

GT-8550B Series USB Power Sensors

Product Overview

This product overview provides an overview of the GT-8550B Series USB Power Sensors and its accompanying power measurement software.

Five different models:

Average, Peak and Pulse Power

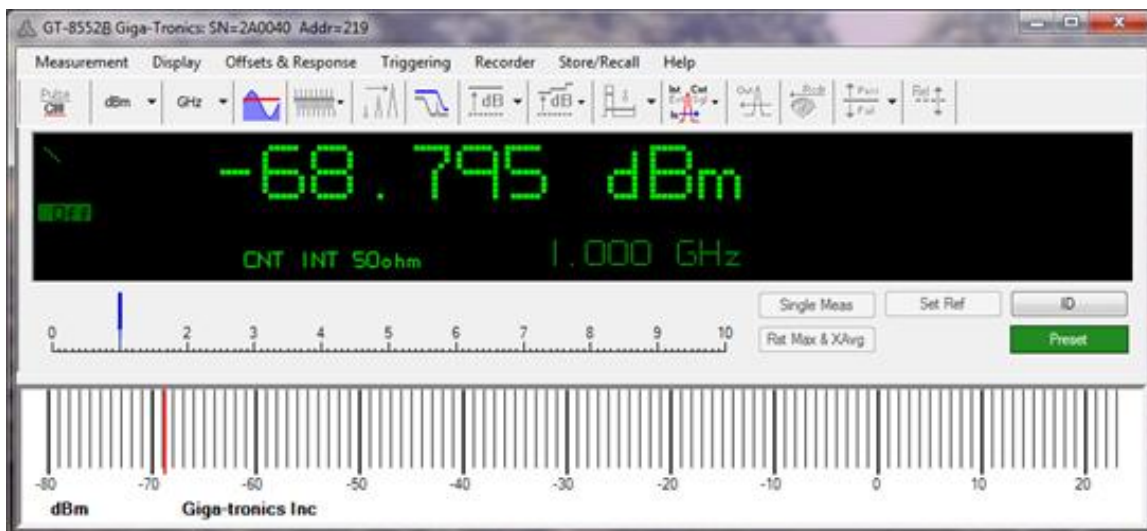
- GT-8551B: 100 MHz to 8 GHz

Average, Peak, Pulse and Pulse Profiling

- GT-8552B: 100 MHz to 8 GHz
- GT-8555B: 100 MHz to 20 GHz

True-RMS Average Power

- GT-8553B: 10 MHz to 18 GHz
- GT-8554B: 10 MHz to 26.5 GHz



Introduction

This product overview provides a detailed description of the features and capabilities of the GT-8550B USB Power Sensors and its accompanying software. The overview is intended to give engineers & technicians a high level understanding of what the product is and how it works. In addition, the different model numbers are compared to enable you to select the best model to fit your application needs.

Key Features Summary

Hardware Features

- Frequency range: 10 MHz up to 26.5 GHz
- Power range: -60 dBm up to +20 dBm
- True-RMS average power (GT-8553B and GT-8554B)
- Video (modulation) bandwidth: Up to 10 MHz
 - Measure wireless communication signals
 - Measure pulse widths as narrow as 325 ns
- Make measurements fast: Up to 2000 measurements per second
- Easy to use software comes free with all USB Power Sensors
 - Use in ATE environment by using the dynamic link libraries (DLL)
- No need to ever zero or make a front panel power calibration
 - No downtime related to zeroing or for a front panel calibration
 - Useful in remote monitoring applications
- Internal and external triggering

Software Features

- Pulse Profiling Mode (power versus time graph) – (GT-8552B and GT-8555B)
 - Time gated measurements: Peak Power, Average Power, Crest Factor, Droop, Overshoot, Rise Time, Fall Time, Duty Cycle, Pulse Repetition Frequency (PRF), Pulse Repetition Interval (PRI) and Pulse Width
- Pulse measurements – (GT-8551B, GT-8552B and GT-8555B)
 - Power meter display that provides quick measurements of parameters such as: peak and pulse power, average power, min and max power and duty cycle
- Relative and Offset power, and Pass/Fail limit mode
- Strip Chart – Data Logger
- Power Statistics Chart – (GT-8552B and GT-8555B)

