



# LASER BEAM MEASUREMENT & BEAM PROFILING

## PRODUCT OVERVIEW 2024

■ POWER ■ ENERGY ■ PROFILING ■ TERAHERTZ

# WHO WE ARE

Gentec-EO: Partners for accuracy



**gentec-EO**  
PARTNERS for ACCURACY



## MILESTONES

The first laser energy meter in the world has been initially developed for internal use as Gentec Inc. were putting the first high repetition rate TEA CO<sub>2</sub> lasers on the market in 1970. Gentec, Inc. introduced the first pyroelectric joulemeters shortly after that. They were also the first to manufacture both thermopile wattmeters and pyroelectric joulemeters. In the mid 1990's, Gentec introduced the WB series with an average power density damage threshold of 100 kW/cm<sup>2</sup> that is still unrivalled today. In 2000, Gentec Electro-Optics, Inc. was formed from Gentec, Inc. so that the focus was entirely on laser measurement. And in 2010, the acquisition of Spectrum Detector Inc. allowed Gentec-EO to cover new markets, like THz detectors, ultrafast pyroelectric detectors and highly sensitive photodetectors, to name a few.

## OUR ESSENCE

The decision of adopting "PARTNERS for ACCURACY" as our branding slogan is the result of a long evolution that spanned over more than 50 years. It came to us naturally since it represents our very essence. We have always aspired to be more than a simple supplier of state-of-the-art laser measurement technologies. We truly believe that developing a very close partnership with our customers is essential and beneficial for every party. By definition, "partnership" means "aiming at the same goal" and "working together". This is what is driving us. As for "accuracy", it does not solely refer to the precise measurements we are able to provide, but also to the complete understanding of our customers' needs and expectations. Finally, the key to our success is to focus all our energy into "rigor". No matter what the situation, Gentec-EO is always proud to offer its customers the most accurate laser measurements as well as the most personalized help for the development of custom products and solutions.

Let us be your **PARTNERS for ACCURACY**.

## WORLDWIDE PRESENCE

Gentec-EO has an evergrowing presence everywhere around the world. We currently have partners in over 40 countries, and each year, we keep adding new partners. We also have a strong presence in most of the European and Asian countries and we now have offices in USA and in Japan. When you send a unit to us for repair or recalibration, you are entitled to expect your unit back in as short a time as possible.

With calibration centers on 3 continents, and offices in Canada, USA and Japan, Gentec-EO has a solid presence and fast turnaround times, just what you need to keep pace with today's rapid market.

# HIGHEST CALIBRATION STANDARDS

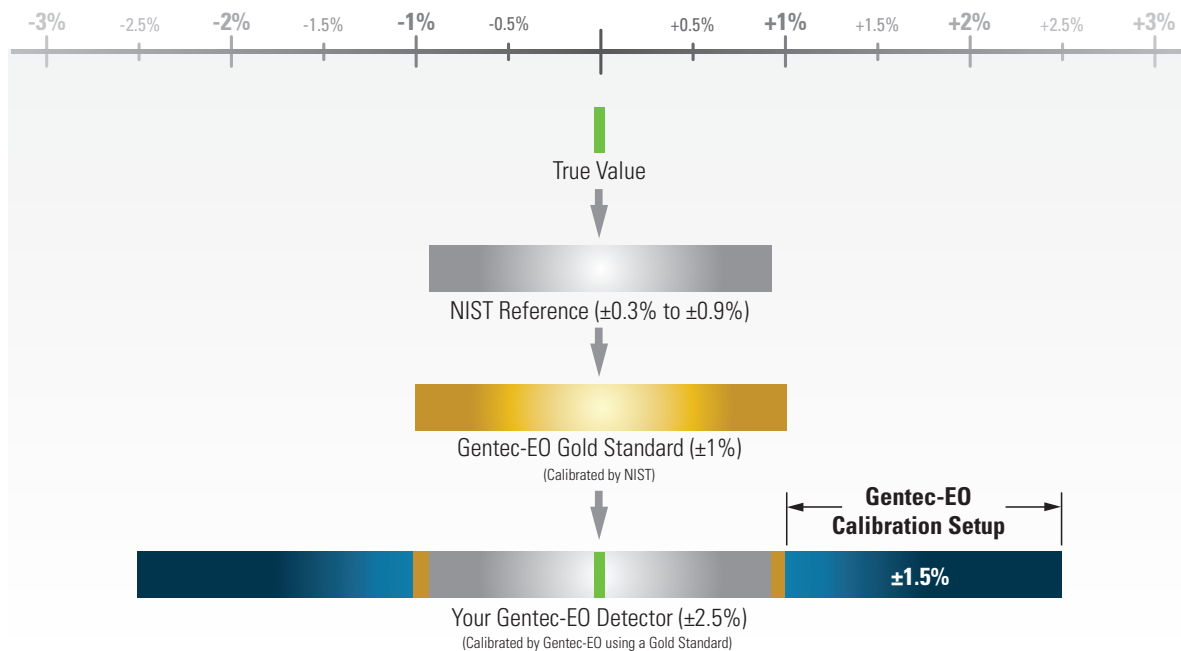
Measuring with Gentec-EO accuracy

## HOW GENTEC-EO CALIBRATES YOUR DETECTOR

Every detector is individually calibrated to the best possible accuracy traceable to NIST standards. Stable laser sources at various wavelengths are used in our calibration process.

### UNCERTAINTY

One very common misconception is the absolute value of calibration uncertainty. Be aware that this value is made using a complex statistical method that takes in account ALL the sources of uncertainty that are present in the process. The figure below shows these steps and their respective contribution to the value of uncertainty. As you can see, the manufacturer itself is only one of these sources.



### CALIBRATION WAVELENGTHS

Another misconception is that any wavelength can be NIST calibrated. The NIST only supplies references for distinct wavelengths contained between 157 nm ( $F_2$  excimer lasers) and 10.6  $\mu\text{m}$  ( $CO_2$  lasers). Every other wavelength within this range or out of this range is subject to an additional error.

