Giga-tronics

Technical Datasheet

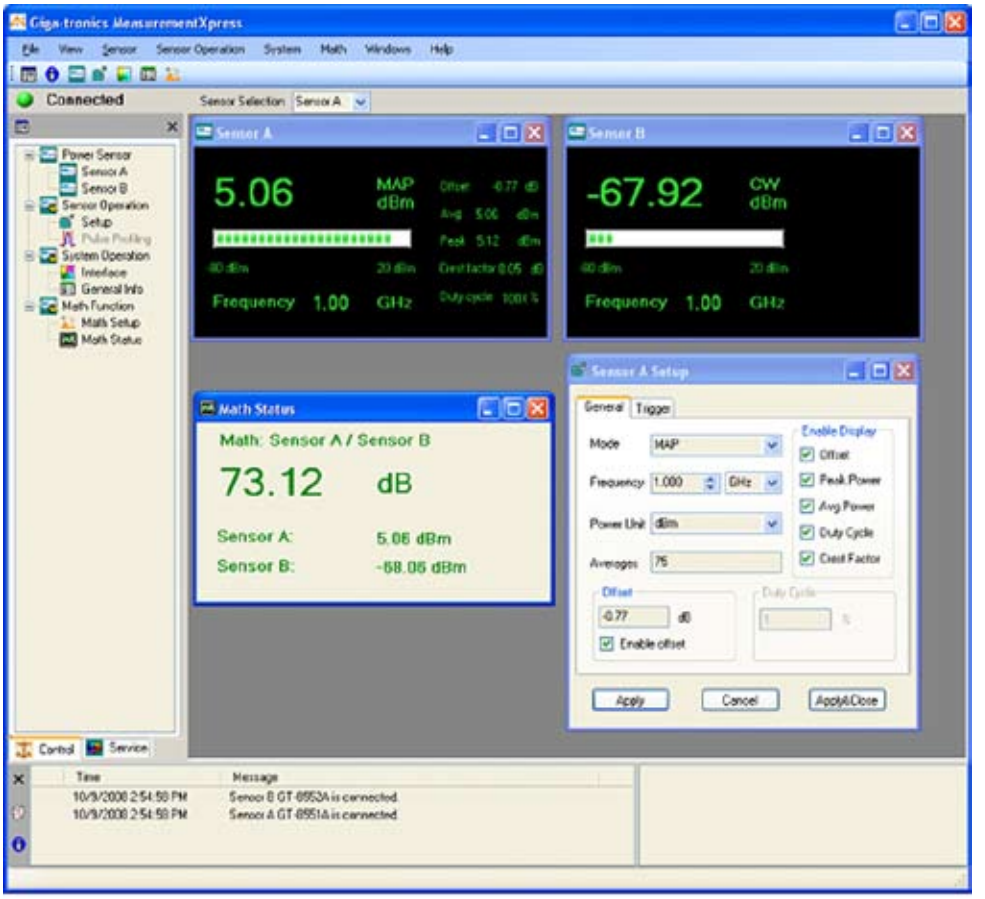
GT-8551A USB Power Sensor
100 MHz to 8 GHz, operational to 10 GHz

PC-based Universal Power Meter

GT-8551A USB Power Sensors

Advanced Power Sensor Technology

- Outstanding accuracy and repeatability
- 2000 readings/sec exceptional speed
- Internal zero and cal – ideal for ATE



The Giga-tronics GT-8550A series USB Power Sensors are designed for fast measurement speed, wide dynamic range and high accuracy. The unique circuit topology is highly reliable, with performance that excels where extremes of measurement speed and accuracy are required. The PC based platform allows for lower cost than traditional power meters and power sensors, and with a laptop PC is ideal for field portable power measurement or remote monitoring applications.

The Giga-tronics GT-8550A series USB Power Sensors include the powerful application software, Measurement Xpress. The Measurement Xpress software provides a suite of measurement capabilities in the familiar, easy-to-use Microsoft® Windows format, and allows for point and click selection of multiple power sensors and displays.