Applications

- Radar
- Wireless Communications
- Field test, R&D, and maintenance
- Component test



Six Different USB Power Sensor Models

The GT-8550B series consist of six different model numbers. See Table 1. The GT-8551B, GT-8552B and GT-8555B can measure average, peak and pulse power. The GT-8552B and GT-8555B provide pulse profiling capability. The GT-8553B and GT-8554B measure CW signals (average power) only.

Table 1: GT-8550B Series USB Power Sensors Model Number Comparison

Parameter	Sensor Model				
	GT-8551B	GT-8552B	GT-8553B	GT-8554B	GT-8555B
Frequency Range	0.1 to 8 GHz ¹	0.1 to 8 GHz ¹	0.01 to 18 GHz	0.01 to 26.5 GHz	0.1 to 20 GHz
Power Range	-60 to +20 dBm	-60 to +20 dBm	-50 to +20 dBm	-50 to +20 dBm	-40 to +20 dBm
Power Measurements	Average, Pulse, Peak, Crest Factor, Min, Max and Duty Cycle	Average, Pulse, Peak, Crest Factor, Min, Max and Duty Cycle	True-RMS Average, Min & Max	True-RMS Average, Min & Max	Average, Pulse, Peak, Crest Factor, Min, Max and Duty Cycle
Measurement Modes	CW, Peak & Pulse	CW, Peak & Pulse Profiling	CW	CW	CW, Peak & Pulse Profiling
Time Gated Measurements	None	Pulse Profiling: plot power vs. time and measure the following parameters: Rise & Fall Time, Duty Cycle, Pulse Repetition Frequency, Pulse Repetition Interval, Pulse Width, Droop and Overshoot	None	None	Pulse Profiling: plot power vs. time and measure the following parameters: Rise & Fall Time, Duty Cycle, Pulse Repetition Frequency, Pulse Repetition Interval, Pulse Width, Droop and Overshoot
Other Measurements	Strip Chart	Power Statistics (PDF, CDF, CCDF), Strip Chart	Strip Chart	Strip Chart	Power Statistics (PDF, CDF, CCDF), Strip Chart
Types of Signals Measured	CW, Modulated, Burst & Pulsed	CW, Modulated, Burst & Pulsed	CW	CW	CW, Modulated, Burst & Pulsed
Video Bandwidth	10 MHz	10 MHz (pulse widths down to 325 ns)	100 Hz	100 Hz	10 MHz (pulse widths down to 325 ns)
Triggering Capabilities	No	Yes	No	No	Yes

GT-8550B Series USB Power Sensor Setup

Using the USB power sensor is very fast and easy. Simply connect a standard USB cable to the sensor and connect the other end to the computer's USB 2.0 or higher port. See figure 1. To connect multiple sensors, a USB self-powered hub may be required. Up to 12 power sensors can be connected.

