs
Rise	21.061 µs	21.132 µs
Fall	22.395 µs	23.404 µs
Period	999.77 µs	999.89 µs
PRF	1.0002 kHz	1.0001 kHz
Duty	3.01%	3.00%
Offtime	969.69 µs	969.88 µs
WavAv	-14.158 dBm	-5.348 dBm
PulsAv	0.484 dBm	9.445 dBm
PulsPk	1.327 dBm	10.098 dBm
OvrSht	0.290 dB	0.110 dB

- Users can take advantage of the PMX40 **automated pulse measurement feature** to measure and calculate 16 common power and timing parameters and display the parameters of interest.
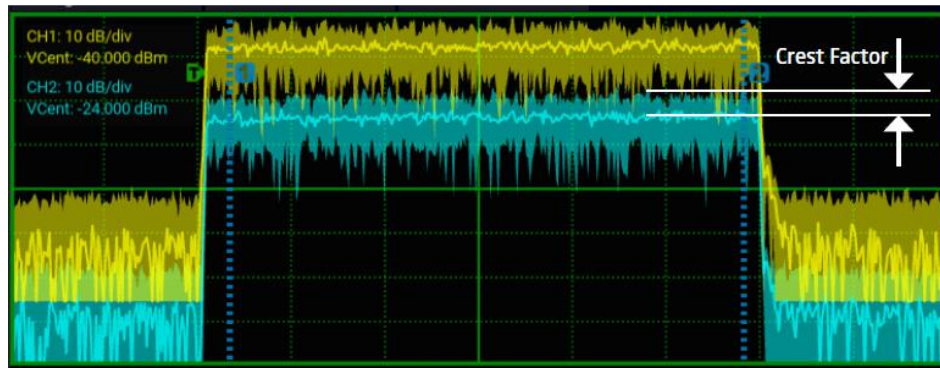
- Wi-Fi and 5G chipset and device characterization
 - WiFi6 (80 MHz and 160 MHz channels), 5G NR (100 MHz channels)

WE HAVE THE ONLY PEAK POWER SOLUTION THAT CAN ACCURATELY MEASURE THESE SIGNALS
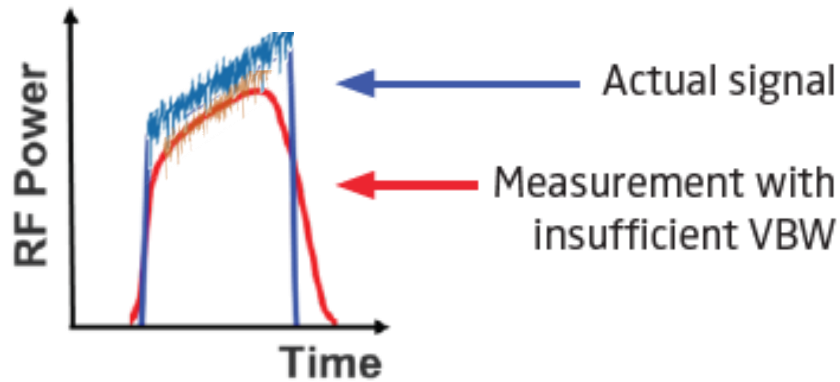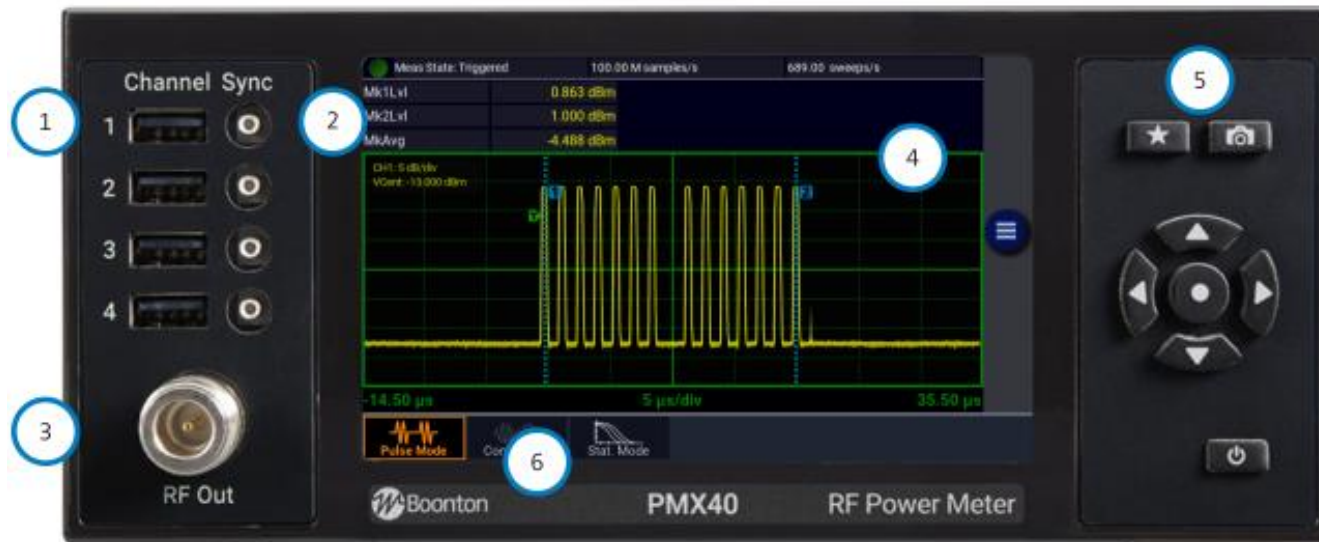

