

## Applications

- Threat Signature Characterization
  - Explosives
  - Biologicals
  - Chemicals
- Microwave and THz Spectroscopy
- Materials Characterization

## Features

- Full Turnkey System: Arrives Configured and Ready to Start Making Measurements
- Extremely Economical: A Fraction of the Cost of Previous THz Systems
- Portable: Configurable with Built-in Li Ion Battery with Up to 12 hours of Continuous Use
- Compact: Under 23 cm x 23 cm x 8 cm (9"x 9" x 3") and less than 4 kg (9 lb.)
- Continuous Rapid Scanning From 100 GHz to over 1.8 THz
- Fiber Optic Coupled THz Source and Detector
- Integrated Lock-in Detection
- Room Temperature Solid State Detection: No Cryogenics Required
- Shipped in Custom Travel Case
- OEM version with Quantity Pricing Available

## Compact, Portable Terahertz Spectroscopy System

EMCORE's versatile PB7200 Spectroscopy Platform is designed for scanning complex compounds to precise specifications with greater accuracy and control. The PB7200 is ideal for THz researchers and application developers who need to study the properties of materials at THz frequencies with high-resolution, but who don't want to design and build their own high-resolution THz spectroscopy system. The PB7200 can sweep up to 2.0 THz in a single rapid scan with frequency resolution better than 0.25 GHz.

The PB7200 employs precisely tuned, fiber-coupled butterfly packaged semiconductor DFB lasers, advanced photo-mixing source and detector, and sophisticated digital control hardware and software to provide a fully turnkey laboratory THz spectrometer. The room temperature solid-state homodyne detection technique eliminates the need for cryogenics. The highly efficient CW nature of the photo-mixing source puts all the THz power at the frequency of interest, yielding excellent signal-to-noise ratios across the scan range of up to 70 dB Hz.

Unlike time-domain systems requiring expensive mode-locked lasers, the tunable semiconductor laser diodes in the PB7200 can support linear scans or can 'frequency hop' between frequencies of interest to scan specific regions of the spectrum with varying degrees of resolution. The latest 'snap-in-place' fiber-optically coupled source and detector heads are mounted on a rail system and configured for transmission measurements. They may also be detached from the processor unit and used with extended fiber optic cables for maximum measurement flexibility in a wide range of applications, in either transmission or reflection modes. The new terahertz heads make the PB7200 not only lighter and more compact, but easier to assemble and tear down.

The PB7200's latest software package includes smoothing functions and background subtraction features. The software automatically downloads the calibration files from the PB7200 which makes setting up multiple computers easy.

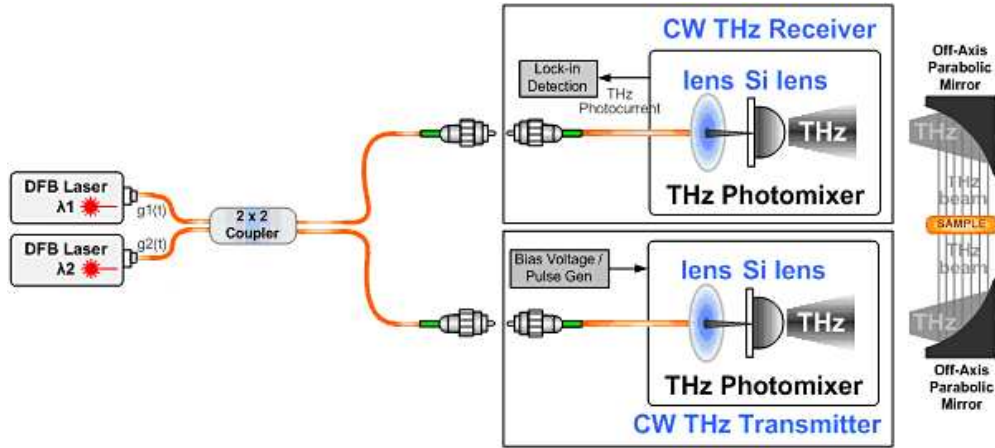
## Models

Model	Description
PB7200-2000-T-I	PB7200 Portable THz Frequency Domain Spectrometer in transmission mode with USB interface, internal lithium ion battery and rail system.
PB7200-D-CCW	Additional detection head with counter-clockwise photomixer required for operating the PB7200 system in reflection mode.

