TeraSmart

Compact Industry-Proven THz-TDS System

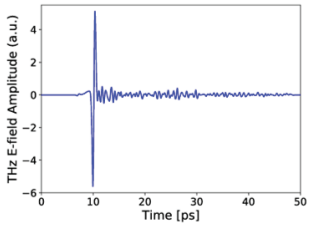
MenloSystems

Introducing our new generation TeraSmart Systems with unparalleled performance

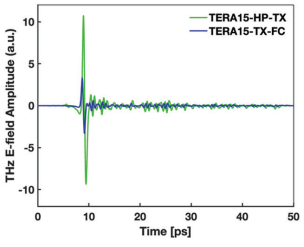
The TeraSmart, an established broadband terahertz spectrometer recognized for its compact design and reliability, has undergone remarkable advancements, setting a new standard for industrial performance.
The integration of our new groundbreaking TERA15 antenna modules with high-power capabilities has advanced the system's already impressive performance to a new level, establishing it as a market leader in terms of THz power, dynamic range, bandwidth, flexibility, and customization.
In addition to its user-friendly turnkey functionality, TeraSmart utilizes Menlo Systems' cutting-edge fiber-based femtosecond laser sources with our proprietary figure 9® mode locking technology. The modular design, incorporating the ELMO OEM laser platform, enhances adaptability, enabling tailored configurations for seamless integration into both industrial and academic environments.
Multichannel setups are possible, allowing for simultaneous measurements using multiple emitter/detector pairs, all powered by a single femtosecond fiber laser oscillator. The incorporation of an intelligent TCP socket interface enables remote control, advantageous for non-destructive testing of hazardous samples, and smooth integration into manufacturing lines.
TeraSmart is a compact, turnkey, and integratable terahertz spectrometer designed for continuous 24/7 operation. Additionally, the high levels of attainable THz power expand the potential applications of THz spectroscopy and imaging, making previously unexplored and challenging applications (e.g., analysis of highly absorbing, thick, and biological samples with high water content) in the terahertz region more accessible than ever before. Furthermore, users of existing THz systems can seamlessly upgrade to the new high-power antennas.

PERFORMANCE DATA

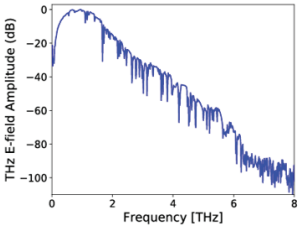
Time domain data: TERA15-TX-FC



New! Comparison of our emitters



Frequency domain data: TERA15-TX-FC



- TERA15-TX-FC measurement settings: 100 V bias with 25 mW optical powers at 24 Hz scan speed to achieve >6 THz and >95 dB in 60 sec
- TERA15-HP-TX measurement settings: 200 V bias with 50 mW optical powers at 24 Hz scan speed to achieve >6 THz* and up to 110 dB in 60 sec
- All measurements were conducted under ambient conditions without purging

HIGHLIGHTS

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

KEY SPECIFICATIONS

- >6 THz* Bandwidth
- > 100 dB (Up to 110 dB*) Dynamic Range
- Up to 300 µW* Average THz Power
- 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 & TeraLyzer pro**
  Advanced Software for THz Data Analysis
- **Mirror or Polymer Lens Optics**
- **Custom Fiber Length**
- **THz Path Length Adaptation**
  >3 m on request

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THZ SPECIFICATIONS

Spectral Range	>6 THz* Bandwidth
Dynamic Range	> 100 dB (Up to 110 dB*)
Average Power	Up to 300 µW *
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

* Specifications for systems with high-power emitter. High-power bandwidth only guaranteed when using newer generation detector. **Allows for optional multichannel extension (up to 4 laser ports).

SYSTEM DIMENSIONS AND WEIGHT

Enclosure	19'' x 3U (448 x 132 x 495 mm^3), 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

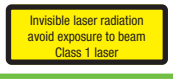
REQUIREMENTS

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.



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