GT-8551A USB Power Sensors

Advanced Power Sensor Technology

The Giga-tronics GT-8550A series USB Power Sensors offer accurate power measurement of RF and microwave signals. Fast measurement speed, wide dynamic range and low VSWR make these broadband power sensors ideal for R&D laboratory, manufacturing test, field installation and field maintenance applications.

The GT-8550A series USB Power Sensors are fully calibrated. Unlike traditional power meters and power sensors, there is no need to cal or zero the sensor prior to making measurements, eliminating sources of error and enhancing ease-of-use. The ruggedized body increases reliability and reduces damage from mishandling.

The Giga-tronics GT-8551A 100 MHz to 8 GHz, operational to 10 GHz, USB Power Sensor can be used in wireless communications and component testing wherever signals with modulation are present. Measurement modes include CW mode, modulated average power, burst average power, pulse average power and crest factor.

The Giga-tronics GT-8552A 100 MHz to 8 GHz, operational to 10 GHz, USB Peak Power Sensor, features pulse profiling for use in measuring pulse parameters for defense and communication applications wherever pulse waveforms are present. The pulse profiling application includes multiple markers and gate functions for accurate pulse characterization. The GT-8552A USB Peak Power Sensor measurement modes include CW mode and modulation modes, as well as the Peak Power Mode.

The Giga-tronics GT-8888A USB Power Sensor with 10 MHz to 8 GHz frequency coverage, operational to 10 GHz, the GT-8553A USB Power Sensor with 10 MHz to 18 GHz frequency range and the GT-8554A USB Power Sensor with 10 MHz to 26.5 GHz frequency range are both optimized for fast, accurate power measurement of continuous wave (CW) RF and microwave signals.

Technical Specifications

Specifications

Specifications apply over 0 ºC to 50 ºC unless otherwise indicated. Typical specifications describe expected but non-warranted performance.

Frequency Range

Sensor Model	Specifications
GT-8551A	100 MHz to 8 GHz, operational to 10 GHz

Dynamic Range

Sensor Model	Specifications	
	100 MHz to 6 GHz	6 GHz to 8 GHz
GT-8551A	-60 dBm to +20 dBm	-50 dBm to +20 dBm

Dynamic Range from 8 GHz to 10 GHz is typically -30 dBm to +20 dBm

Maximum Peak Power (Damage Level)

Sensor Model	Specifications
GT-8551A	+23 dBm (200 mW)

Maximum input power: +20 dBm Maximum input voltage: 25 Vdc

VSWR

Sensor Model	Specifications		
	100 MHz to 250 MHz	250 MHz to 8 GHz	8 GHz to 10 GHz
GT-8551A	1.18:1	1.15:1	1.18:1 typical

Recommended Calibration Cycle

Recommended calibration cycle is one (1) year

Technical Specifications

Accuracy

Measurement uncertainty is computed from the individual cal factor, mismatch, linearity, noise and temperature error factors, and can be computed as either worst case (sum of the applicable error terms) or RSS, representing the most probable error, where RSS is the square root of the sum of the squares of the error terms.

Accuracy is typically < 2% (RSS) mid-band with source VSWR 1.2:1 (or better) at 25 ºC +/- 5 ºC.

GT-8551A Error Factors

Calibration Factor	100 MHz to 0.5 GHz	0.5 GHz to 8 GHz
-60 to +20 dBm	4%	1.7%

Linearity	100 MHz to 2 GHz	2 GHz to 8 GHz
+15 to +20 dBm	7%	5%
+10 to +15 dBm	5%	3%
-60 to +10 dBm	3%	2%

Noise[1]	100 MHz to 6 GHz	6 GHz to 8 GHz
-30 to +20 dBm	0.02%	0.04%
-50 to -30 dBm	0.04%	0.15%
-60 to -50 dBm	0.11%	N/A

Note 1: Noise measured with a 1 second integration time.