For more information about NIST's calibration wavelengths, please visit their website at: <https://www.nist.gov/calibrations>

### PERSONAL WAVELENGTH CORRECTION™ CERTIFICATE

To fill the gaps between the NIST references, Gentec-EO offers you the only NIST traceable calibration in nm steps, from 250 nm to 2.5  $\mu\text{m}$ . We achieve this using our proprietary setup that is based on a NIST traceable spectrophotometer. This way, instead of supplying you with typical values, we offer you a NIST traceable calibration. What you get is an overall accuracy that is not more than  $\pm 1\%$  away from the original calibration accuracy, in the calibrated spectral range.

Each Gentec-EO detector comes with a Personal wavelength correction™ Certificate. The correction factors are based on measurements that were made with YOUR detector. They are not based on the general curve of the absorbing material or the general response of equivalent products. This means you get the best wavelength correction tool available on the market. This data is stored in the smart interface of your Gentec-EO detector, you just have to select the wavelength in your display device or PC interface to get the most precise laser measurements on the market.

# POWER DETECTORS

Calibrated, low power measurement

Available with  
**integra**



## PH: PHOTODETECTORS

- Photodetectors for measurements up to 750 mW
- Available from UV to IR
- Silicon, UV-silicon and germanium sensors
- OD.3/OD1/OD2 attenuators available

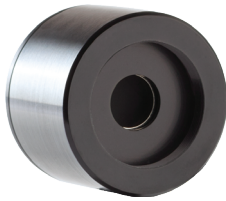
■ FAST RESPONSE POWER DETECTORS



## PRONTO-SI: ALL-IN-ONE PHOTODETECTOR + METER

- Compact laser power meter up to 800 mW
- 10 x 10 mm aperture
- Integrated OD1 slide-in attenuator
- Color touchscreen display

■ PORTABLE & EASY TO USE



## UM: BROADBAND PYROELECTRIC DETECTORS

Our pyroelectric power detectors have the noise level of a photodetector, but with the large bandwidth of a pyroelectric sensor. They have everything you need to accurately measure extremely low powers from the DUV to the FIR.

- 9 mm Ø aperture
- Broadband, flat spectral response
- Very low noise, down to 5 nW

■ MEASURE LOW POWER AT ANY WAVELENGTH

Available with  
**integra**

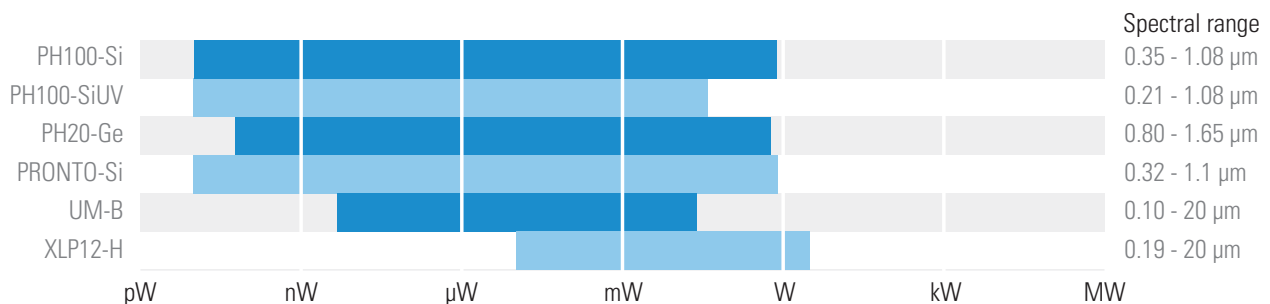


## XLP12: LOW-POWER THERMOPILES

- Low noise level: only  $\pm 0.5 \mu\text{W}$
- IR filter available
- Available with volume absorber for short pulses

■ THERMAL POWER DETECTORS WITH LOW NOISE

## COMPARISON TABLE - LOW POWER MEASUREMENT



# POWER DETECTORS

Calibrated laser power measurement

Available with  

  
 integra



## UP-H: BROADBAND THERMAL DETECTORS

Our standard absorber offers high damage thresholds and a flat spectral response, making this series of power detectors a versatile solution that can cover most of your laser power measurement needs.

- Available in 6 sizes:
 

10 mm Ø	12 mm Ø
17 mm Ø	19 mm Ø
25 mm Ø	55 mm Ø
- Available with 5 cooling modules:
  - Convection (S)
  - Small heatsink (H)
  - Large heatsink (L)
  - Fan (F)
  - Water (W)



■ THE WIDEST RANGE OF LASER MEASUREMENTS

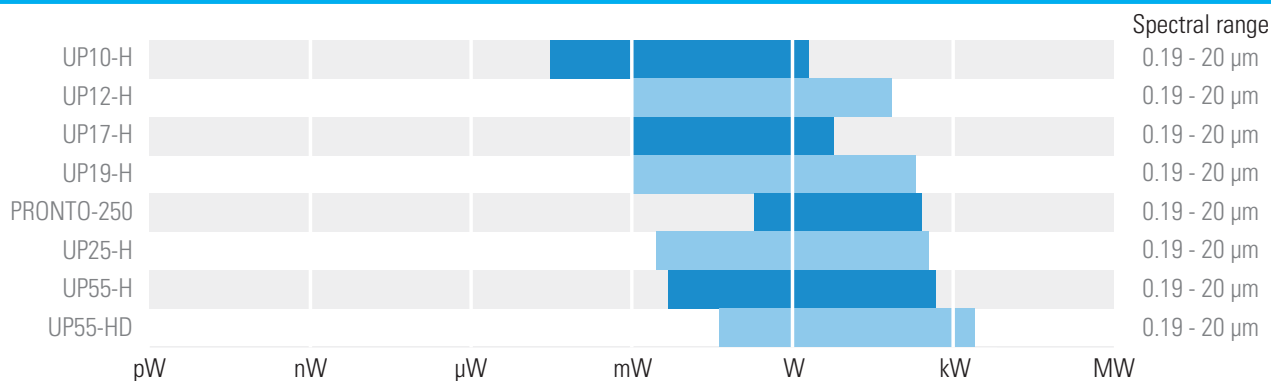
## PRONTO-250-FLEX

- Compact laser power meter up to 250 W
- Three measurement modes :
  - Single-Shot Power (SSP): up to 250 W
  - Continuous Power (CWP): up to 8 W
  - Single Shot Energy (SSE): up to 25 J
- The FLEXibility to pick only the calibrations you need:
  - Default calibration "Y": for visible to NIR wavelengths (248 nm to 2.5 µm)
  - Additional calibration "C": for CO<sub>2</sub> lasers (10.6 µm)
  - Additional calibration "E": for energy measurements with ± 5 % accuracy

■ PORTABLE & EASY TO USE



## COMPARISON TABLE - GENERAL USE POWER DETECTORS



# POWER DETECTORS

High performance laser power measurement

Available with  
*integra*



## UP-W

Our "W" absorber can handle tightly focused beams thanks to its extremely high damage threshold for average power density. It can be used to measure up to 50 W, from the UV to IR.