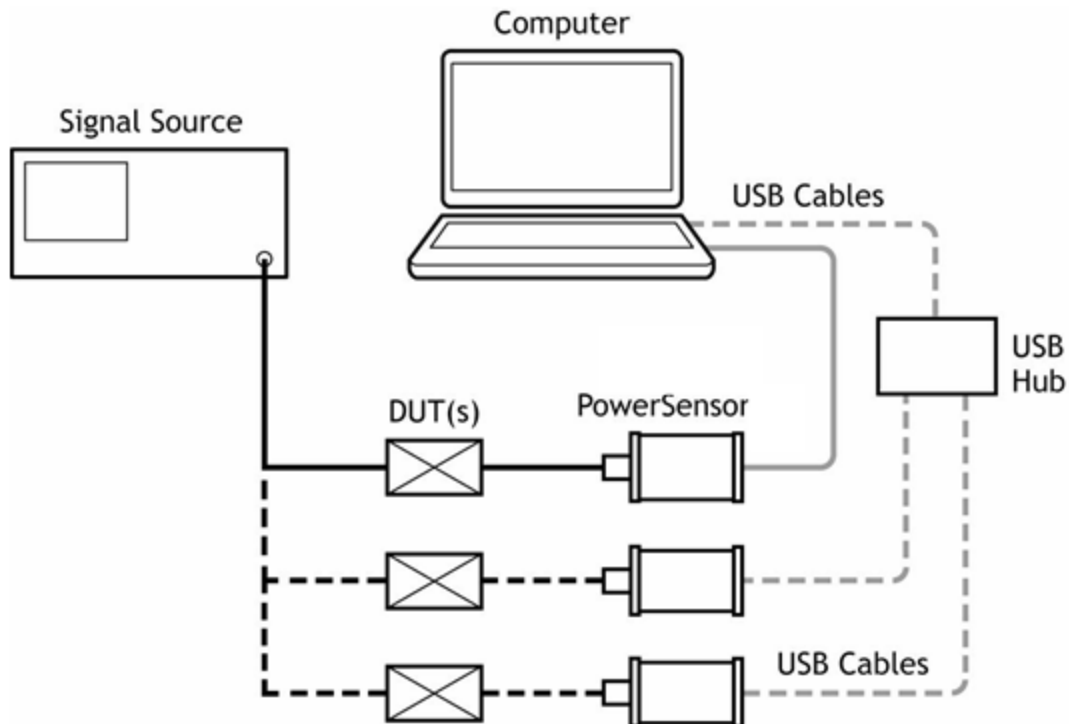


Figure 1: GT-8550B Series USB Power Sensor Setup

The computer provides all the power one sensor needs. The sensor measures the RF power from the device under test, performs the necessary signal conditioning and converts the signal to a digital format. The data is then transferred over the USB bus to the computer. The Giga-tronics software displays the measurement results.

Unlike conventional bench-top power meters, power sensor combinations, there is no need to zero the sensor or calibrate the sensor to an external reference. Thus it is ideal for field portable measurements or remote monitoring applications.

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GT-8550B Series USB Power Sensor Connectors

The USB power sensor comes in a lightweight ruggedized case. See figure 2.



On the back end of the sensor, an SMB female connector provides for a trigger input signal. Only the GT-8552B and GT-8555B models have triggering capabilities. A green LED indicates the computer's connectivity status.

Dimensions:

- GT-8551B, GT-8552B: 2" x 2.5" x 3"
- GT-8553B, GT-8554B and GT-8555B: 2" x 2.5" x 3.5"

Weight: < 1 pound

Measurement Software

After you connect the USB power sensor to the computer's USB port, the software can be used to quickly and easily display the measured results. The software is a graphical user interface that works with the GT-8550B series USB power sensors. It comes free with every power sensor and may be downloaded from the Giga-tronics web site. It is compatible with these operating systems: Microsoft® Windows XP, Vista (32) or Windows 7 (32 or 64).

When the software is first launched, it automatically detects all the sensors that are connected to the PC. The Connection Selection window shown in figure 3 below indicates that two USB power sensors are connected to the computer. Multiple sensors can be connected to enable you to make multi-channel power measurements. Depending on the amount of sensors you want to connect, a USB hub may be required. Up to 12 sensors will be recognized by the software.

