

# Fiber-Coupled Measurement Kit for Terahertz Research and Education

Kit includes femto-second fiber laser, all optical, and electronic components

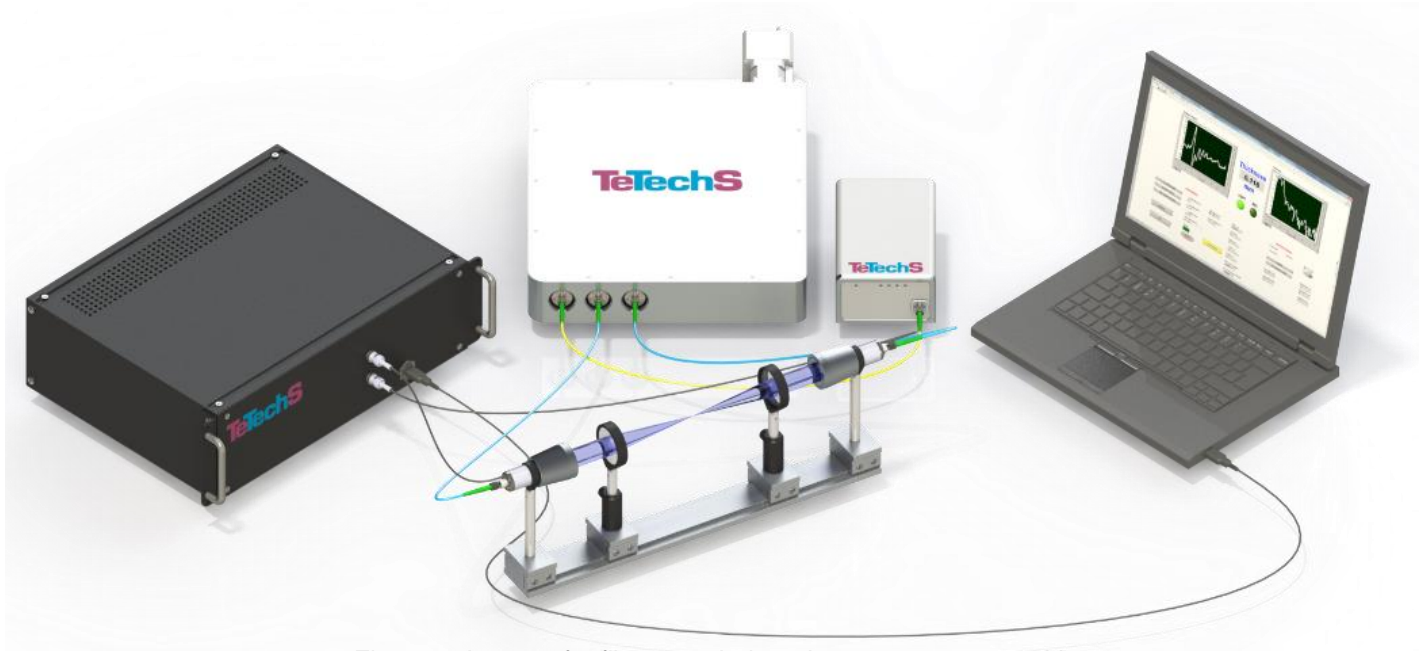


Figure 1: Image of a fiber-coupled terahertz measurement kit

## Key Features of the Measurement Kit

- ✓ Terahertz time-domain measurement
- ✓ Eye safe laser operation (fiber-coupled laser light)
- ✓ Electric field amplitude and phase measurement
- ✓ Field and wave propagation demonstration
- ✓ Quasi-optical measurement demonstration
- ✓ Terahertz imaging upgradable module
- ✓ Fast scan upgradable module (10 measurement/s)
- ✓ Flexible and quick to set up (plug and play in 20 min)
- ✓ Friendly user interface LabView software
- ✓ LabView code adaptable (write your own UI code)
- ✓ Terahertz Imaging XYZ Raster Scan Hardware with Image Data Acquisition Software
- ✓ Dry air purge box option

## System Specifications

Excitation Laser	1550 nm, 120 mW, 120 fs
Measurement Modalities	Transmission & Reflection
Transmitter Module	T-Era-100A-1550-fiber
Receiver Module	T-Era-20D40P-1550-fiber
Average Optical Power on Transmitter	15 mW
Average Optical Power on Receiver	15 mW
Terahertz Spectrum Bandwidth	>4 THz
Power Spectrum Dynamic Range	>70 dB
Scan Time (slow scan)	2-5 min (slow), 0.1-1 sec (fast)