- Available in 2 sizes: 19 mm or 50 mm Ø aperture
- High damage threshold absorber (100 kW/cm<sup>2</sup>)
- Our highest maximum average power density

■ IDEAL FOR UV LASERS & TIGHTLY FOCUSED BEAMS

Available with  
*integra*



## UP-QED

The UP-QED series are power detectors for lasers with extreme power and energy density, such as laser micromachining systems. Thanks to a proprietary absorber that diffuses the measured beam and absorbs it in a larger volume, these detectors have the highest damage thresholds on the market.

- Available in 2 sizes: 16 mm or 52 mm Ø aperture
- Our highest maximum average power density
- Our highest maximum energy density
- Not suitable for UV lasers

■ THE HIGHEST DAMAGE THRESHOLDS ON THE MARKET!



Available with  
*integra*

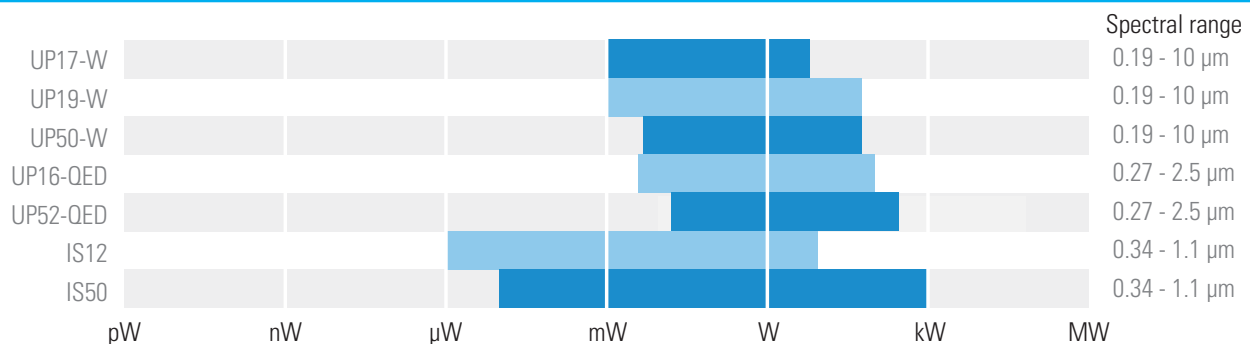
## IS: INTEGRATING SPHERE POWER METER

Get the best of both worlds with our new integrating sphere power meters. This technology offers the fast risetime of photodetectors with the high average power of thermal detectors.

- Fast risetime: 0-95 % in less than 0.2 seconds
- Measures up to 1000 W of continuous power
- Available in 2 sizes: 12 mm or 50 mm Ø aperture
- Integrated signal processing with USB or RS-232 output

■ FAST AND ROBUST POWER MEASUREMENT

## COMPARISON TABLE - HIGH PERFORMANCE POWER DETECTORS



# POWER DETECTORS

Calibrated, high power laser measurement

Available with



## HP60: HIGH POWER, LOW BACK-REFLECTIONS

The gold reflector cone of the HP60 series is specifically designed to handle the high intensities of very small beams. By reflecting the incident light on the sides of the aperture, the cone effectively spreads the intensity on a larger area, thus raising the damage threshold to 10 kW/cm<sup>2</sup> at the full power (15 kW).

■ FOR SMALL BEAMS UP TO 15 KW

Available with



## HP100/125: LARGE APERTURE, COMPACT DEVICE

The HP100A and HP125A are the smallest in our HP series of high-power detectors. They are versatile high-power detectors that measure up to 15 kW of continuous power with a noise level of only a few watts. These models feature a very large aperture of 100 or 125 mm Ø.

■ CONTINUOUS POWER MEASUREMENT UP TO 15 KW

Available with



## SUPER HP: CUSTOM, HIGH-POWER MEASUREMENT

Our unique high-power design allows for infinite customization capabilities. Do not hesitate to contact us with your specific needs. Our Super HP models feature a USB output for direct measurements on a PC as well as our standard DB15 connector. Wireless output is also available.

■ CUSTOM SOLUTIONS FOR UP TO 150 KW

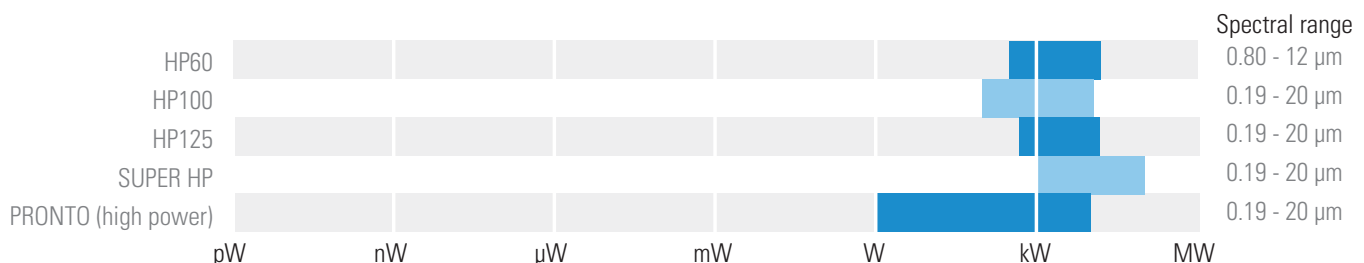
## PRONTO: PORTABLE HIGH-POWER PROBES

When you are on the go and water cooling is not easily accessible, the PRONTO high-power probes are the best solution. These all-in-one power meters with touchscreen controls come in 4 models: 500 W, 3 kW, 6 kW and 10 kW. Their integrated display is encased in a rugged metallic casing to withstand the harshest of environments.

