Terahertz High-Power Pump-Probe Solutions

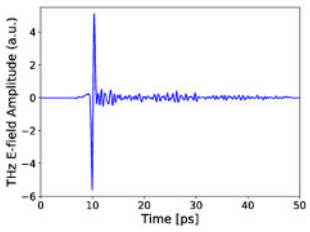
MenloSystems

Experience next-generation high-power THz pump-probe spectroscopy in a truly compact, turnkey package. Engineered around your workflow, our solution simplifies installation and maximizes bench space: only the ELMO 780 XHP head sits on your optical table, while the TeraSmart, Pump-Probe Delay Unit (TPPU), and the Laser Control Unit (LAC) are either rack-mounted or placed below, keeping your workspace clear and vibration-free.

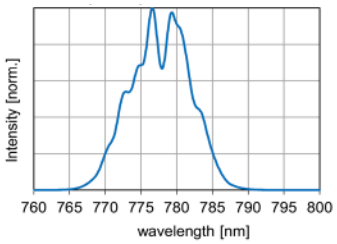
To best fulfil your application needs, we offer fully-synchronized multicolor outputs with customizable power levels (see table below), as well as our intuitive and easy-to-use software for data-acquisition and analysis.

PERFORMANCE DATA

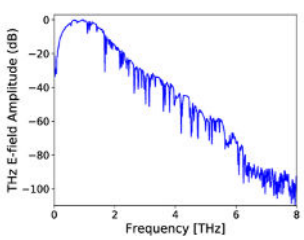
Time domain data



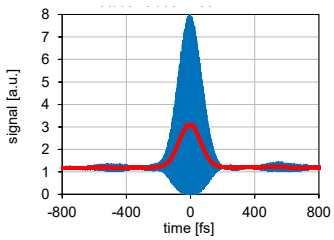
Optical spectrum 780 nm



Frequency domain data



Autocorrelation 780 nm



HIGHLIGHTS

- Quick and Easy Setup- No Complex System Integration Needed
- Saves Valuable Optical Table Space
- Versatile Applications- With Multi-color or Multi-pulse Excitation
- High Signal Stability and Precise Measurements

KEY SPECIFICATIONS

THz Performance

- >6 THz (typ. 6.5 THz)
- >125 Traces/s @ 50 ps
- Up to 110 dB Dynamic Range
- Up to 250 µW Average THz Power
- Scan Range of 1700 ps

Pump-Probe

- 1700 ps Pump-Probe Delay Stage
- Available Outputs with Femtosecond Pulses: 1560 nm, 780 nm, 390 nm

APPLICATIONS

- Material Science:
  Ultrafast Carrier Dynamics in Semiconductors and 2D Materials
- Biophotonics:
  Non-invasive Probing of Molecular Vibrations and Protein Structures
- Testbed for THz Components Development:
  e.g., Photoconductive Antennas, Quantum Cascade Lasers (QCL)

FEATURES

- All-Integrated Turnkey System
- Compact Footprint
- Multiple Synchronized Outputs
- Customizable Power Output Levels
- Vibration-Free Measuring Environment
- Ready for OEM Integration

OPTIONS

- **Dual-Detection:**
  Suitable for parallel transmission & reflection measurements (one high-power emitter with two receivers)
- **Multi-Channel:**
  Two pairs of high-power emitters and receivers for two separate measurement setups (e.g., transmission & reflection) with one engine

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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 µW
Total Scan Range	1700 ps flexible scan range and speed, customizable THz path length
THz Frequency Resolution	<0.6 GHz
Antenna models	TERA15-HP/TERA15-FC
Laser System Repetition Rate	100 MHz, with optional synchronization to an external source upon request

DETAILED SPEED SPECIFICATIONS

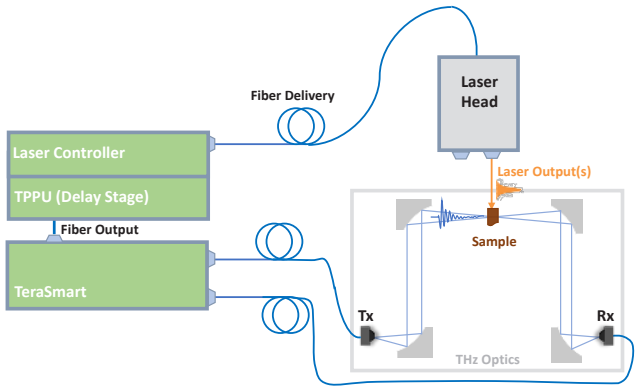
Scan length (ps)	Scan speed (Hz)
5	>335
10	>260
25	>170
50	>125
100	>85
150	>70
200	>10

OPTICAL OUTPUT SPECIFICATIONS (CONTACT US FOR CUSTOM OUTPUTS)

Wavelength	1560 nm	780 nm	390 nm (Optional)
Average Output Power	Up to 1 W	>1 W (typ. 1.2 W)	>200 mW (typ. >250 mW)
Auxiliary Output Ports	Free space port	Free space port	Free space port

SYSTEM DIMENSIONS AND WEIGHT

ELMO 780 XHP (Laser head)	240 x 170 x 79.5 mm^3 / <5 kg
LAC	19”, 2 HU (449 x 496 x 96 mm^3) / <20 kg
TeraSmart	19” x 3U (448 x 132 x 646 mm^3), 26 kg
TPPU	19” x 3U (448 x 132 x 495 mm^3), 13 kg

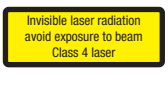


Schematic of an optical pump–THz probe setup, with all key components seamlessly integrated in-house for optimal performance and reliability.

ORDERING INFORMATION

Product Code	TeraSmart Pump-Probe

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



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