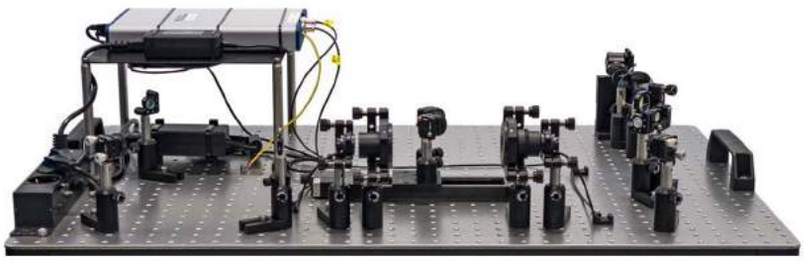
New Age Instruments & Materials Pvt. Ltd.

THz Time Domain Spectrometer



All TDS systems share some common parameters that are listed in this paragraph. For the spectral bandwidth and the dynamic range please see the subsequent sections.

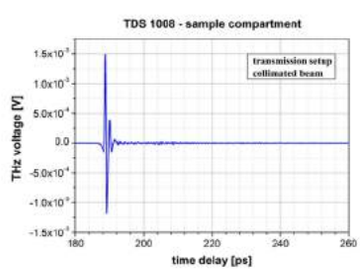
- Maximum scan rage : 650 ps
- Spectral resolution : < 2 GHz
- THz beam diameter : collimated: 22 mm
- Focused : ~ 1 mm @ 1 THz
- Sample size : collimated: 30 mm x 30 mm
- Focused : 10 mm x 10 mm
- Supply voltage : 110 .. 240 VAC, 50 – 60 Hz
- Dimensions : 60 cm x 60 cm x 30 cm or 90 cm x 60 cm x 30 cm
- Weight : 60 – 100 kg, depending on chosen configuration

N-TERA 780

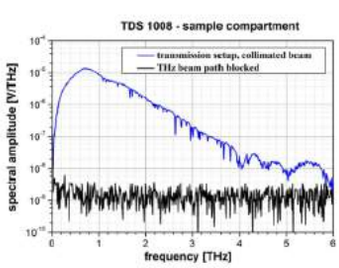
A TDS1008 THz spectrometer contains a femtosecond pulse laser with a wavelength of 780 nm and pulse duration ~ 100 fs. This laser in combination with high performance photo conductive antennas allows a large spectral bandwidth and a high dynamic range.

The TDS1008 parameters inside the sample compartment are:

- spectral bandwidth : 0.05 – 4.0 THz
- dynamic range : ≥ 85 dB



THz pulse for the sample compartment, nitrogenpurge applied.



THz spectrum for the internal antennas with small absorption bands due to the air humidity.

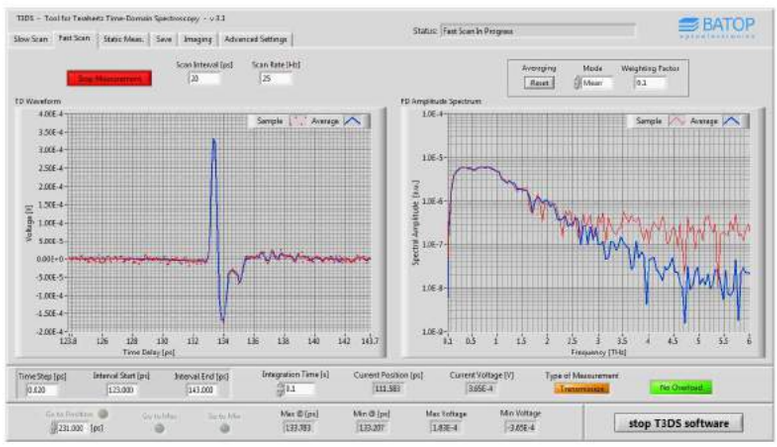
12-15, IInd Floor, Apna Enclave, Railway Road, Gurgaon, Haryana-122001, India
Phone No.: +91 124 4086513 | sales@newagein.com | website: www.newagein.com

Additionally, the TDS system can be ordered with fiber coupled antennas that enable measurements on larger objects with more flexibility outside the spectrometer housing.

Option FSU – Fast Scan Unit

In order to have a live picture of the THz pulse you may want to order the fast scan unit. This hardware option gives you the possibility to optimize the THz signal within a very short amount of time which is typically needed if you change the measurement setup very often (transmission / reflection / ATR or adding / removing the focusing TPX lenses). The fast scan unit uses a voice coil that oscillates in order to scan a short time interval with a frequency of a few hertz. During the adjustment procedure the software displays a live picture of the THz pulse and the corresponding spectrum.