■ UP TO 10 KW WITHOUT WATER COOLING



## COMPARISON TABLE - HIGH POWER MEASUREMENT

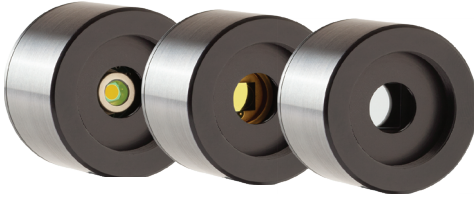


# ENERGY DETECTOR

Calibrated, low energy measurement

Available with  
*integra*

## PE: PHOTODETECTORS

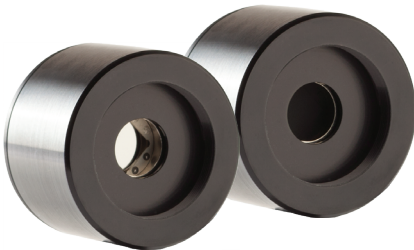


- Available in 3 sizes:
  - 3 mm Ø
  - 5 mm Ø
  - 10 mm Ø
- 3 choices of absorber for different wavelength ranges:
  - Silicon
  - Germanium
  - InGaAs
- Extremely low noise: as low as 8 fJ

■ LOWEST NOISE LEVEL OF ALL ENERGY DETECTORS

Available with  
*integra*

## QE-B: HIGH-SENSITIVITY PYROELECTRIC DETECTORS



Our pyroelectric energy detectors have very low noise levels combined with a large bandwidth. They have everything you need to accurately measure extremely low energy from the DUV to the FIR.

- 8 mm Ø aperture
- 2 choices of absorber:
  - MT: Fast response and high sensitivity
  - BL: Flat spectral response
- Broadband, from the DUV to the FIR
- Very low noise: as low as 50 nJ

■ MEASURE LOW ENERGY AT ANY WAVELENGTH

## MACH 6: MEASURE ALL PULSES UP TO 200 KHZ



- High-speed digital joulemeter:
  - Measures EVERY PULSE at 200 kHz
- Capture and store up to 4 million pulses at the maximum repetition rate
- Track missing pulses and pulses below threshold
- Wide energy range: measure from pJ to mJ

■ 200 kHz ENERGY METER



# ENERGY DETECTORS

Calibrated energy measurement



Available with  
**integra**

## QE-MB

Pyroelectric energy meters cover a very wide range, going from nanojoules to several tens of joules per pulse. Our standard absorber offers high damage thresholds and a spectrally flat response, making this series of energy detectors a versatile solution that can cover most of your energy measurement needs.

- Broadband absorber with high damage thresholds
- Available in 7 sizes:
  - 12 x 12 mm
  - 25 x 25 mm
  - 50 x 50 mm
  - 65 x 65 mm
  - 95 mm Ø
  - NEW** 145 mm Ø
  - NEW** 195 mm Ø
- Available with 2 cooling modules:
  - Convection (S)
  - Heatsink (H)

■ THE WIDEST RANGE OF LASER ENERGY MEASUREMENT

Available with  
**integra**



## QE-MT: HIGH REPETITION RATES

Designed for pulsed lasers with high repetition rates, these energy detectors feature an improved temporal response to accurately measure pulse-to-pulse energy at high repetition rates up to 10 kHz.

- Fast response, broadband absorber
- Available in 3 sizes:
  - 12 x 12 mm
  - 25 x 25 mm
  - 50 x 50 mm
- Available with 2 cooling modules:
  - Convection (S)
  - Heatsink (H)

■ UP TO 10 KHZ REPETITION RATE

## COMPARISON TABLE - ENERGY MEASUREMENT

Model	Energy Range	Spectral range	Max rep. rate
PE	pJ to kJ	Depends on model	1000 Hz
M6	nJ to mJ	Depends on model	200 000 Hz
QE-B	µJ to J	0.19 - 20 µm	1000 Hz
QE12, QE25	µJ to J	0.19 - 20 µm*	10 000 Hz
QE50	µJ to J	0.19 - 20 µm*	4000 Hz
QE65, QE95	µJ to J	0.19 - 20 µm*	100 Hz
QE145, QE195	µJ to J	0.19 - 20 µm*	Contact us
IS50	mJ to J	Contact us	1000 Hz
PRONTO	µJ to J	0.19 - 20 µm	Single-shot
UP in SSE mode	µJ to J	0.19 - 20 µm	Single-shot
Calorimeters	µJ to kJ	Contact us	Single-shot

\* QED models are represented by dashed area and have a limited spectral range: 0.3 - 2.1 µm

# ENERGY DETECTORS

QED attenuators to measure higher energy

The QED attenuators increase the maximum energy, energy density, average power and average power density that the QE series detectors can handle. They are engineered to typically transmit 30-50 % (at 1064 nm) of the incident radiation to the detector in a near Lambertian pattern (very wide diffusion pattern). Their slide-in casing make them easy to install and remove and they are held securely in place with the use of simple set screws. Since they become part of the detector, it is important to understand how they will affect the calibration.

## CALIBRATION OPTIONS

Depending on how you plan to use a QE detector and QED attenuator, different purchasing and calibration options are available.

### QE detector with QED attenuator included

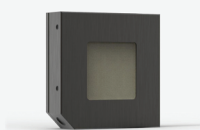


Product name contains "-QED"

Ex: QE25LP-S-MB-**QED**-D0

This product is calibrated with the QED attenuator in place. You may remove the attenuator, but your measurements will not be calibrated with this configuration.

### QE detector and QED attenuator purchased separately



OR



Product name does not contain "-QED"

Ex: QE25LP-S-MB-D0 and QED-25

Three calibration options are available when you purchase the QE detector and the QED attenuator separately.