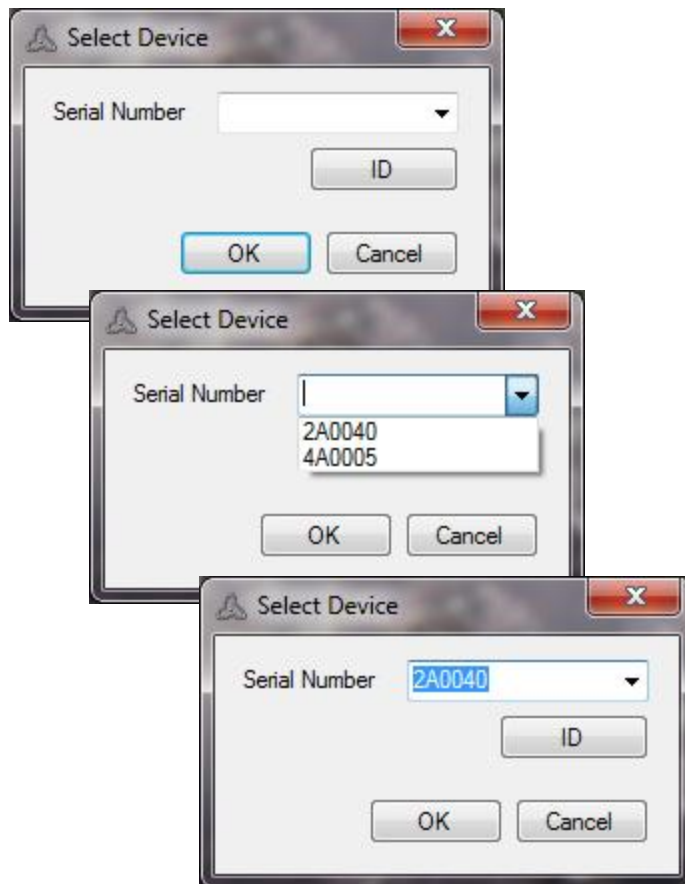


Figure 3: Sensor connection selection menu example for two sensors

Measurement Modes

CW Measurement Mode

In CW (continuous wave) mode, the instantaneous average and minimum and maximum average power is measured and displayed. When the CW measurement mode is selected, the CW power meter panel is displayed. See figure 4. CW measurement mode is available on all models of power sensors. This mode is recommended for measuring signals that are not burst or pulsed and have no amplitude modulation.

