gentec-eo

LASER COMPONENTS®

QUAD

Position sensing power & energy detectors

KEY FEATURES

- **MEASURE, TRACK AND ALIGN**
  With µm resolution in real time!
- **4-CHANNEL DETECTORS**
  Unique pyrolectric QUADrant detector technology handles high peak power without saturation
- **FOR CW, PULSED AND HIGH REP RATE LASERS**
  - QUAD-E: Energy per pulse from µJ to mJ
  - QUAD-P: Powers from µW to mW
- **FROM UV TO FIR AND THZ**
  Broadband detectors cover the full spectrum, from UV to Sub-Millimeter wavelengths
- **LARGE AREA SENSORS**
  9 mm and 20 mm square detectors
- **INCLUDES APPLICATION SOFTWARE**
  Complete LabVIEW application software included, with many features

COMPATIBLE DISPLAYS & PC INTERFACES

QUAD-4Track module

COMPATIBLE DISPLAYS & PC INTERFACES

ACCESSORIES

Stand with delrin post

Additional 9V power supply

USB cable

SDC-500 Découpeur optique numérique (pour -P)

Malette de transport Pelican

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	QUAD-9-MT-E	QUAD-9-MT-P	QUAD-20-MT-E	QUAD-20-MT-P
MAX ENERGY / AVG POWER	20 mJ	200 mW	20 mJ	200 mW
MAX POSITION RESOLUTION	1 µm	10 µm	1 µm	10 µm
EFFECTIVE APERTURE	9 x 9 mm	9 x 9 mm	20 x 20 mm	20 x 20 mm
MEASUREMENT CAPABILITY				
Spectral range	0.1 - 3000 µm	0.1 - 3000 µm	0.1 - 3000 µm	0.1 - 3000 µm
Min beam size [a]	≥ 4.5 mm Ø	≥ 4.5 mm Ø	≥ 10 mm Ø	≥ 10 mm Ø
Position resolution with QUAD-4TRACK	1 µm	10 µm	1 µm	10 µm
Maximum measurable energy/power	20 mJ/channel	200 mW	20 mJ/channel	200 mW
Noise equivalent energy/power	0.5 µJ	1 µW	1.0 µJ	2 µW
Rise time (typical 0-100%)	150 µs	< 0.02 s	150 µs	< 0.02 s
Max repetition rate	1000 Hz	N/A	1000 Hz	N/A
Maximum pulse width	2.5 µs	N/A	2.5 µs	N/A
Maximum chopping frequency	N/A	50 Hz	N/A	50 Hz
Sensitivity	1000 V/J	2000 V/W	1000 V/J	2000 V/W
DAMAGE THRESHOLDS				
Max average power density (at 1064 nm)	100 mW/cm²	100 mW/cm²	100 mW/cm²	100 mW/cm²
Max energy density (at 1064 nm 10 ns)	50 mJ/cm²	50 mJ/cm²	50 mJ/cm²	50 mJ/cm²
PHYSICAL CHARACTERISTICS				
Effective aperture	9 x 9 mm	9 x 9 mm	20 x 20 mm	20 x 20 mm
Sensor type	Pyroelectric	Pyroelectric	Pyroelectric	Pyroelectric
Absorber	MT	MT	MT	MT
Dimensions	63.5Ø X 40.6D mm	63.5Ø X 40.6D mm	63.5Ø X 40.6D mm	63.5Ø X 40.6D mm
Weight	181 g	181 g	181 g	181 g
ORDERING INFORMATION				
Compatible stand	STAND-D-233	STAND-D-233	STAND-D-233	STAND-D-233
Product page				

a. For optimal performance.

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QUAD-4TRACK

The QUAD-4Track is a laser position sensing system designed to support our unique pyroelectric quadrant detectors, QUAD-P and QUAD-E. It is a 4-channel microprocessor-based system that measures the voltage output of each QUAD element and does the math necessary to provide a measurement of the X and Y displacement of a laser beam or image. It is fast and can be used to track, align and/or measure movement in real time, with a resolution of just a few microns!