#### FULL CALIBRATION

The detector is fully calibrated both with and without attenuator. This configuration comes with a DB15 adaptor.

• [QED-CAL-3](#)

#### PARTIAL CALIBRATION

The detector is fully calibrated without attenuator, and is calibrated at a single wavelength with the attenuator.

• [QED-CAL-1](#)

#### NO EXTRA CALIBRATION

The QE detector is fully calibrated without attenuator only. You may add the attenuator, but your measurements will not be calibrated with this configuration.

Detector alone	Fully calibrated	Fully calibrated	Fully calibrated
Detector with attenuator	Fully calibrated when using the DB15 adaptor	Calibrated at 1064 nm only	Not calibrated

## SPECIFICATIONS

PHYSICAL CHARACTERISTICS	QED-12	QED-25	QED-50	QED-65	QED-95
Spectral range	266 - 2100 nm	266 - 2100 nm	266 - 2100 nm	266 - 2100 nm	266 - 2100 nm
Calibrated spectral range	532 - 2100 nm	308 - 2100 nm	308 - 2100 nm	308 - 2100 nm	308 - 2100 nm
Effective aperture	9 x 9 mm	22 x 22 mm	47 x 47 mm	62 x 62 mm	90 mm $\varnothing$
Dimensions	30.5H x 41W x 12.5D mm	44H x 55W x 12.5D mm	69H x 80W x 12.5D mm	85H x 97W x 12.5D mm	115H x 127W x 12.5D mm
For use with	QE12	QE25	QE50	QE65	QE95

# ENERGY DETECTORS

High energy detectors



## IS50: ENERGY METER FOR HIGH AVERAGE POWER

Custom-built to your specifications, contact us with your laser measurement needs

- Designed for high energy measurements at high repetition rates
- Can handle up to 1000 W average power
- Our proprietary coating offers damage thresholds that are orders of magnitude higher than any other "white" coating on the market.

■ IDEAL FOR IPL SOURCES: UP TO 350 J



Available with  
*integra*  


## THERMOPILES IN SINGLE-SHOT ENERGY MODE

MEASURE ENERGY WITH A POWER DETECTOR

The single-shot energy mode, available with all our thermal power detectors, allows you to measure the energy of single pulses or pulse trains.

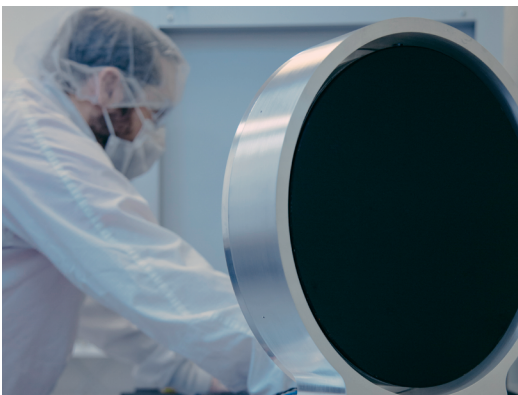
■ SEE "ENERGY MODE" IN THE POWER DETECTOR SPECIFICATIONS



## PRONTO-500-IPL

- Compact energy meter for up to 350 J
- 55 mm Ø aperture
- Color touchscreen display
- Rugged device: all-metal body and protective window

■ IDEAL FOR IPL SOURCES: UP TO 350 J



## CUSTOM CALORIMETERS

We work with a wide range of materials from surface coatings to the most robust volume absorbers to provide the best solution for your specific application.

- Outstanding signal-to-noise ratios
- High sensitivity
- Vacuum compatibility
- Attention to detail and workmanship

With over 50 years of experience in thermal-based energy measurement, Gentec-EO is the ideal choice for all your high energy measurement needs.

# BEAM PROFILING

Overview of the different models



## BEAM PROFILING CAMERAS

Profiling a laser beam is a convenient complement to the measurement of its power or energy because it provides very useful additional information, like spatial energy or intensity distribution, beam widths, centroid, ellipticity and orientation, that may help you determine if your laser-based systems are operating optimally.

The Beamage is the most cost-effective USB3.0 Beam Profiling Camera on the market. It is available for UV to IR wavelengths and in 2 sizes. It comes with an intuitive and complete software that features an array of useful tools and functions. Its calculations are ISO compliant.

## MAIN SPECIFICATIONS

	BEAMAGE-4M	BEAMAGE-4M-IR	BEAMAGE-4M-FOCUS
Wavelength range			
Camera only	350 - 1150 nm	1495 - 1595 nm	350 - 1150 nm
With UG11-UV filter	250 - 370 nm	---	---
With B3-IR-Filter	1250 - 1350 nm	---	---
Pixel count	4.2 MPixels	4.2 MPixels	4.2 MPixels
H x V	2048 x 2048	2048 x 2048	2048 x 2048
Sensor size	11.3 x 11.3 mm	11.3 x 11.3 mm	20.5 x 20.5 mm

## BEAM QUALITY MEASUREMENT

The performance of a laser in practical applications is critical in the design of optical systems and focusing applications, and it can be quantified by measuring M2, the laser beam quality factor, which indicates how close a laser is to being an ideal Gaussian beam.

The Beamage-M2 acquires a sequence of beam profile measurements to automatically perform beam quality measurements within a few seconds. It is equipped with the largest optics on the market for easy alignment and fast measurements that you can trust. Its software is both intuitive and ISO compliant.



# BEAM PROFILING

Expand your measurement capabilities with accessories



IF YOUR **LASER SPECIFICATIONS EXCEED THE LIMITS** IN TERMS OF

YOU CAN MANAGE THEM WITH THE ACCESSORIES PRESENTED BELOW

> **WAVELENGTH**

> **BEAM SIZE**

> **LASER POWER**

## MANAGE THE WAVELENGTH



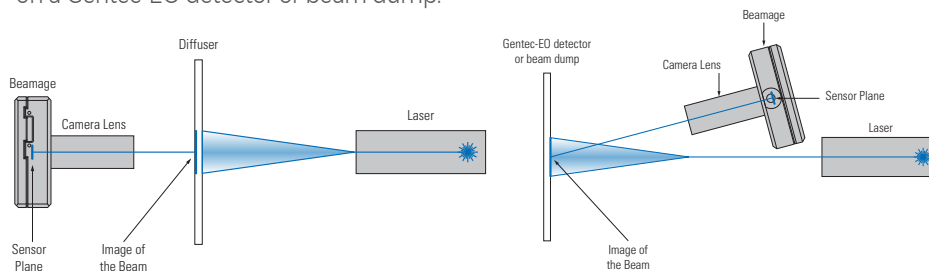
Since CMOS sensors are not sensitive to every frequency of the electromagnetic spectrum, we offer several wavelength management solutions to enhance the capabilities of the Beamage beam profiling cameras.