- Video bandwidth (VBW) describes the ability of a power sensor to track envelope power.
- Insufficient VBW will result in errant envelope and average power measurements.



Superior tool for amplifier linearity assessment

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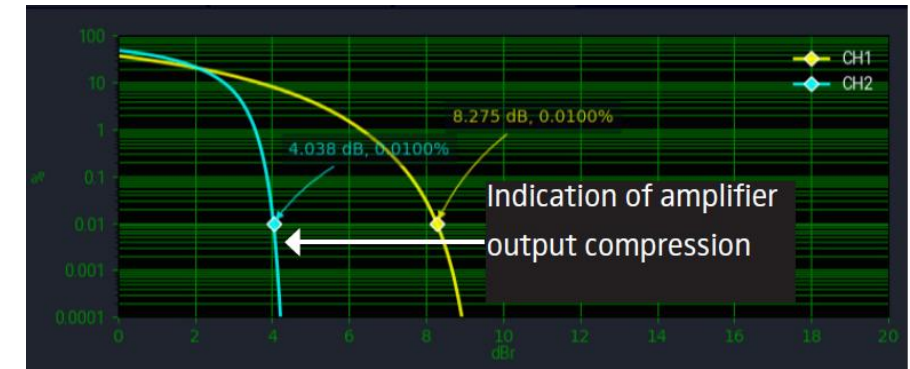
1. Connect up to 4 USB sensors for multi-channel measurements.

2. Sync ports to source or receive triggers for timing and synchronization.

3. Test source to verify sensor operation.

4. Multi-touch display with intuitive user interface.

5. One touch to quickly access presets and favorite functions.

6. **PMX40 Measurement Modes**
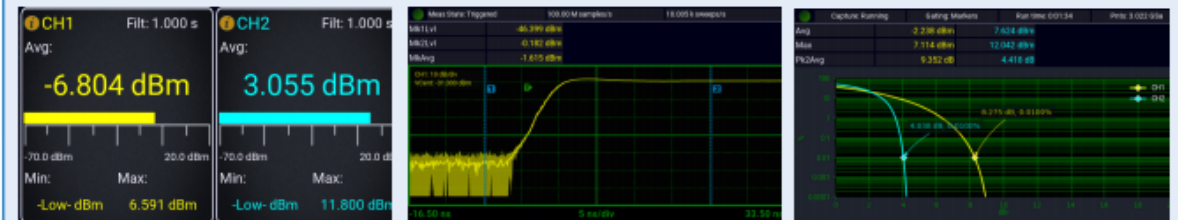
Continuous Mode

For simple, intuitive measurements of repetitive waveforms, the PMX40 Continuous Mode of operation provides a numeric display of average, maximum and minimum signal powers.