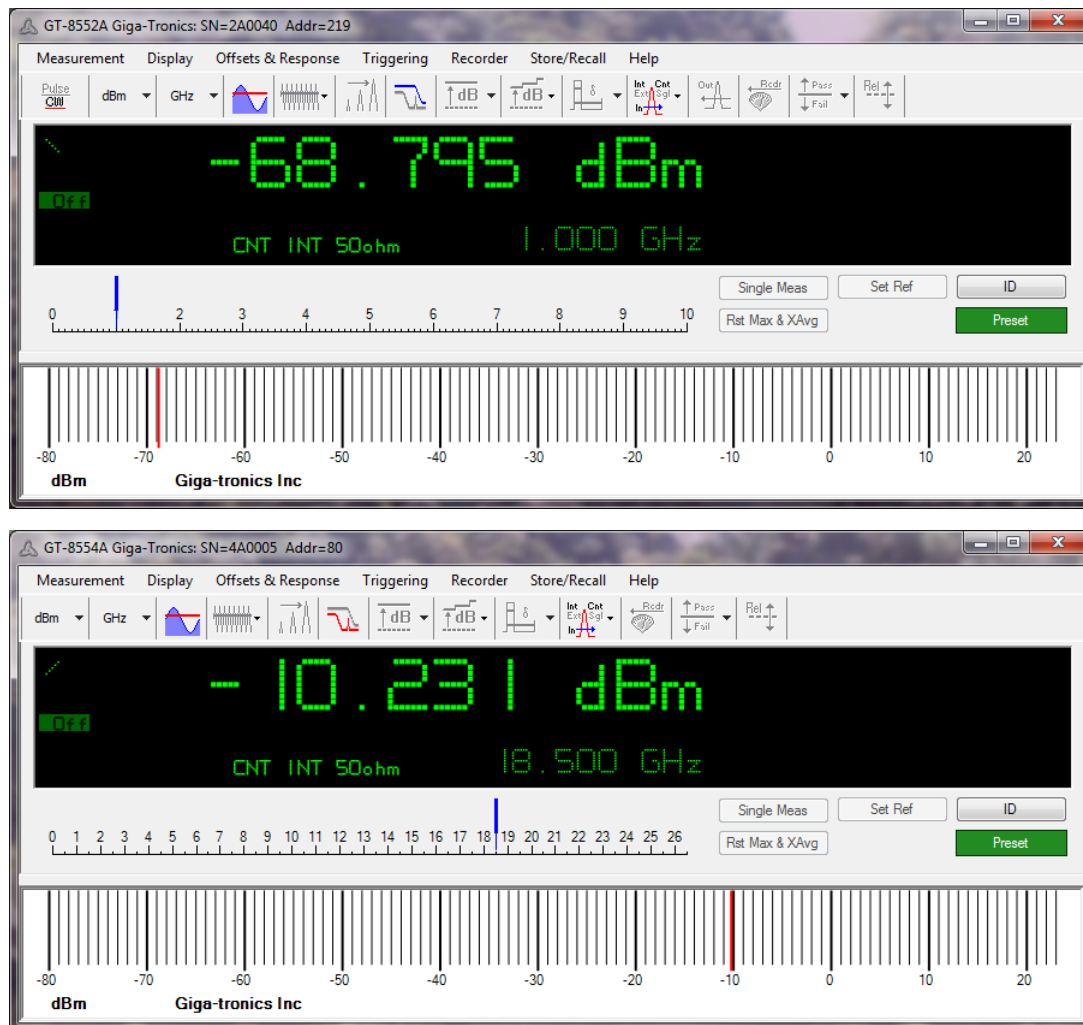


Figure 4: Measurement displays for GT-8552B in CW mode and GT-8554B (CW only)

In CW mode, a number of functions can be controlled:

- Display units: dBm, dBW, dBkW, dBuV, dBmV, dBV, Watt and Volt (50 Ohm)
- Signal frequency (MHz or GHz)
- Averaging, extended averaging
- Max Hold, Pass/Fail Limits
- Relative, Offset and Minimum Loss Pad (75 Ohm)
- Triggering: Internal, External, Single, Continuous
- Save/Recall function
- Strip Chart (Logger) function

Pulse Measurement Mode

The GT-8552B and GT-8555B have a pulse measurement mode. In pulse measurement mode, the peak power is measured and displayed. See figure 5. In addition, the average power, duty cycle and crest factor are displayed.

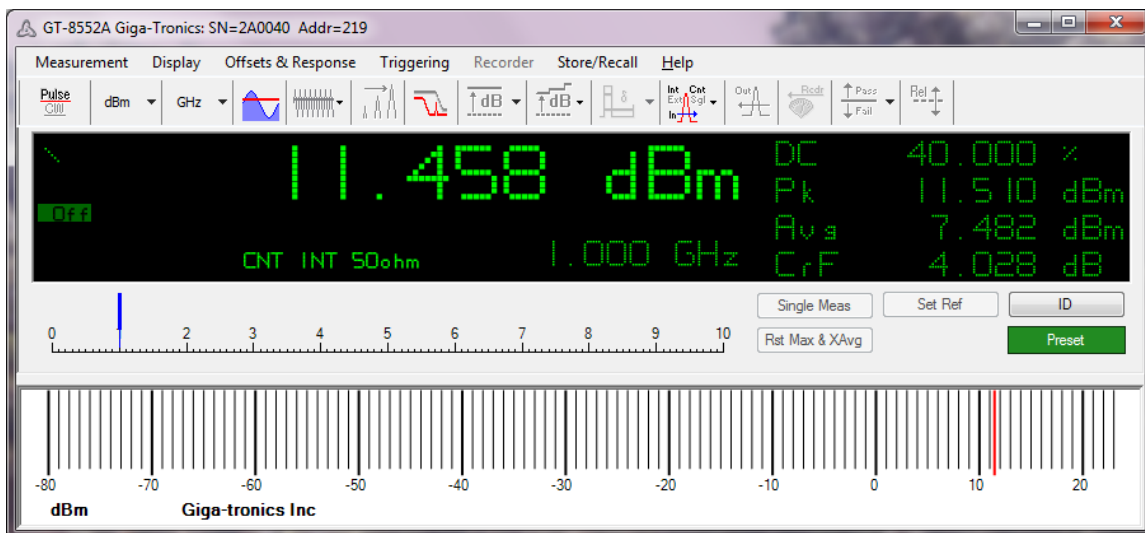


Figure 5: Pulse measurement mode display

Pulse Profiling Measurement Mode

With the GT-8552B and GT-8555B model power sensors, you also get the Pulse Profiling measurement mode. This mode enables you to display the RF power envelope versus time. See figure 6.