Temperature	0 °C to 10 °C	10 °C to 20 °C	20 °C to 30 °C	30 °C to 40 °C	40 °C to 50 °C
-60 to +0 dBm	1%	0.75%	0%	0.75%	1%
0 to +10 dBm	2%	1.75%	0%	1.75%	2%
+10 to +20 dBm	4%	3.75%	0%	3.75%	4%

Zero Offset	100 MHz to 8 GHz
-60 to +20 dBm	0.35 nW typical at 25 °C, 1.7 nW typical 0 °C to 50 °C

Technical Specifications

Measurement Speed

Sensor Model	Specification
GT-8551A	2000 Reading/second typical

Video Bandwidth

Sensor Model	Specification
GT-8551A	10 MHz minimum

Maximum Peak-to-Average Ratio

Sensor Model	Specification
GT-8551A	70 dB typical

General Specifications

USB Voltage	+4.5 Volts to +5.5 Volts
USB Power[2]	450 mA typical, 500 mA maximum
Operating Temperature	0 °C to +50 °C
Storage Temperature	-20 °C to +75 °C
Cooling	Forced air, internal micro-fan
USB Cable Length	15 ft (5 m) maximum
Dimensions (10 GHz)	2” H x 2.5” W x 3” D (50 mm H x 65 mm W x 75 mm D)
Dimensions (18, 26.5 GHz)	2” H x 2.5” W x 3.5” D (50 mm H x 65 mm W x 90 mm D)
Weight	< 1 lbs (< 0.5 kg)
Environmental	MIL-PRF-28800F, Class 3 WEEE compliant, RoHS compliant
Safety	EN 61010 and CE compliant
Emissions	EN 61326 and FCC compliant

Note 2: a USB 2.0 Power Hub is recommended, particularly when using multiple sensors.

Technical Specifications

Trigger Functions

Rate	1 Hz to 750 kHz
Resolution	2 µS
Modes	Single or Continuous
Trigger Source	Internal or External
Internal Trigger Signal Level Range	-20 dBm to +20 dBm (Manual or Auto)
Trigger Input	TTL compatible, Rising or Falling Edge
Trigger Input Operating Levels	0.0 V to 0.8 V (low), 2.0 V to 5.0 V (high), +/- 10 µA
Trigger Input Maximum Levels	-0.5 V (low) to 5.5 V (high)
Trigger-off Time[3]	1 µs minimum

Note 3: If the internal trigger is set to detect the rising edge of a pulse-modulated signal, then the signal pulse-off time must be greater than 1 µs for reliable triggering. If the internal trigger is set to detect the falling edge of a pulse-modulated signal, then the signal pulse-om (or Pulse Width) must be greater 1 µs for reliable triggering.

Technical Specifications

Measurement Xpress

The Giga-tronics GT-8550A series USB Power Sensors are designed for use with a standard PC running Microsoft® Windows. The Giga-tronics GT-8550A series USB Power Sensors include the easy-to-use application software, Measurement Xpress. The Measurement Xpress software provides a suite of measurement capabilities which include remote control and multi-channel power measurements. Features include a graphical user interface (GUI) with easily selectable multi-channel displays.

Modulation Measurements

Modulated Average Power: The Modulated Average Power (MAP) mode is designed to measure the average power of amplitude modulated or pulse modulated RF signals. In MAP mode, the RF power is accumulated over the whole pulsing cycle, and averaged based on the cycle time to give the results.

Burst Average Power: The Burst Average Power (BAP) mode is designed to measure the average power within a burst of pulse. Only power within a pulse will be accumulated and averaged.

Pulse average Power (PAP): is designed to measure the duty cycle corrected pulse power.

Crest Factor: the ratio between the peak power and average power.

Strip Chart Mode: offers multiple sensor graphical display with adjustable rate and duration.

Statistical Chart Mode: offers graphical display of histograms, CDF and CCDF with adjustable rate, duration, range and resolution.