Pulsed Mode

Analysis of fast-rising single pulses or pulses with short pulse repetition intervals (PRIs) requires an instrument with sophisticated trigger and data acquisition capability. Within Pulsed Mode, more than 16 pulse parameters can be measured.

Statistical Mode

In Statistical Mode, the PMX40 plots the Complementary Cumulative Distribution Function (CCDF). The CCDF plot shows the rate of occurrence of a specific crest factor for signals, such as those used in 5G, 4G/LTE, and Wi-Fi applications.

1. Optional GPIB connectivity

2. External trigger input

3. Auxiliary sensor and Sync inputs

4. HDMI output for remote front panel display

5. LAN connectivity

6. Optional Test Source rear panel output

PMX40 comes with 2 channels by default. Customers can expand to 4 channels with a field installable software option. Any 2 or 4 channels can be used, but only 2 or 4. Notice will be displayed on screen if the user tries to exceed that number.

RTP4000 **Real-Time** *True Average* Power Sensor

Conceptual Representation

Detector Output
Detector 2 Output
Detector 3 Output
Square Law
Linear Law

True average measurements enable accurate analysis of MODULATED signals, virtually *regardless of modulation bandwidth*

- **4 kHz** to 6 GHz Frequency Range
- -60 dBm to +20 dBm Dynamic range
- **100,000 measurements per second**
- **Real-Time Power Processing™** means no measurement latency, no missed events
- Powerful, flexible, Power Analyzer PC software simplifies power measurements
- **Synchronized multi-channel measurements**
- Ideal for Wi-Fi, LTE/5G, EMI/EMC and Scalar Measurements

RF IN

Range A

Range B

Range C

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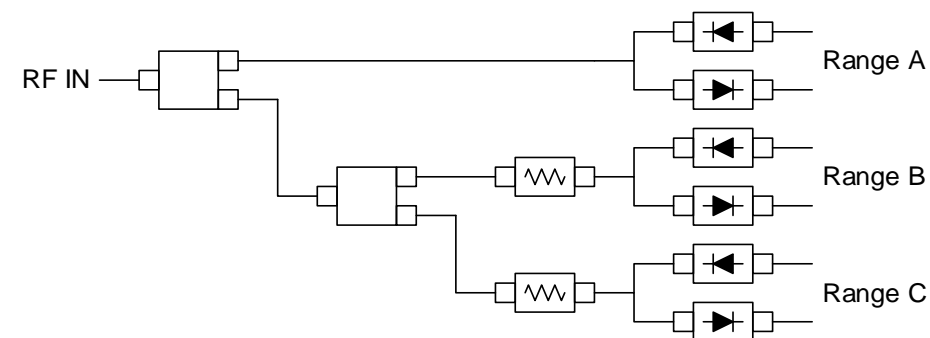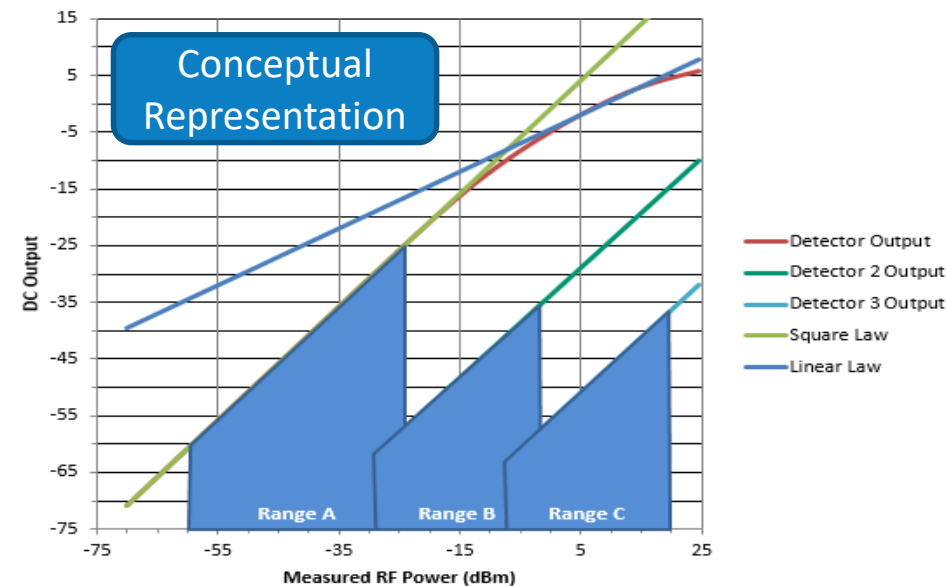
Comprehensive **Power Analyzer** Software Package