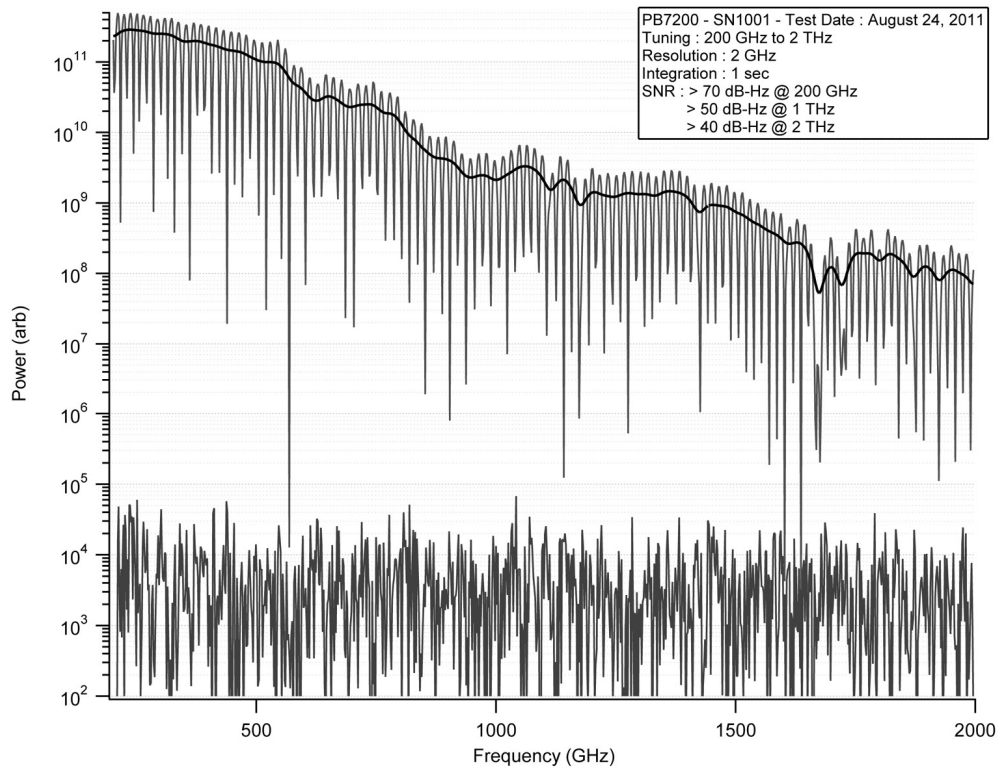
## Performance Highlight

Parameter	Min	Typical	Max	Units
System Bandwidth	1700	1850	2000	GHz
Spectral Purity	0.010	0.015	0.025	GHz
Frequency Resolution	0.100	-	-	GHz
Detector Sensitivity (NEP @ 1000 GHz)	10 <sup>-12</sup>	10 <sup>-11</sup>	10 <sup>-10</sup>	W/Hz
Dynamic Range @ 1000 GHz	40	55	60	dB Hz
Electronic Chopping Frequency	-	6000		Hz

## System Schematic



## Terahertz Performance



Typical performance of a PB7200-2000 - THz Spectrometer for a scan of laboratory air at 1 ATM.

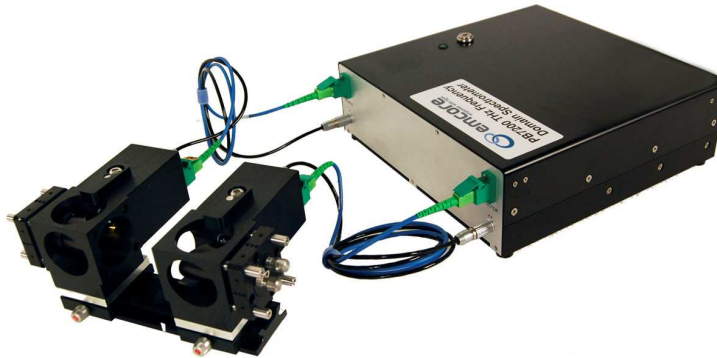
Gray line: raw data, Black line: 60 point average

\*Individual unit performance may vary and may be priced accordingly.

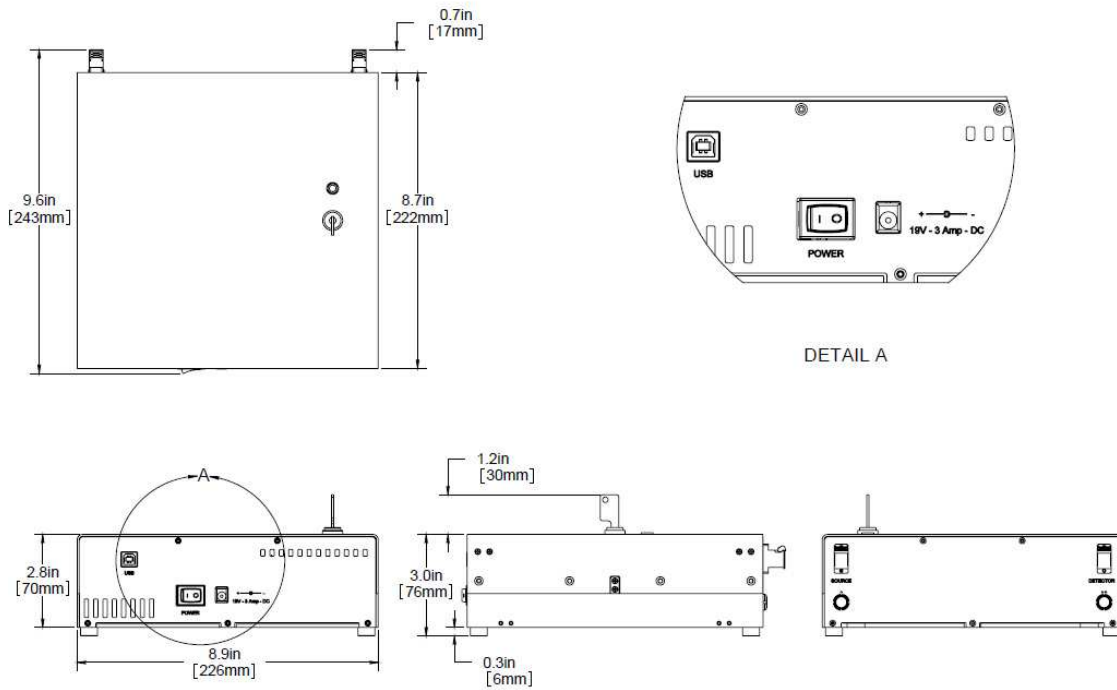
# PB7200 Portable Frequency Domain Terahertz Spectrometer