## MANAGE THE BEAM SIZE



A simple solution is offered to those who need to profile beams that are larger than the CMOS sensor (> 11.3 mm x 11.3 mm). This solution is a beam reducing optical component called camera lens. It works either by indirectly imaging the transmission of the beam after it has passed through a diffusing element or by directly imaging the beam that is incident on a Gentec-EO detector or beam dump.



## MANAGE THE LASER POWER



CMOS sensors have low saturation levels as well as low damage thresholds. It is thus very important that you control your laser power to get the best measurement possible and avoid damaging the Beamage camera.

- For laser power under 1 W, you can attenuate the beam with ND filters
- For laser power up to 1000 W, you can sample a small fraction of the beam with a BA optical sampler

# DISPLAYS & PC INTERFACES

Signal processing units for Gentec-EO detectors

We offer four models of meters with display: MIRO ALTITUDE and MAESTRO for both power and energy measurements, as well as TUNER and UNO for power readings. Connect one of these display devices to your detector and you have a complete laser power or energy measurement system



## MIRO ALTITUDE

MIRO ALTITUDE is Gentec-EO's flagship product for reading laser power and energy. It was designed to help engineers and service technicians increase their productivity thanks to numerous innovative features in both hardware and software. Enter modern times of laser beam measurement with MIRO ALTITUDE.

Supercharge your productivity with an intuitive user interface, an extra large screen, tons of connectivity possibilities, 3 convenient display modes, a built-in dataviewer and a built-in file manager.

■ PROFESSIONAL LASER POWER & ENERGY METER



## MAESTRO

The MAESTRO power & energy meter is our top of the line display device with an extra-large 5.6 in color LCD display and fully touchscreen controls. With its unique user interface and faster electronics, it will do more, in less time, and with less effort than any other meter on the market!

■ LASER POWER & ENERGY METER

The Gentec-EO PC interfaces come in various sizes and types to cover all applications. We offer models for power or energy measurement, or both. Most of our PC interfaces are single-channel, and we also offer models with either 2 channels or even up to 4 channels.



## LINK SERIES

The U-LINK, P-LINK, S-LINK and M-LINK are PC interfaces for our power or energy detectors and are provided with free software applications.

- U-LINK is a universal power & energy meter that measures ALL detectors in our product range up to 10 kHz repetition rate. It has a very small footprint.
- P-LINK is a small power meter, available with either a USB or RS-232 connector. A 4 Channel version is also available.
- S-LINK comes with 1 or 2 channels and measures energy detectors at a very fast rate. It comes with a USB connector, Ethernet also available in option.
- M-LINK is a universal power & energy meter that measures ALL detectors in our product range and features a unique noise suppression method.

■ PC-BASED POWER OR ENERGY METERS

# DISPLAYS & PC INTERFACES

## Overview of the PC interfaces

### DISPLAY DEVICES



	MIRO ALTITUDE	MAESTRO	TUNER	UNO
Detector Compatibility				
Power measurement	UP, XLP, PH, HP	UP, XLP, PH, HP, UM-B, THZ-D	UP, XLP, PH & HP	UP, XLP, PH & HP
Energy measurement	QE, also UP & XLP in SSE mode	QE, PE, also UP & XLP in SSE mode	N/A	N/A
Display	10in touchscreen	5.6in touchscreen	3.8in LCD, backlit	3.8in LCD
Output	2xUSB, USB-C, RS-232, Ethernet	USB, RS-232, Ethernet, analog output	Analog output	N/A
Data logging	Internal memory and USB key	USB key	N/A	N/A
External trigger	Yes	Yes	N/A	N/A
Number of channels	1	1	1	1

### PC INTERFACES



	U-LINK	P-LINK	S-LINK	M-LINK
Detector Compatibility				
Power measurement	UP, XLP, PH, UM-B, THZ-D	UP, XLP & PH	UP & XLP	UP, XLP, PH, THZ-D
Energy measurement	QE, PE, also UP & XLP in SSE mode	UP & XLP in SSE mode	QE, PE, also UP & XLP in SSE mode	QE, PE, also UP & XLP in SSE mode
Output	USB, analog output & sync. out. RS-232 available on certain models	USB & analog output. RS-232 available on certain models	USB & Ethernet	USB & analog output
External trigger	Yes	N/A	Yes	Yes
Maximum repetition rate	10 kHz/channel	N/A	10 kHz/channel	1 kHz
Number of channels	1	1 or 4, depending on model	1 or 2, depending on model	1

### DEDICATED PC INTERFACES



	T-RAD	T-RAD-ANALOG	QUAD-4TRACK	MACH 6	APM (D)
Detector Compatibility					
Power measurement	THZ-B series (-DZ models)	THZ-B series (-DA models)	QUAD-P series	N/A	UM-B series & THZ9D
Energy measurement	N/A	N/A	QUAD-E series	M6 series	M6 (with adaptor), QE-B & PE-B series
Output	USB & analog output	Analog output	USB & analog output	USB & analog output	Analog output
External trigger	Yes	Yes	Yes	Yes	N/A
Maximum repetition rate	N/A	N/A	1 kHz	200 kHz	Depends on the detector
Number of channels	1	1	4 (1 detector)	1	1

# ALL-IN-ONE DETECTORS

Portable and cost-effective solutions

We also offer displays and PC interfaces which are integrated with the detector head. We offer four families of these all-in-one detectors. INTEGRA features either a USB or RS-232 output for a direct connection to your PC. BLU is available for all our thermal power detectors and allows you to view and log power measurements on your mobile device or PC. PRONTO includes a display, so you have everything you need in a single, portable device.