Free of charge software package for RTP series sensor control, measurement configuration, and analysis

Features include:

- Data displayed as numerical meter or waveform trace

- Multiple marker measurements, including between marker data and marker ratios

- Automated measurements; e.g., 16 auto pulse measurements

- Statistical analysis with CCDF plot

- Export measurement data
  in .csv or .pdf formats

- Up to 8 simultaneous power
  measurement channels

- Simulation mode:
  preview functionality when a
  sensor is not available
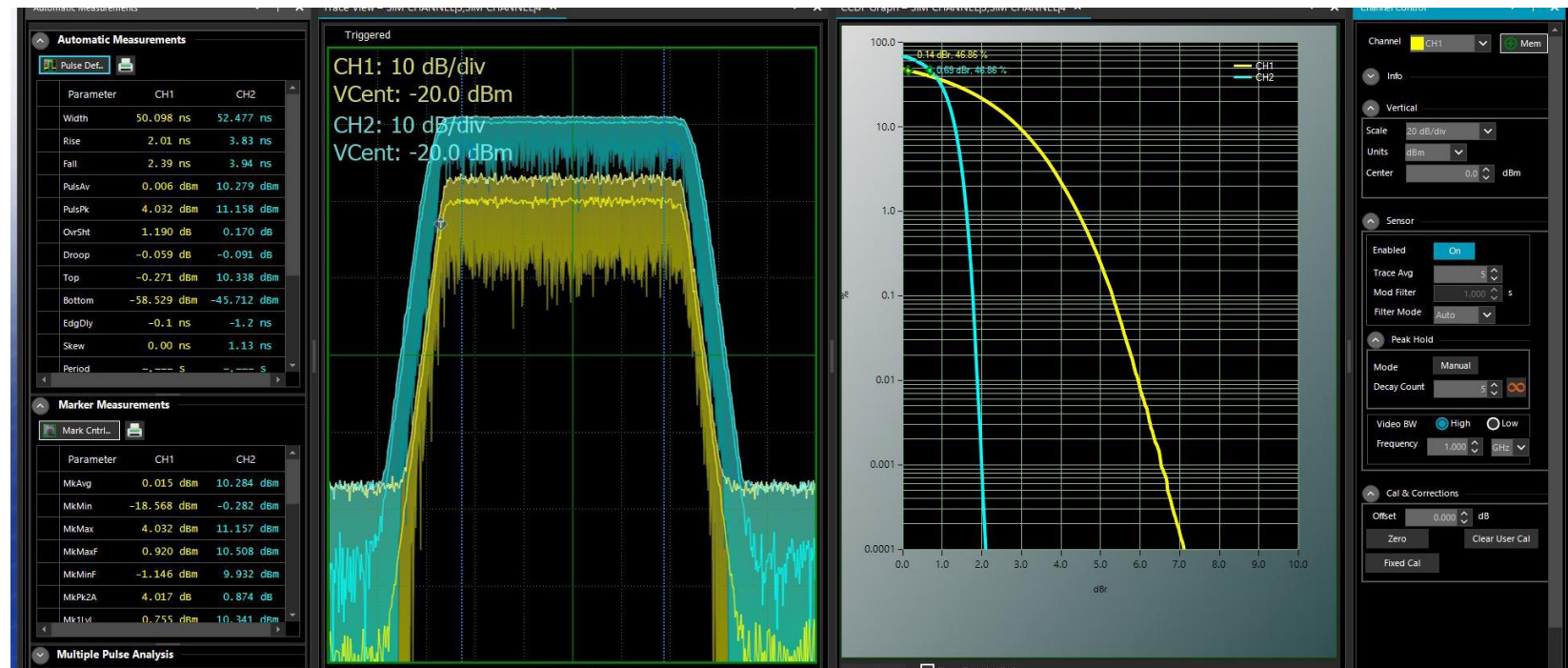
CPS2008 True Average Connected Power Sensors