Benefits of Measurement Xpress

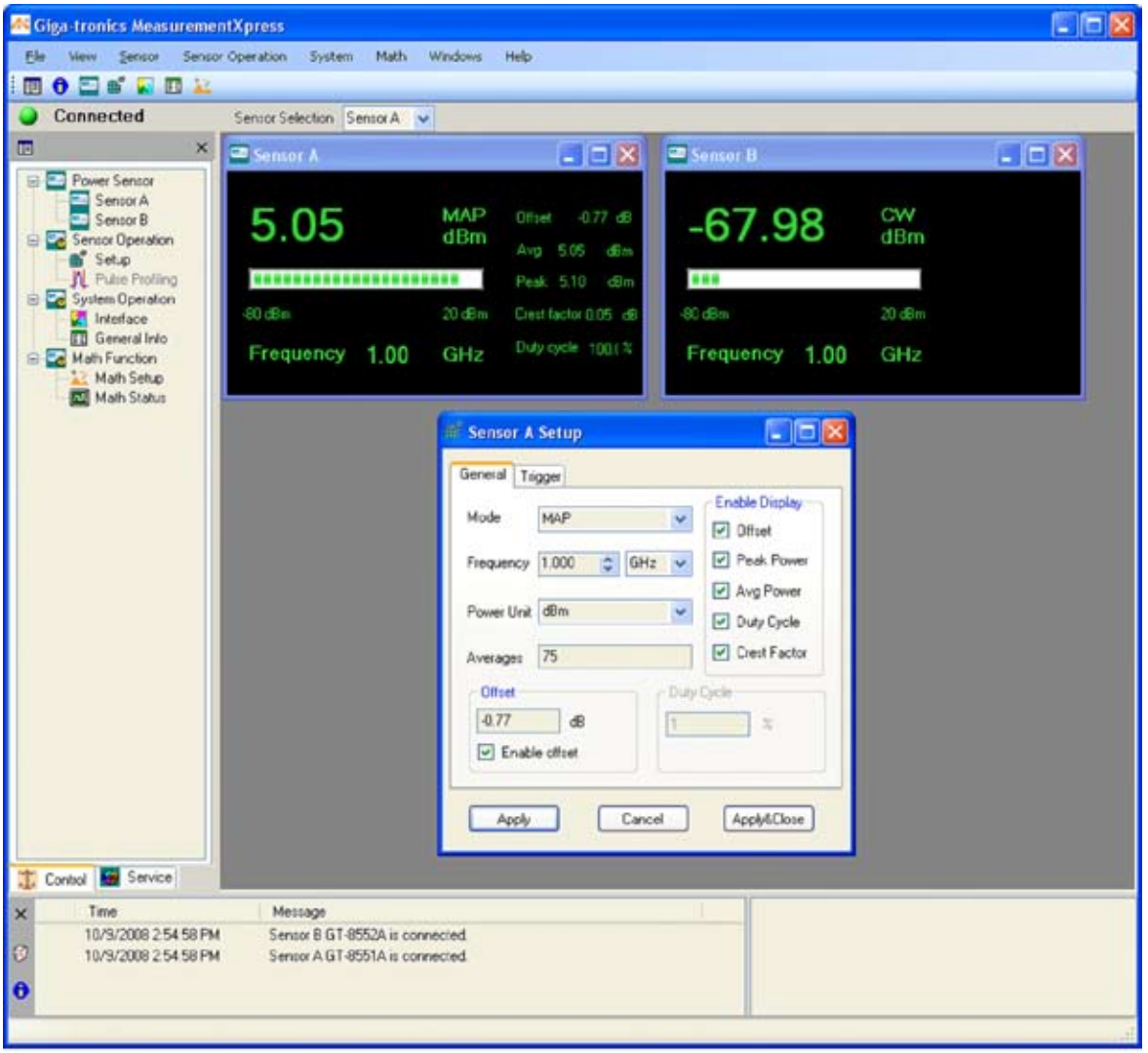
- Familiar Microsoft® Windows Interface
- Easy to read numbers and bar graphs
- Fast update rate allows real time circuit tuning
- Internal zero and cal – powers up ready to measure

