THZ-B

THZ-B detectors and T-Rad modules

T-Rad Module

KEY FEATURES

COVERS THE ENTIRE THZ SPECTRUM
Get the best precision across the entire wavelength range and relative measurements from 30 THz to 0.1 THz.

ROOM TEMPERATURE OPERATION
Easier to use and less expensive than a Golay cell.

MEASURE POWER FROM NW TO MW
With state of the art pyroelectric sensors, measure down to 100 nW with 5 nW NEP

USE WITH T-RAD THZ MODULE OR T-RAD-ANALOG POWER MODULE
Each head can be connected to an oscilloscope using the analog power module (T-Rad-Analog) or directly to a PC with the digital power module (T-Rad)

SEVERAL SENSOR SIZES AVAILABLE
Choice of 5 mm and 9 mm diameter

CALIBRATED AT 0.63 µM
All THz detectors are calibrated at a single wavelength (0.63 µm) and include a typical wavelength correction data from 0.25 to 440 µm. They are used for relative measurements outside that range.

SDC-500 OPTICAL CHOPPER
All THZ-B detectors require the use of an optical chopper, like our SDC-500, to sync the signal at either 5 Hz (DA models) or 25 Hz (DZ models)

OUTPUT OPTIONS

SMART DB15 CONNECTOR
Contains all the calibration data

TWO DETECTOR TYPES AVAILABLE:

- "DZ": digital output, used with T-RAD digital power module
- "DA": analog output, used with T-RAD-ANALOG analog power module

COMPATIBLE DISPLAYS & PC INTERFACES

T-RAD
(for "-DZ" models only)

T-RAD-ANALOG
(for "-DA" models only)

ACCESSORIES

Stand with delrin post

Removable IR windows
(Various types available)

SDC-500 digital
optical chopper

Winston cone

Pelican carrying case

THZ-B
Specifications

*Also traceable to NRC-CNRC




	THZ5B-BL-DZ	THZ5B-BL-DA	THZ9B-BL-DZ	THZ9B-BL-DA
MAX AVERAGE POWER	20 mW	43 µW	20 mW	150 µW
EFFECTIVE APERTURE	5 mm Ø	5 mm Ø	9 mm Ø	9 mm Ø
COMPATIBLE MODULES	T-Rad	T-RAD-ANALOG	T-Rad	T-RAD-ANALOG
MEASUREMENT CAPABILITY				
Spectral range [a]				
Frequency	0.1 - 30 THz	0.1 - 30 THz	0.1 - 30 THz	0.1 - 30 THz
Wavelength	3000 - 10 µm	3000 - 10 µm	3000 - 10 µm	3000 - 10 µm
Max measurable power	20 mW	43 µW	20 mW	150 µW
Noise equivalent power (NEP)	5 nW	1.0 x 10^{-9} W/(Hz)^{½}	50 nW	3.0 x 10^{-9} W/(Hz)^{½}
Rise time (0-95%)	≤ 0.2s	≤ 0.2s	≤ 0.2s	≤ 0.2s
Sensitivity (Typical)	N/A	70 kV/W	N/A	20 kV/W
Chopping frequency [b]	25 Hz	5 Hz	25 Hz	5 Hz
DAMAGE THRESHOLDS				
Max average power density (at 1064 nm)	10 mW/cm²	10 mW/cm²	10 mW/cm²	10 mW/cm²
PHYSICAL CHARACTERISTICS				
Effective aperture	5 mm Ø	5 mm Ø	9 mm Ø	9 mm Ø
Sensor	Pyroelectric	Pyroelectric	Pyroelectric	Pyroelectric
Absorber	BL	BL	BL	BL
Dimensions	66.0Ø x 46.5D mm	66.0Ø x 46.5D mm	66.0Ø x 46.5D mm	66.0Ø x 46.5D mm
Weight	227 g	227 g	227 g	227 g
ORDERING INFORMATION				
Compatible stand	STAND-D-233	STAND-D-233	STAND-D-233	STAND-D-233
Product page				

a. Projected spectral range.
From 10 to 440 µm, spectrometer measurement.
From 440 to 3000 µm, relative measurement only.
This spectral range is subject to change.
b. SDC-500 digital optical chopper sold separately.

THZ-B
Specifications

T-Rad

The T-Rad is a microprocessor-based digital radiometer that includes a 12-bit ADC and unique DSP Lock-In Software. It is powered by a USB connection, which also acts as a Virtual COM port. When a THZ-B Terahertz Pyroelectric detector is plugged into the T-Rad module, the module reads the content of the head's EEPROM, which identifies the detector and provides calibration and wavelength correction data. The LabVIEW Software supplied with the device makes it very easy to set up the radiometer, measure a THz or broadband source and record data. The software is compatible with Windows 7, 8 & 10.