Economic Sensor with
Best-in-Class Performance and
USB and LAN Connectivity

| FEAUTRE	BENEFIT
Fast measurements	• > 100 Measurements per second; • 3 -10 x faster than similar sensors
Cost Effective	• Best performance for the price in its class
True average power measurements	• for CW and bandwidth independent modulated signals
Wide frequency range	• 50 MHz to 8 GHz frequency range
Wide measurement range	• -40 dBm to +20 dBm measurement range
Standard cables/connectors with latches	• USB Type B connector with SeaLATCH and LAN RJ45 connector with PoE capability
Configurable measurement aperture	• 1 ms to 2 s
Powerful programming tools	• SCPI, IVI and LabVIEW with Windows and Linux support
More Robust Measurements	• Connect up to eight CPS2000 sensors to a single PC, hub or switch and perform simultaneous, synchronous multi-channel measurements
Intuitive user interface	• Measurements are front and center with a large numeric readout or analog. Zoom and pan through the data logging strip chart and visually inspect measurements. Quickly set frequency, aperture, averaging and offset values all from the main screen.

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Power Viewer – CPS2000 Power Measurement Software

Free of charge software package for CPS2008 sensor control, measurement configuration, and analysis
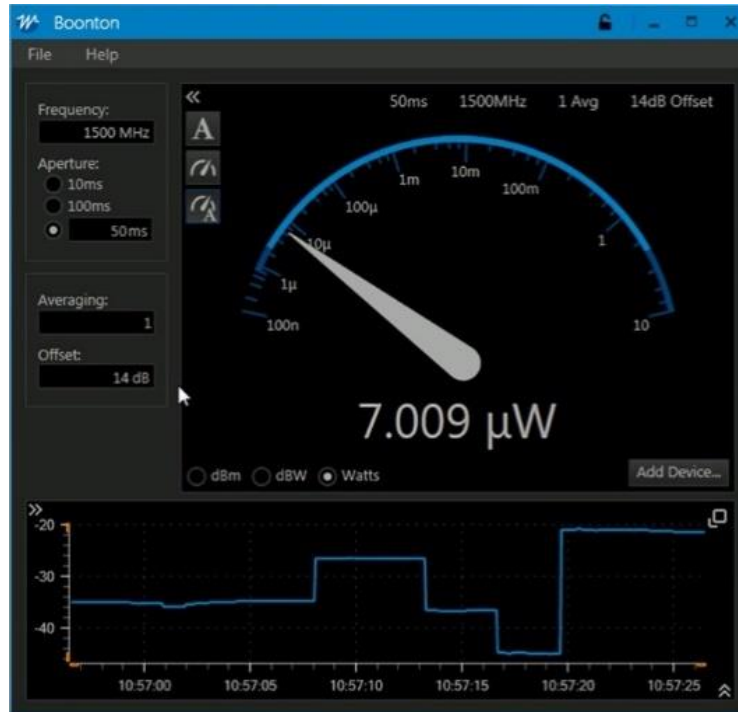
Features include:

- Large numeric readout and/or analog meter display
- Zoom and pan through data logging strip chart
- Quickly set frequency, aperture (averaging) and offset values
- Calculates ratios between sensor measurements
- Control up to 8 sensors at once
- Simulation mode: preview functionality when a sensor is not available
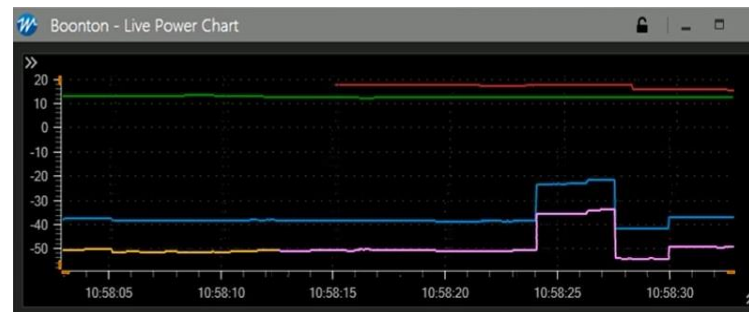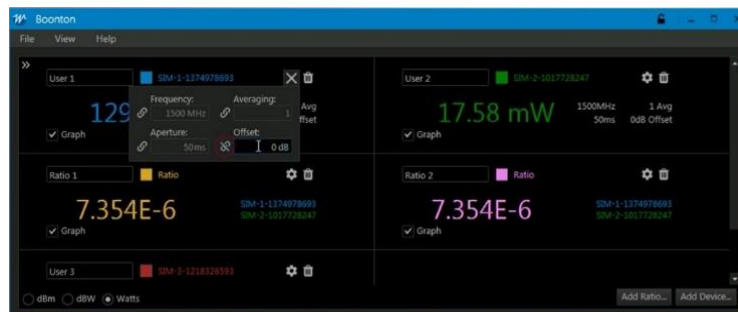
PMX40 RF Power Meter - Ordering Information

PMX40   **RF Power Meter** (includes 2 active channels)

Options

PMX40-4CH   **Adds 2 Active Channels** (for a total of 4)
PMX40-GPIB   **GPIB Control** (internally installed)
PMX40-RTS   **Moves test source output to the rear panel**

Included Accessories

Information Card (provides information on where to find latest manual versions)

Optional Accessories

PMX40-RMK   **19" Rack Mount Kit**
PMX40-TCASE   **Transit case, hold the PMX40 and up to 4 sensors**

RF Power Sensors

CPS2008	**True Average Connected Power Sensor**	**50 MHz to 8 GHz**
RTP4006	**Real-Time True Average Power Sensor**	**10 MHz to 6 GHz**
RTP4106	**Real-Time True Average Power Sensor**	**4 kHz to 6 GHz**
RTP4018	Real-Time True Average Power Sensor	10 MHz to 18 GHz
RTP4040	Real-Time True Average Power Sensor	10 MHz to 40 GHz
RTP5006	**Real-Time Peak Power Sensor**	**50 MHz to 6 GHz**
RTP5318	**Real-Time Peak Power Sensor**	**50 MHz to 18 GHz**
RTP5518	**Real-Time Peak Power Sensor**	**50 MHz to 18 GHz**
RTP5340	**Real-Time Peak Power Sensor**	**50 MHz to 40 GHz**
RTP5540	**Real-Time Peak Power Sensor**	**50 MHz to 40 GHz**

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