QUAD-4Track (front view)

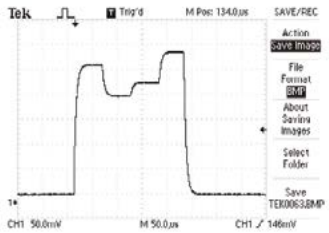
QUAD-4Track (rear view)

SPECIFICATIONS & FEATURES

QUAD-4TRACK	
Number of channels	4
Full scale ranges (4 decades) (E / P)	
Energy mode (with QUAD-E)	20 µJ to 20 mJ
Power mode (with QUAD-P)	200 µW to 200 mW
USB connection to computer	YES (USB 2.0 full speed)
Power supply	9 VDC
Power on light	YES
Detector input	DB-25 connector
Detector analog output	BNC connector (0 - 2 V)
Trigger input (TTL)	BNC connector with LED indicator
Product number	201517

QUAD DETECTORS

Our large area pyroelectric quadrant detectors provide unique advantages over other position sensing detectors like silicon quads or lateral effect photodiodes. They are fast, handle high peak power of pulsed lasers without saturation and respond to lasers across the spectrum, from UV to Far IR and even THz. The QUAD-E is intended for use with pulsed sources at up to 1000 Hz, while the QUAD-P is designed for CW and High Repetition Rate (Quasi-CW) sources. Both types of detectors can also be used as standalone units, in an analog mode, for incorporation into your own system application. We can provide a Lemo cable for this purpose.



ANALOG OUTPUT

The analog output of the QUAD-4Track provides voltage that is directly proportional to the pulse energy or laser power irradiating each QUAD element. When the four voltage outputs are equal, the beam is centered on the QUAD detector. This provides a very useful tool when setting up our QUAD probes with your source for optical alignment.

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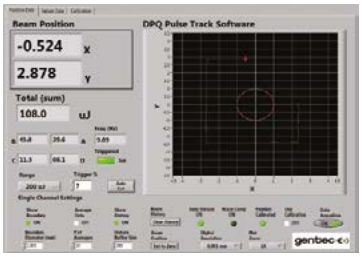
QUAD

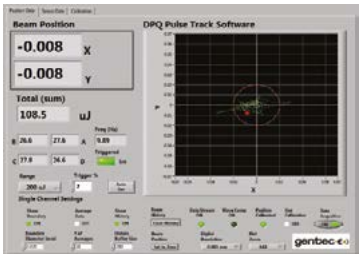
CE NIST* Traceable

*Also traceable to NRC-CNRC



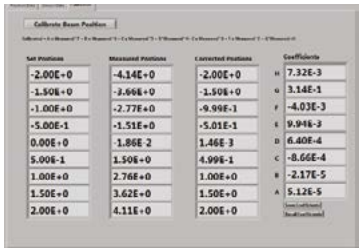
MEASUREMENT SCREEN

QUAD-4Track includes powerful, stand alone, LabVIEW software which is used to control the instrument, process the data, and display X and Y position. It also displays the energy or power of your source and repetition rate. The large graphic in this screen shows the position of the centroid of the beam and tracks its movement in real time. The software includes many handy features like: set boundary, zoom (2X to 128X), set resolution, data logging, and many more. The green line represents the tracking history.



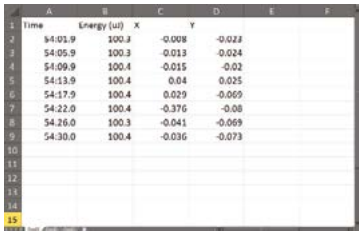
TRACKING THE BEAM OVER TIME

In the measurement screen shown on the left, we are tracking the beam stability of a pulsed Nd:YLF laser at 10 Hz. The resolution was set at 0.001 µm, the boundary is at 20 µm (red circle), and the zoom feature is at 64X. The total energy is 108.5 µJ, the final position of the laser is at -8 µm in X and -8 µm in Y. The green tracking line shows the movement of the laser about the zero position over a few hundred pulses.



POSITION CALIBRATION SCREEN

We've developed a unique position calibration routine which allows you to calibrate our QUAD-4Track system when working with a uniformly round laser beam. It requires the use of a micrometer-driven linear stage (1-axis only). As you can see from the calibration screen on the left, the procedure involves zeroing the instrument, moving the QUAD probe to nine discrete positions (+2.000 to -2.000 mm) and then capturing the QUAD readings. It then determines correction coefficients (last column) and applies them to the raw data to arrive at "corrected positions". The QUAD probe is now calibrated!



DATA LOGGING

Another very handy feature is "data logging". This allows you to set up the QUAD-4Track to follow the displacement, energy and/or power of your laser over several minutes, hours or even days. Need to measure the "beam steering" of your laser as it warms up? This is how you do it! Need to measure the beam displacement vs laser repetition rate or energy level? Data logging will help you measure it!

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