

# TeraSmart

## Compact Industry-Proven THz-TDS System

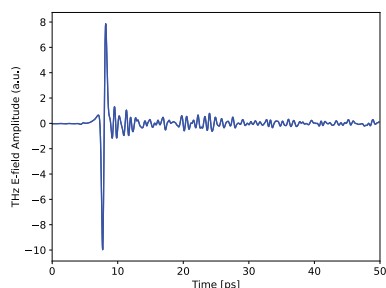


The new compact terahertz spectrometer TeraSmart integrates the latest achievements in broadband Terahertz Time Domain Spectroscopy (THz-TDS) into an easy-to-use turnkey solution. It combines Menlo Systems' latest fiber-based femtosecond laser sources featuring our figure 9<sup>®</sup> mode locking technology and our industry-proven THz components. The modular design based on our OEM laser platform ELMO ensures a flexible configuration of the system to meet the needs for integration in any industrial or scientific environment. Custom fiber lengths to THz emitter and THz detector are available upon request. Moreover, multibranch configurations are possible, enabling simultaneous measurements of several emitter/detector pairs using only one fs fiber laser oscillator.

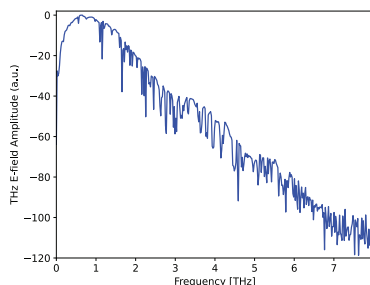
Rounding off the product, a smart TCP socket interface allows platform-independent remote control over ethernet connections for seamless integration in existing experiments or in industrial nondestructive testing (NDT) environments. In short: A turnkey, OEM integrable THz spectrometer engineered for 24/7 operation.

### PERFORMANCE DATA

THz pulse measured in ambient air\*



THz spectrum showing absorption lines of atmospheric water vapor



|                                    |          |              |
|------------------------------------|----------|--------------|
| <b>THz Bandwidth</b>               | >4.5 THz | in 0.04 sec. |
|                                    | >6 THz   | in <5 sec.   |
| <b>Dynamic Range</b><br>(Spectrum) | >60 dB   | in 0.04 sec. |
|                                    | >80 dB   | in <5 sec.   |
|                                    | >95 dB   | in <60 sec.  |
|                                    | >100 dB  | in <300 sec. |

\*Settings: 50 ps scan window measured at 24 Hz scan speed to achieve >6 THz and >95 dB in <60 sec. Measured in transmission with our off axis parabolic mirrors THz optics according to the VDI/VDE 5590 standard Terahertz systems - Time domain spectroscopy (TDS) systems.

## MenloSystems

### HIGHLIGHTS

- All-Integrated Turnkey System
- Compact 19" Rack Solution
- Industry-Proven Delay Unit
- Industry-Proven fs Fiber Laser
- figure 9<sup>®</sup> Mode Locking
- Multi-Channel Option
- All-Fiber Flexibility
- Ethernet Based Remote Control Engine
- Class 1 Laser Product

### KEY SPECIFICATIONS

- >6 THz Bandwidth
- >100 dB Dynamic Range
- Large Scan Range >850 ps, Flexible Setting of Range and Speed
- High Spectral Resolution <1.2 GHz

### APPLICATIONS

- Inline Thickness Measurements
- Time Resolved THz Spectroscopy
- Material Characterization
- Non-Destructive Testing (NDT)
- Pharmaceutical Monitoring

### FEATURES

- Turnkey Operation
- Broadband Application
- Transmission & Reflection Geometry
- Fiber Coupled THz Antennas for Arrangement Outside the Spectrometer Housing
- Real-Time Measurements
- OEM Integration-Capable
- Modular Platform

### OPTIONS

- **Dual-Detection/Multi-Channel**
- **TERA Image**  
Hyperspectral Imaging & Analysis Platform
- **Reflection Head**  
Compact Sensor Unit with Integrated THz optics
- **THz Purge Box**  
Enables Water Line Free THz Spectroscopy
- **TeraLyzer**  
Advanced Software for THz Data Analysis
- **Polymer Lens Optics**
- **Custom Fiber Length**
- **THz Path Length Adaptation**  
>3 m on request

## Compact Industry-Proven THz-TDS System

### THZ SPECIFICATIONS

|                              |   |
|------------------------------|---|
| Spectral Range               | >6 THz  |
| Dynamic Range                | >100 dB   |
| Total Scan Range             | >850 ps, flexible scan range and speed, customizable THz path length >3 m       |
| THz Frequency Resolution     | <1.2 GHz  |
| Laser Output Ports for THz*  | 2 fiber-coupled ports, 1560 nm, FC/APC, PM fiber, <90 fs after 2.5 m patch cord |
| Laser System Repetition Rate | 100 MHz   |

\*Allows for optional multichannel extension (up to 4 laser ports).

### SYSTEM DIMENSIONS AND WEIGHT

|                                |  |
|--------------------------------|--|
| Enclosure                      | 19" x 3U (448 x 132 x 495 mm <sup>3</sup> ), 18 kg |
| Optics, Monitor and Accesories | 12 kg  |

### SYSTEM COMPONENTS

|                     |  |                                    |
|---------------------|--|------------------------------------|
| Optical Components  | Integrated femtosecond laser source ELMO**                           |                                    |
|                     | Integrated fiber-coupled optomechanical delay line                   |                                    |
|                     | External fiber-coupled THz emitter and receiver modules TERA15-FC**  |                                    |
|                     | Compact THz optics with parabolic mirrors                            |                                    |
| Control Electronics | Transimpedance amplifier   |                                    |
|                     | Integrated PC and software package for measurement and data analysis |                                    |
|                     | 22" screen, keyboard and mouse                                       |                                    |
|                     | TCP Socket remote control interface                                  |                                    |
|                     | .NET remote control interface  | external analog/digital triggering |

\*\*See product data sheet for detailed specifications

### REQUIREMENTS

|                       |                              |
|-----------------------|------------------------------|
| Operating Voltage     | 100/115/230 VAC              |
| Frequency             | 50 to 60 Hz                  |
| Power Consumption     | <200 W                       |
| Cooling Requirements  | No water-cooling is required |
| Operating Temperature | 15-35°C                      |
| Storage Temperature   | 0-40°C                       |
| Humidity              | 80% RH noncondensing         |

### ORDERING INFORMATION

|              |           |
|--------------|-----------|
| Product Code | TeraSmart |
|--------------|-----------|

Please call for pricing. Specifications are subject to change without notice. Custom modifications are available, please inquire.