DATASHEET | AUGUST 2013

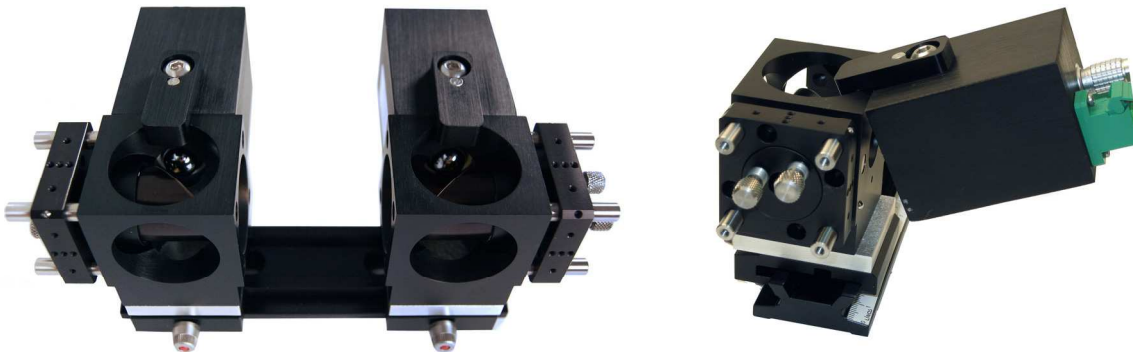
TERAHERTZ SYSTEMS



## Terahertz Control Unit



## Terahertz Optics



## Specifications

Parameter	Value
Weight – Control Chassis	2.5 kg
Weight – Rail system with Heads and Optics	1.1 kg
Operating Temperature	-20C to +55C
Storage Temperature	-20C to +75C
Humidity	10% to 90% (non-condensing)
Input Voltage	100 – 240 VAC
Input Frequency	50 - 60 Hz
AC Input Load @ 120 vac @ 25 C	1.5 Amps
AC Input Load @ 240 vac @ 25 C	0.75 Amps
DC Output Load @ 19 vdc @ 25 C (average)	250 mA
Runtime on Internal Battery (estimated)	12 hours

## Regional Contact Information

U.S. East	U.S. West	Japan	China
Steve Moloy EOX E: <a href="mailto:stevem@eoxsales.com">stevem@eoxsales.com</a> P: +1 410-334-3973 <a href="http://www.eoxsales.com">http://www.eoxsales.com</a>	Kirk Reger Ward/Davis E: <a href="mailto:kreger@warddavis.com">kreger@warddavis.com</a> P: +1 310-643-6977 <a href="http://www.warddavis.com">http://www.warddavis.com</a>	Mr. Daisuke Yamashita E: <a href="mailto:yamashita@mrf.co.jp">yamashita@mrf.co.jp</a> P: +81 03-5821-3623 <a href="http://www.mrf.co.jp">http://www.mrf.co.jp</a>	Andrew Qiu E: <a href="mailto:Andrew.Qiu@Emcore.com">Andrew.Qiu@Emcore.com</a> P: +86 13-828737578 <a href="http://www.emcore.com">http://www.emcore.com</a>
United Kingdom and Europe	Central Europe and Benelux	India	Australia
Davinder Basuita E: <a href="mailto:davinder_basuita@emcore.com">davinder_basuita@emcore.com</a> P: +44 1344-827-306 <a href="http://www.emcore.com">http://www.emcore.com</a>	Mr. Harald Sittenauer E: <a href="mailto:hsittenauer@eqphotonics.de">hsittenauer@eqphotonics.de</a> P: +49 89-319019 22 <a href="http://www.eqphotonics.de">http://www.eqphotonics.de</a>	Davinder Basuita E: <a href="mailto:davinder_basuita@emcore.com">davinder_basuita@emcore.com</a> P: +44 1344-827-306 <a href="http://www.emcore.com">http://www.emcore.com</a>	Dr. Joseph R. Demers E: <a href="mailto:joe_demers@emcore.com">joe_demers@emcore.com</a> P: +1 626-293-3659 <a href="http://www.emcore.com">http://www.emcore.com</a>