

Terahertz Registration System TRS-16

Advanced electronics used in T-SPEC and T-FIBER terahertz spectrometers is also available as stand-alone product named TRS-16. It can be used for home-made opto-electronic or electro-optic pulsed THz spectroscopy systems. The complete set includes electronics module and fast scan delay line based on voice coil, with possibility to connect second slow delay line based on stepper motor. It also includes powerful software package used for system control and data acquisition. Similar version of dedicated software is also used in all TERA-VIL terahertz spectrometers.

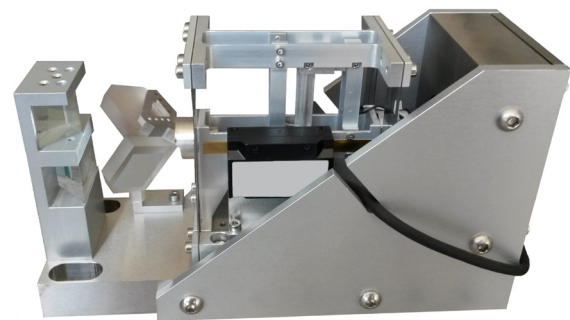
ELECTRONICS

The electronic module of TRS-16 system consists of two main parts: delay lines control and signal registration. Fast delay line based on voice coil allows real time data acquisition at 10 scans/s rate with 116 ps scanning window. Use of the optical linear encoder ensures the extremely low jitter, thus registration system can achieve high dynamic range up to 90 dB. The registration part has embedded 16 bit analog to digital converter, operational preamplifier and the THz emitter bias modulator. TRS-16 system also provides bias for the photoconductive THz emitter in range from 10 to 95 V DC and for the operational preamplifier ± 12 V DC. Operational preamplifier is also included into the kit.



MECHANICS

The fast scan delay line is designed without bearings and uses a magnetically coupled drive which makes it extremely reliable and significantly extends the lifetime. A special mechanical design makes movement of retroreflector straight along one axis, which results perfect beam pointing of the beam passing through the delay line. The maximum line scanning rate is matched with its resonance frequency. This feature substantially reduces energy consumption, vibrations and heat generation.



SPECIFICATIONS

Analog to digital converter	16 bit
Detector antenna preamplifier gain	40 dB up to 300 kHz
Dimensions (L×W×H)	230 × 170 × 55 mm

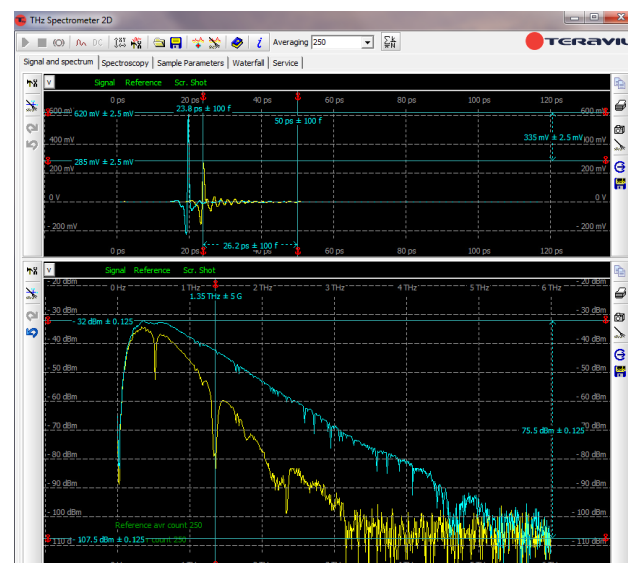
SPECIFICATIONS

Maximum scan window	116 ps
Speed (at max scan window)	10 Hz
Dimensions (L×W×H)	214 × 75 × 120 mm

SOFTWARE

The Terahertz Registration System TRS-16 comes with dedicated software capable to:

- ▶ register THz signal, get FFT spectrum, absorbance and transmittance in real time (10 scans/s);
- ▶ make a raster scan image using standard stepper motor XY stage;
- ▶ find the absorption, transmission and thickness of the sample;
- ▶ THz signal continuous data-flow recording;
- ▶ find complex index of refraction, complex conductivity and complex dielectric constant;
- ▶ register optical pump THz probe signal.



THz signal and it FFT spectrum of "Xanax" in nitrogen environment