

# TeraSmart

## Compact Industry-Proven THz-TDS System



Fiber-Coupled THz Emitter/Receiver

### Redefining Terahertz Technology

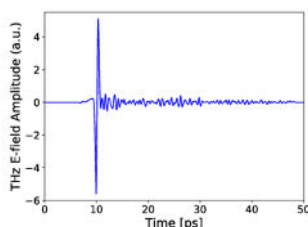
Our next-generation terahertz time-domain solutions set a new benchmark in speed, power, and performance. At a 50 ps scan range, our systems deliver over 125 traces/s, 6.5 THz of bandwidth, and >100 dB of dynamic range, all in under 5 seconds. Reducing the scan range pushes performance even further, reaching record speeds of over 330 Hz. These performance levels remain unmatched in the industry.

The newly-upgraded flagship system, TeraSmart, our most compact spectrometer, features high power TERA15 antenna modules, ultrafast optical delay unit (1700 ps), and our new transimpedance amplifier for seamless industrial, academic, or OEM integration.

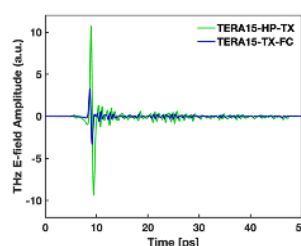
The available multichannel setup options enable simultaneous measurements with multiple emitter/detector pairs, powered by a single femtosecond fiber laser oscillator. The new TeraSmart is more versatile and customizable than ever, now supporting high-power pump-probe applications with 1 W of pump power at 780 nm. Other enhanced features, like an intuitive software interface, new TERA Image linear stages, and intelligent TCP socket connectivity, make TeraSmart ideal for non-destructive testing and manufacturing line automation.

### PERFORMANCE DATA

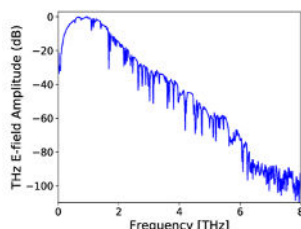
#### Time domain data:



#### New! Comparison of our emitters



#### Frequency domain data:



- TERA15-HP-TX measurement settings: 200 V bias with 50 mW optical powers at 126 Hz scan speed to achieve >6 THz and up to 110 dB in 1.5 sec
- All measurements were conducted under ambient conditions without purging

## 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

- >330 Hz Scan Speed
- >100 dB in <5 s (typ. 2.5 s) @ 50 ps Scan Range
- >6 THz (typ. 6.5 THz)
- Up to 110 dB Dynamic Range
- Up to 250  $\mu$ W Average THz Power
- Scan Range 1700 ps, Flexible Setting of Range and Speed
- High Spectral Resolution <0.6 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 & TeraLyzer pro**  
Advanced Software for THz Data Analysis
- **Mirror or Polymer Lens Optics**
- **Custom Fiber Length**
- **THz Path Length Adaptation**  
>3 m on request

## Compact Industry-Proven THz-TDS System

### THZ SPECIFICATIONS

Fast Scanning Speed	125 traces/s @ 50 ps
Spectral Range	>6 THz (up to 6.5 THz)
Dynamic Range	>100 dB (up to 110 dB)
Average Power	Up to 250 $\mu$ W
Total Scan Range	1700 ps flexible scan range and speed, customizable THz path length >3 m
THz Frequency Resolution	< 0.6 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

### DETAILED SPEED SPECIFICATIONS

Scan length (ps)	Scan frequency (Hz)
5	>335
10	>260
25	>170
50	>125
100	>85
150	>70
200	>10

### SYSTEM DIMENSIONS AND WEIGHT

Enclosure	19" x 3U (448 x 132 x 646 mm <sup>3</sup> ), 26 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
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Please call for pricing. Specifications are subject to change without notice. Custom modifications are available, please inquire.