The voice coil allows scanning an interval of up to 40 ps with a frequency of 5 Hz. But you can also scan with a frequency of 100 Hz if an interval of 5 ps works for you. Please note that because of the limited time interval and the very rapid data acquisition this option is not meant for material analysis but only for signal optimization.



New Age Instruments & Materials Pvt. Ltd.

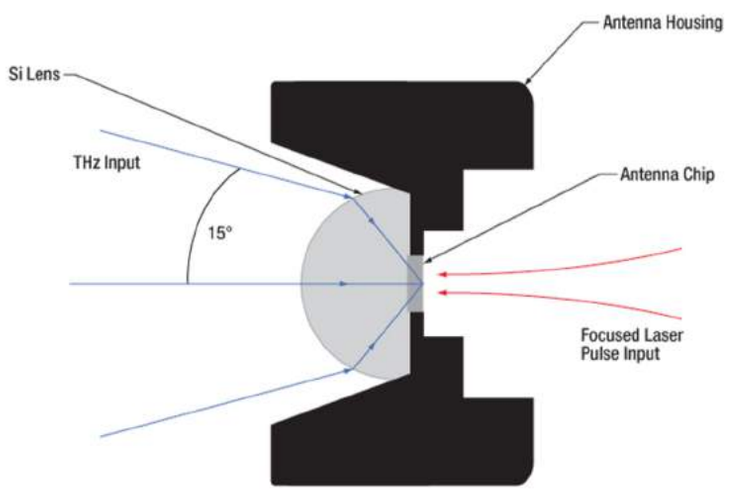
Test Setup for PCA based THz Transmitter and Receiver

Lens mount with suitable lens to focus laser beam to 10um spot size
Suitable arrangement to hold HRFZ silicon lens for focusing THZ to PCA

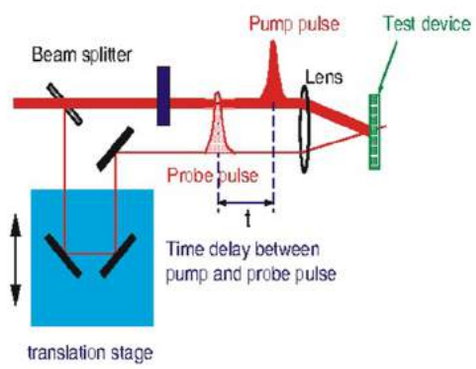
HRFZ Si Lens Specifications:

- Clear Aperture : >90% of Diameter
- Surface Quality : 80-50 Scratch-Dig
- Radius of curvature : 6.0 mm

Suitable arrangement for X-Y movement of sample mounted on sample holder
Suitable sample holder (2" x 2") with probe tips for contacting device electrodes
NIR camera of resolution > 1 megapixel with Accessories for observing laser spot.



Optical Pump-probe Set up



12-15, IInd Floor, Apna Enclave, Railway Road, Gurgaon, Haryana-122001, India
Phone No.: +91 124 4086513 | sales@newagein.com | website: www.newagein.com

Optical pump probe setup shall comprise of:

1. Optical breadboard 24" x 18" for mounting components

2. Beam splitter for 100 mWatt 780 nm laser. Beam splitting ratios are (i) 90:10 (ii) 99:1 (note either of one beam splitter will be used at a time)

- Type: Non-polarizing cube beam splitters (700-1100 nm)
- Beam-splitter coating 700-1100nm
- AR Coating: Input and output faces
- Surface flatness: Lambda/10
- Wavefront error (wavefront distortion): <Lambda/4
- Transmitted beam deviation < 5 arcmin

3. Arrangement for movement and alignment of pump-beam-spot with respect to stationary probe-beam-spot by mirrors (tip-tilt) so that both beam strike at same spot on sample. Lens arrangement for focusing pump & probe beam with spot dia. < 100 µm.

4. NIR power meter comprising of suitable sensor/detector and with compatible console

Sensor/Detector

Detector Type : Silicon Photodiode

- Wavelength Range : 400-1100nm
- Optical Power Working Range : 500nW-500 mW
- Max Average Power Density: 20 W/cm2
- Max Pulse Energy : 20 µJ
- Active Detector Area : Approx. 9.7 mm x 9.7 mm

Display Unit

•Detector Compatibilty : Photo diode sensors and other detectors

• Connector Units : DB9F, left side

• Measurement Ranges : 6 decades (50 nA to 5 mA Range) in W or A

• Display Resolution :1 pA/responsivity value (A/W)

•Bandwidth : DC-100 kHz

5. Suitable sample mounting arrangement for convenient sample replacement
6. Motorised time delay unit> 10 cm. It should be operated by the controller of THz spectrometer.
7. NIR camera of resolution > 1 megapixel with camera-optics (long working distance> 1") for observing laser spot