Figure 2. TeTechS patented fiber-coupled terahertz photoconductive antenna

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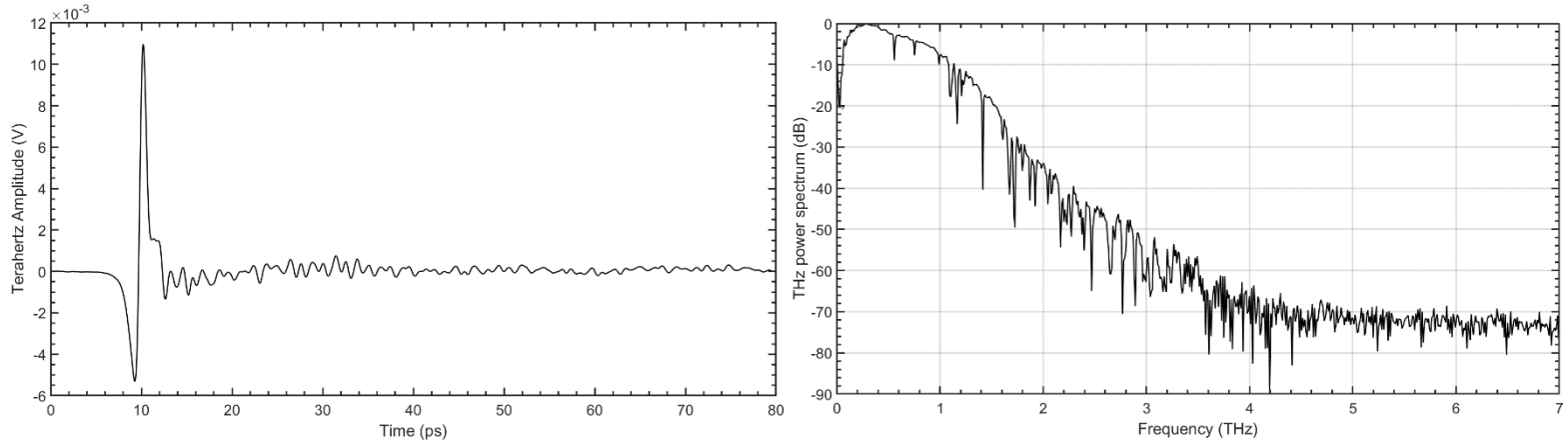


Figure 3. Example of a measured terahertz pulse and its corresponding power spectrum with the fiber-coupled measurement kit

TeTechS fiber-coupled terahertz measurement kit is used in advanced optics labs of universities and colleges for terahertz research and to demonstrate terahertz and optical measurements to students. The highest quality components are selected for advanced scientific measurements designed for research and educational purposes. The kit is comprised of components that have been uniquely packaged to meet the needs of educators. Students will have hands-on experience and direct observation of terahertz fields and waves propagating in free-space. Students can run experiments with terahertz waves interacting with different materials and record both amplitude and phase of electric fields in time-domain (Figure 3). The user interface software calculates the frequency spectrum of the measured signal to show the absorption properties of the sample under test in frequency domain, an example shown in the figure 4.

TeTechS' Fiber-coupled T-Era series terahertz photoconductive antennas are used to generate and detect electromagnetic waves at the terahertz frequencies to be used for industrial and scientific applications. The antenna chip dyes are made on novel semiconductor material systems and are packaged inside patented fiber-coupled enclosure designs, making the antennas superior in performance and easy to use.

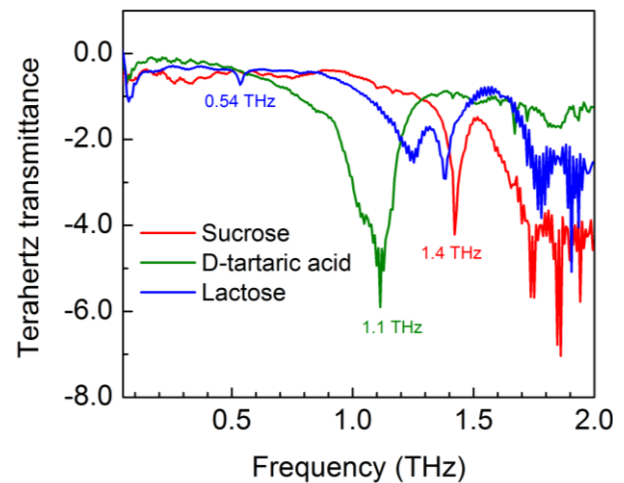


Figure 4. Example of a spectroscopy measurement of organic powders with the measurement kit

## Fiber-Coupled Kit Components

- 1550 nm, 120 fs, 120 mW Short Pulse Fiber Laser ✓
- Transmitter Photoconductive Antenna Package ✓
- Receiver Photoconductive Antenna Package ✓
- Optical Power Distributor and Scanning Chassis ✓
- Terahertz Focusing Lens ✓
- Lock-in Amplifier ✓
- Low-Noise Current Amplifier ✓
- Square-wave Signal Generator ✓
- Optical Fiber Cable ✓
- MMCX/MMCX Cable ✓
- Railing Package and Mount ✓
- Laptop Computer with User Interface Software ✓
- Control Box ✓
- Terahertz Imaging XYZ Raster Scan Hardware with Image Data Acquisition Software ✓