## INTEGRA

The INTEGRA version of our standard laser power or energy detectors allows you to read your measurements directly on your PC thanks to our free software.

Simply carry your all-in-one detector and plug it in your PC any time you need to measure your laser power or energy. No need to buy a separate meter!

■ USB LASER POWER OR ENERGY METER



## BLU

Our thermal power detectors (UP and HP series) are available in their BLU version, which allows you to read your power measurement directly on your mobile phone or PC thanks to Bluetooth connectivity.

You get the same high accuracy measurements without the need to connect any wires or to carry a separate acquisition & readout device. This solution is not only more practical, but also more economical compared to our other laser power measurement systems.

■ WIRELESS LASER POWER METER

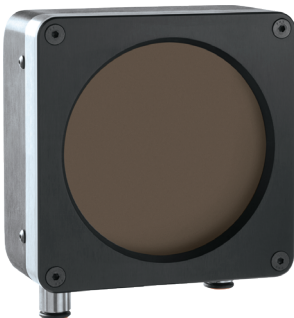


## PRONTO

Our PRONTO series is of high interest for those who need a laser measurement system that is portable and compact. These products can be handheld (for low power only) or placed on a stand like our standard detectors.

These user-friendly products are so simple to use that anyone can start using them within seconds. They all offer data logging on their internal memory. Data can then be transferred to your PC via USB.

■ PORTABLE, ALL-IN-ONE LASER POWER METERS



## HP

Our HP series of high power detectors include internal signal processing and two data output options: USB to read and log measurements with your computer, or DB15 to use a Gentec-EO display such as MAESTRO.

If you prefer going wireless, the HP detectors are also available with the BLU option.

■ ALL-IN-ONE SOLUTIONS FOR HIGH POWER MEASUREMENT



# TERAHERTZ DETECTORS

Room-temperature operated radiometers and joulemeters

We have designed a unique line of thermal sensors and meters for measurements in the THz region. These products are used to measure power (radiant flux or irradiance) and energy of CW, pulsed and quasi-CW THz sources from 30 THz to 0.1 THz. Our product line includes the QS series of miniature pyroelectric detector hybrids that include an operational amplifier and can be easily integrated into THz instrumentation.



## T-Rad

### THZ-B DETECTORS, WITH T-RAD RADIOMETERS

- Large area: 5 mm and 9 mm  $\varnothing$
- Wide dynamic range: 10 nW to 20 mW
- Broad spectral response with BL coating: 0.1  $\mu\text{m}$  to 3000  $\mu\text{m}$
- Two output options:
  - "DZ" models used with our digital T-RAD lock-in radiometer, for USB output to PC. Includes a powerful standalone LabVIEW software.
  - "DA" models used with our T-RAD-ANALOG power supply, for analog BNC output to your oscilloscope or lock-in amplifier.

■ CHOICE OF ANALOG OR DIGITAL OUTPUT

### THZ5I-BNC: ANALOG RADIOMETER & JOULEMETER



- Very sensitive pyroelectric radiometer and joulemeter
- 5 mm  $\varnothing$  detector with BL broadband absorber
- Wide dynamic range: 10 nW to 63  $\mu\text{W}$  and 10 nJ to 2  $\mu\text{J}$
- Analog BNC output to your oscilloscope or lock-in amplifier

■ CAN BE USED BOTH FOR POWER AND ENERGY MEASUREMENTS

### THZ-D: POWER DETECTORS FOR USE WITH GENTEC-EO METERS

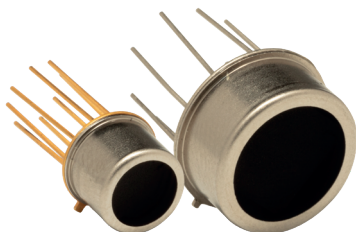


Available with  
*integra*

- THZ12D-3S-VP:
  - Large area: 12 mm  $\varnothing$
  - Wide dynamic range: 0.1 mW to 3 W
  - Spectrally flat ( $\pm 5\%$ ) from 30 THz to 0.7 THz
- THZ9D-20mS-BL:
  - Large area: 9 mm  $\varnothing$
  - High sensitivity: 500 nW to 20 mW
  - Spectral correction factors provided from 0.25  $\mu\text{m}$  to 3000  $\mu\text{m}$

■ COMPATIBLE WITH OUR STANDARD DISPLAYS & PC INTERFACES

### QS-THZ: MINIATURE HYBRID PYROELECTRIC DETECTORS



- Standard sizes: 5 and 9 mm  $\varnothing$  active area (other sizes available)
- Wide dynamic range: nW to mW and nJ to mJ
- Broad spectral response with BL coating: 0.1  $\mu\text{m}$  to 3000  $\mu\text{m}$
- Small packages: TO5 & TO8
- Includes integrated operational amplifier

■ TRY THEM WITH OUR EVALUATION TEST BOX QS-I-TEST

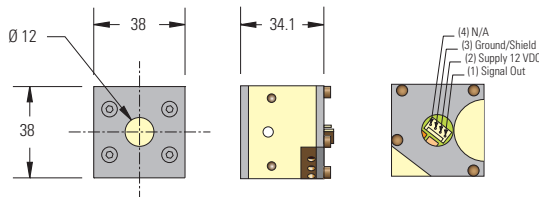
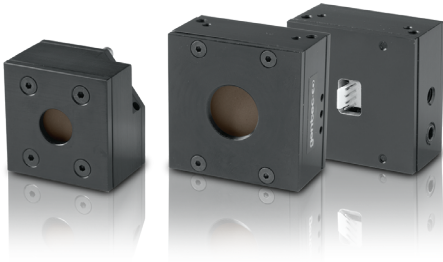
# CUSTOM / OEM PRODUCTS

Custom-built to your requirements

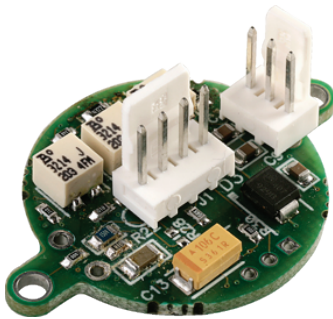
Gentec-EO offers OEM customers the highest flexibility so that you make no compromise. Whether you want a different housing, a specific sensitivity or another output connector, we have a solution for you. We will customize existing models or design a whole new detector to meet your needs.