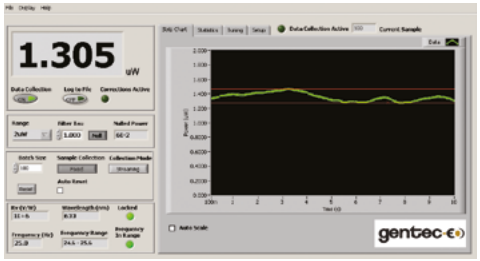
T-Rad
(rear view)

T-Rad-Analog
(front view)

SPECIFICATIONS & FEATURES

	T-RAD	T-RAD-ANALOG
Compatible detector heads	THZ-B-DZ	THZ-B-DA
Full scale ranges	200 nW - 200 mW*	N/A
Power on light	Green	Green
Analog output	0 to 3.6V, BNC	± 4.88 V, BNC
PC connection	USB 2.0	None
Trigger input (TTL)	BNC connector	None
Power supply	USB 2.0	External, 100/240 VAC 50 - 60 Hz, and 9V battery (both included)
Product number	201849	202306

** Actual ranges vary based on the THZ-B detector selected*



INSTRUMENT CONTROL AND STRIP CHART

Instrument controls and the radiant power measurement are always visible, making it easy to change the radiometer settings, no matter which display tab is selected. Instrument controls include: Range, Filter Tau, Batch Size, Data Collection Mode, Reset Options, and a Null button for background cancellation. In addition, there are more set up and operation status indicators including: detector Rv, Wavelength, Frequency (actual), Locked and Frequency in Range lights. The Strip Chart displays the Radiant Power measurement in Watts, either continuously or by the batch. Select full scale, auto scale or use our manual scaling option.

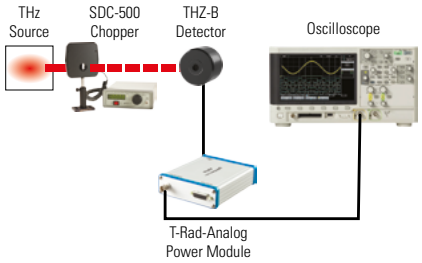
INSTRUMENT CONTROL AND TUNING NEEDLE

The "TUNE" tab selects the very useful "Tuning Needle" display. This is a simulated analog meter whose speed is determined by the "filter tau" setting. It is expected to be used during the set-up of a radiometer with a source. The "tau" value is usually set to a small value when aligning the probe to the source (i.e. when peaking the reading). There is a button control to select "full scale", "min-max" or "reset". In the "min-max" mode, the indicators are "blue" for the minimum power and "red" for the maximum power.

THZ-B
Specifications

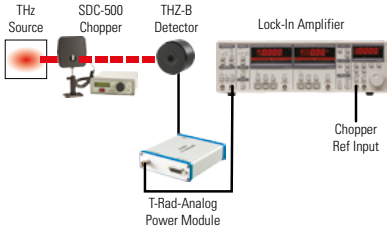
INSTRUMENT CONTROL AND STATISTICS

In the "Statistics" tab there are 4 large windows that contain the statistics for the selected batch, including: Minimum, Maximum, Standard Deviation and Mean, expressed in Engineering Notation. Standard Deviation can be displayed in Watts or as a % that is user-selectable. There is also a window that shows the bandwidth of the Digital Band Pass Filter based on the user selected "Filter Tau" (0.100 to 100 seconds). A lower time constant is helpful when setting up, and a longer one when making measurements, especially on the lower ranges of the instrument.



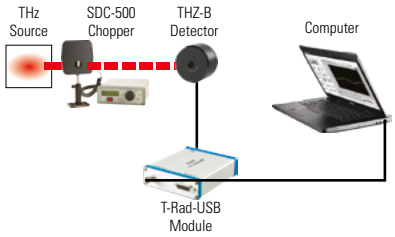
THZ-B-DA DETECTOR AND OSCILLOSCOPE

Here is a basic analog set up that would be useful if the optical power of the source was about 5 µW or greater. The output of the THZ5B-BL-DA detector would be approximately 600 mV at 5 Hz chopping frequency, giving plenty of signal for an oscilloscope. Simply read the voltage output and divide by the Rv factor (V/W) of the detector to measure the intensity of the source in Watts. Also consider applying a wavelength correction factor under certain circumstances.



THZ-B-DA DETECTOR AND LOCK-IN AMPLIFIER

This is another analog set-up option that we recommend if you have to measure very low power levels (i.e. less than 5 µW) where the signal may be buried in the broadband noise. The voltage output of the analog THZ-B-DA detector, powered by our T-Rad-Analog, is routed to the Lock-In Amplifier input, and the Sync Output of our SDC-500 Chopper is connected to the reference input. The Lock-In Amplifier will lock on the chopping frequency and you can dial in a long integrating time and measure a very low RMS voltage. The voltage divided by our Voltage Responsivity (V/W) equals the power of the source.



THZ-B-DZ DETECTOR AND T-Rad MODULE

Although analog solutions are available, for simplicity, convenience and sensitivity, we recommend you choose our THZ-B-DZ detectors and the T-Rad Digital Radiometer. Our unique DSP Lock-In Amplifier software provides a function much like the Analog Lock-In, but is so much easier to use. It also addresses thermal drift of the sensor and allows you to display the power measurement and complete statistics directly in digital and graphic formats. Set the range, null the background, set the filter tau (bandwidth) and make the measurement. It's that easy!

Specifications are subject to change without notice
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