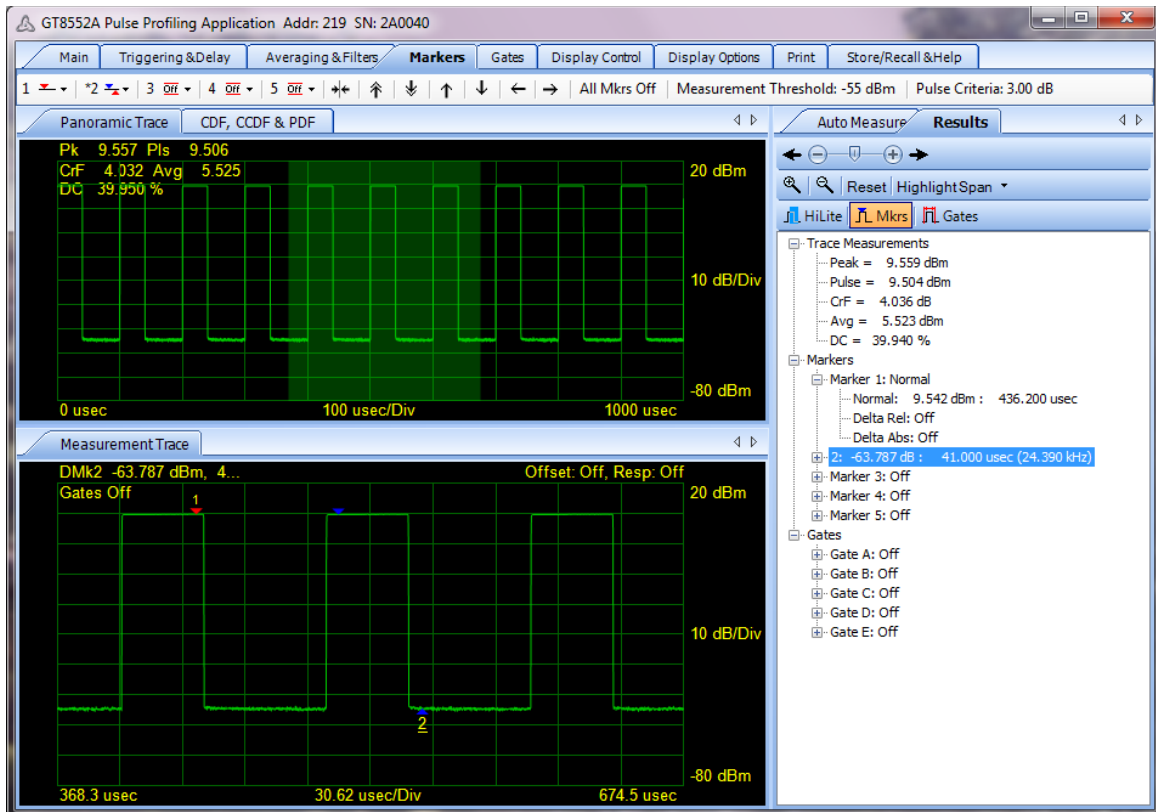


Figure 6: Pulse Profiling measurement mode displays power versus time

In this mode, you can make time gated measurements of such parameters as Peak Power, Average Power, Crest Factor, Droop, Overshoot, Rise Time, Fall Time, Duty Cycle, Pulse Repetition Frequency (PRF), Pulse Repetition Interval (PRI) and Pulse Width. Up to 6 time gates and up to 10 markers can be set. In addition, you can add a marker to the trace to make a measurement at a specific point or the difference between two points with a marker delta measurement. You can also save traces to your hard drive and recall them at a later time. Notice that in this example, one marker and a delta marker are set. The measurement parameters for each gate setting are for that particular gate time interval.