## COMPACTNESS

As an OEM, we know space is often a constraint. This is why we offer very compact detectors to ease the integration inside machines. Users can mix and match existing detectors and cooling modules from a large set of combinations.



## PERFORMANCE



### Anticipation

0-95 % of the signal in as quickly as 0.3 s with the small UD12-70-H5 and in 0.6 s with the UD19-150-H5 using our external PCB.

### Amplification

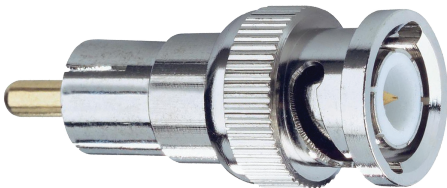
Adjust your disk sensitivity to get the perfect voltage for your acquisition system. Disks can be adjusted from 0.01 V/W up to 10 V/W depending on the model.

### Filtering

Eliminate the high frequency noise coming from the environment with the integrated low-pass filter of our PCB.

## CONNECTIVITY

Gentec-EO offers you several types of output connectors, from the more standard DB15, BNC and Molex to any exotic type you may need.



### DB15

This connector contains an EEPROM with custom calibration data for both power and energy detectors.

### BNC

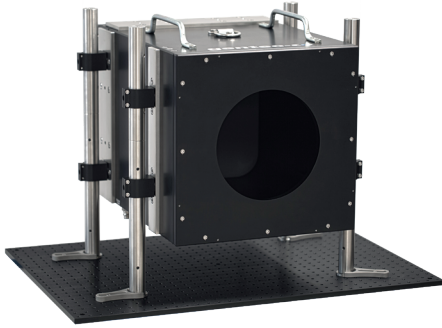
The BNC output gives you fast, easy installation and direct connection to an oscilloscope

### Molex or bare wires

The internal PCB gives an amplified signal output that can be accessed via a Molex connector and cable or bare wires. It is convenient for integrated systems.

# CUSTOM DESIGN EXAMPLES

Designed for your measurement needs

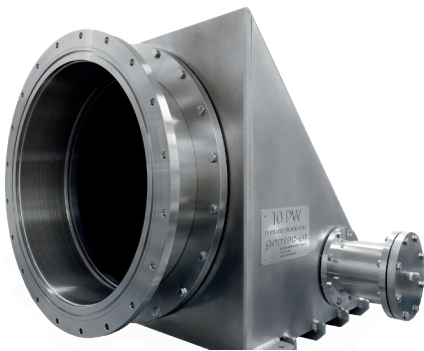


## EXTREMELY HIGH POWER, LOW BACK-REFLECTIONS

When working at extremely high average power, even a low % of back-reflections can be dangerous. To manage the back-reflections and provide a safer working environment, we can equip your high-power detector with a water-cooled "TUBE" extension.

This custom project example can measure up to 100 kW of average power continuously, and less than 4 % of the incident radiation is backscattered.

- CUSTOM-DESIGNED HIGH-POWER DETECTOR

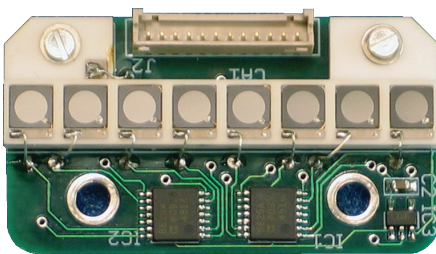


## "10 PW PORTABLE BLACK HOLE"

Gentec-EO is the only supplier able to manufacture beam dumps able to withstand the tremendous peak power of a 10-petawatt laser, in a high vacuum environment.

By working closely with our client, we have designed the only existing beam dump that can fulfill the task of capturing and dissipating the energy contained in the single pulses of the ELI-NP end-of-line laser beams. Furthermore, this product was designed to be operated without external cooling, which simplifies its installation and makes it usable in a wide range of applications.

- UNRIVALED DAMAGE THRESHOLDS: UP TO 200 J/CM<sup>2</sup> FOR fs PULSES
- EXTREMELY LOW BACK-REFLECTIONS: < 0.02 %

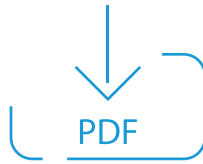


## 8-CHANNEL ARRAY FOR THZ TOMOGRAPHY

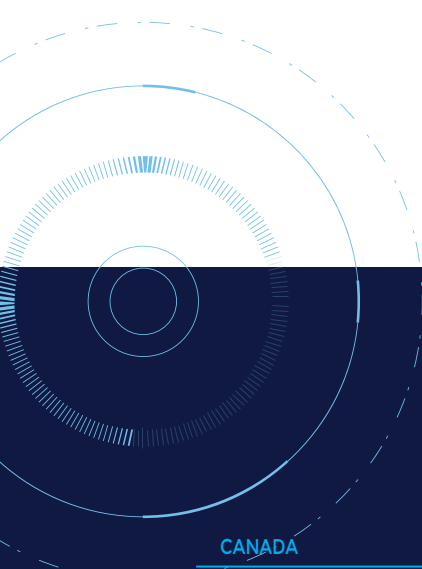
This eight-element, pyroelectric detector array was designed for use in a THz tomography system. It was used to analyze high pressure flames by measuring absorption in the water spectral bands, using THz radiation in the 0.5 to 2 THz region.

The detector elements are 3 mm diameter, accurately spaced on 5 mm centers. Its high responsivity and very low noise level allow precise detection of weak signals.

- 8-CHANNEL PYROELECTRIC ARRAY
- 0.5 TO 2 THZ RANGE
- HIGH VOLTAGE RESPONSIVITY



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PRODUCT GUIDE:  
[WWW.GENTEC-EO.COM](http://WWW.GENTEC-EO.COM)



# LEADER IN LASER BEAM MEASUREMENT **SINCE 1972**

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