Measurement Xpress™

Technical Specifications

Recommended PC Requirements

Parameter	Specification
Operating System	Microsoft® Windows XP, Windows Vista (32) or Windows 7 (32 or 64)
Processor Speed	> 500 MHz
RAM	> 256 MB
Hard Disk Space	> 50 MB
USB Interface	USB 2.0



Technical Specifications

GT-8551A Front Connections

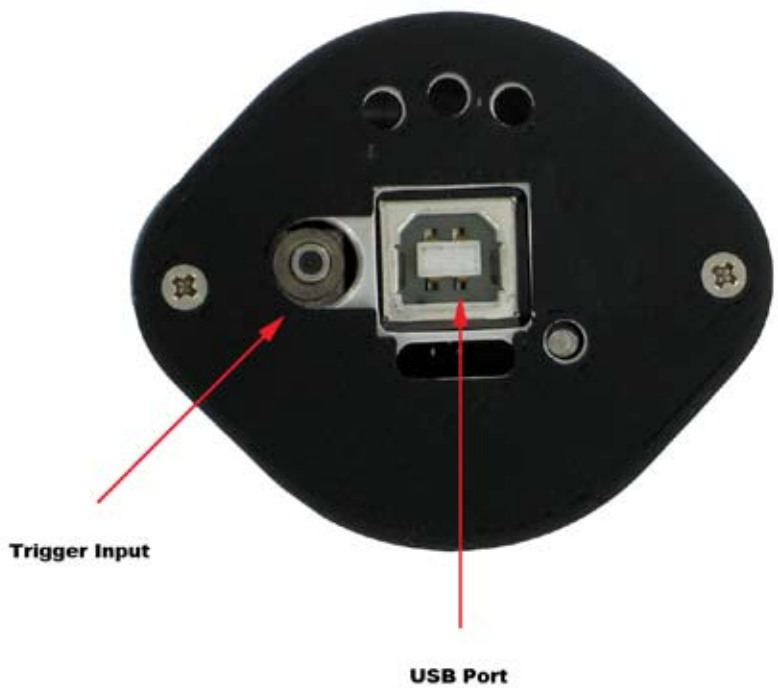
Connection	Description
RF Input	Low VSWR RF input. Type-N (m) connector

GT-8551A Rear Connections

Connection	Description
USB Port	Rugged 4-Pin USB
Trigger Input	SMB (m) snap-on

Items included with the GT-8551A

The GT-8551A USB Power Sensor includes the following: 2 M (6 foot) USB cable; a USB flash drive containing the installation guide, user's manual and the Measurement Xpress software; and a Calibration Certification certificate.



Ordering Information

Giga-tronics has a network of RF and Microwave instrumentation sales engineers and a staff of factory support personnel to help you find the best, most economical instrument for your specific applications. In addition to helping you select the best instrument for your needs, our staff can provide quotations, assist you in placing orders, and do everything necessary to ensure that your business transactions with Giga-tronics are handled efficiently.

Model Number	Description
GT-8551A	USB Power Sensor, 100 MHz to 8 GHz, operational to 10 GHz, CW and Modulation

Available Options and Accessories

Option	Description
01	Add 5 meter (15 foot) extra-long USB cable
05	Soft Carrying Case (Large case for laptop computer and sensors)

P/N 21460-003	SMB (f) snap-on to BNC 2 M (6 foot) cable
P/N JRXC-01300	Type N (f) to SMA (m) Adaptor

Giga-tronics Support Services

At Giga-tronics, we understand the challenges you face. Our support services begin from the moment you call us. We help you achieve both top-line growth and bottom-line efficiencies by working to identify your precise needs and implement smart and result orientated solutions. We believe and commit ourselves in providing you with more than our superior test solutions. For technical support, contact:

Tel: 1-800-726-GIGA (4442) or (925) 328-4669
Email: support@gigatronics.com

Updates

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http://www.gigatronics.com

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