Strip Chart (Logger)

The Strip Chart (Logger) mode allows viewing varying power levels of a signal over a set period of time. This feature is available on all models of sensors. The example shown in figure 7 displays the power measured on a CW signal over about 2 minutes duration.

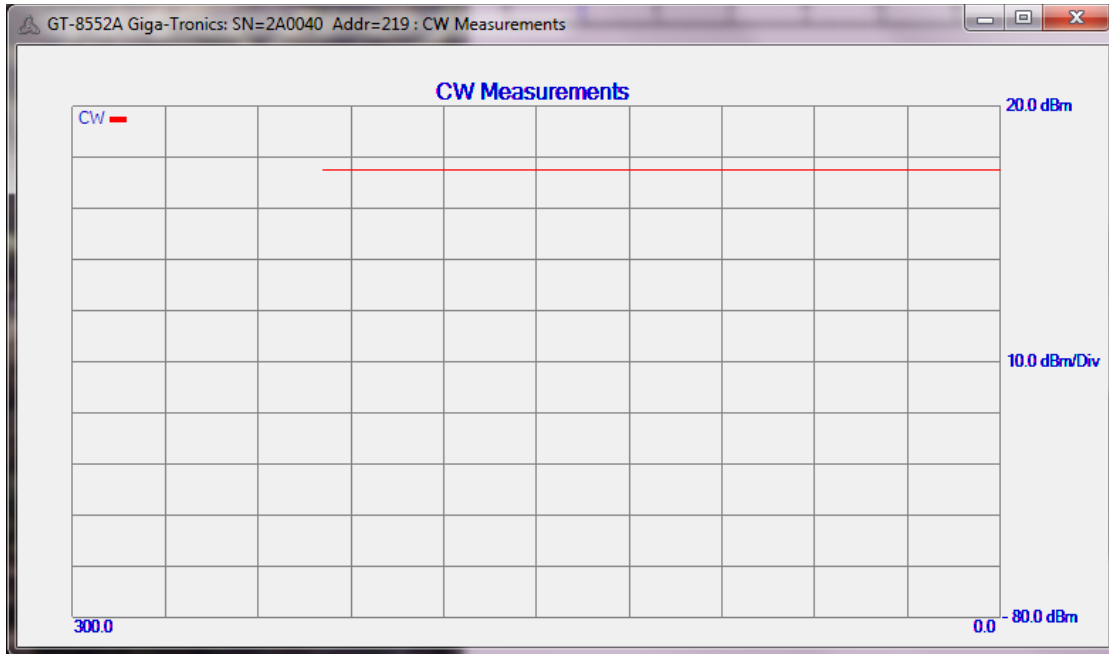


Figure 7: Strip Chart (Logger)

Remote Monitoring

These small light weight power sensors are ideal for remote monitoring applications. USB data transfer rate capabilities limit the USB cable length to 5 meters, which prohibits long distance remote monitoring. This limitation can be overcome by installing any generic low cost USB-to-LAN hub converter at the measurement site along with the power sensors. This enables remote monitoring across great distances.

For more information:

More information about the USB Power Sensors may be found from our website:

www.gigatronics.com

Data Sheets

GT-8551B USB Power Sensor

- <http://www.gigatronics.com/downloads/datasheets/GT-8551B-ds.pdf>

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- <http://www.gigatronics.com/downloads/datasheets/GT-8555B-ds.pdf>

Operation Manual

- http://www.gigatronics.com/downloads/man/GT-8550B_OpManual.pdf

Installation Guide

- http://www.gigatronics.com/downloads/man/GT-8550B_QuickStartGuide.pdf

Programming Manual

- http://www.gigatronics.com/downloads/man/GT-8550B_ProgManual.pdf

Security Instructions

- http://www.gigatronics.com/downloads/man/GT-8550B_AN-GTxxx.pdf

