gRAY

Laser Power Detectors

greenTEG

For fast and accurate measurements

gRAY
Thermal Laser Power Detectors

Power Monitoring & Key-Features

Laser power monitoring is crucial in ensuring the optimal operation of your laser system.

Our laser power detectors measure in real time and provide you with accurate data. By delivering information about the laser power, the gRAY detectors allow you to monitor and control your laser system. Since all gRAY modules are based on thermal sensors, they detect radiation power independent of the laser wavelength.

The benefits of all gRAY detectors are

- Large spectral range (UV to MIR)
- Fast response time
- Compact design

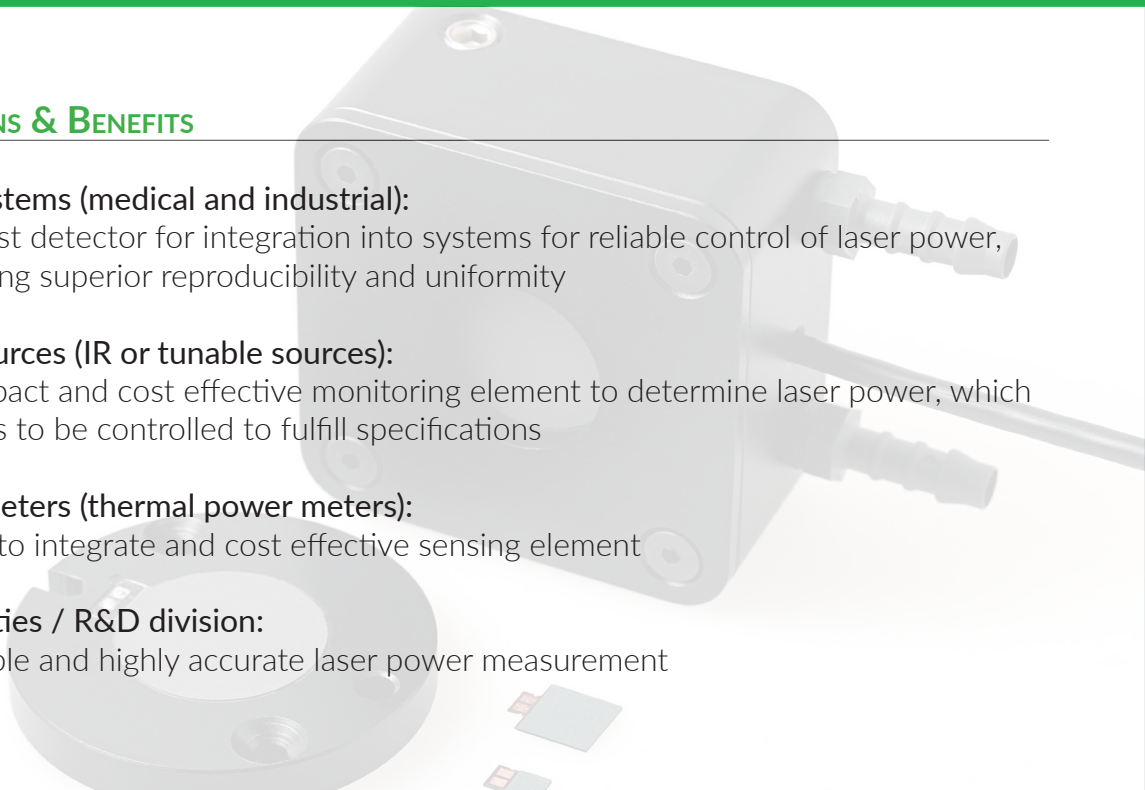
Applications & Benefits

- **Laser systems (medical and industrial):**
  Robust detector for integration into systems for reliable control of laser power, yielding superior reproducibility and uniformity

- **Laser sources (IR or tunable sources):**
  Compact and cost effective monitoring element to determine laser power, which needs to be controlled to fulfill specifications

- **Power meters (thermal power meters):**
  Easy to integrate and cost effective sensing element

- **Universities / R&D division:**
  Flexible and highly accurate laser power measurement



NEW

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New Products 2016

Digital Output & Temperature Compensation

Digital signal processing is standard in modern applications requiring analog-to-digital conversions for analog sensor outputs. However, with our new detector, you can process the digital output signals directly without an additional conversion step.
This makes it easier for you to integrate our sensors.

When introducing this new feature, we took the opportunity to eliminate one of the issues that all thermopile detectors exhibit - the temperature dependence of the output signal.
With this new generation of gRAY detectors, all temperature drifts are compensated.

Talk to us to find out which detector is available with digital and T-compensated signal.

Ultra Small Thermopile & Position Detector

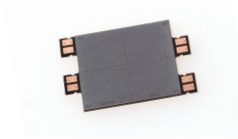
The quality requirements for laser sources increase constantly. Further, wavelengths in the MIR or emission at several wavelengths are not unusual for laser sources. In these applications, photodiodes reach their limits as power monitors.

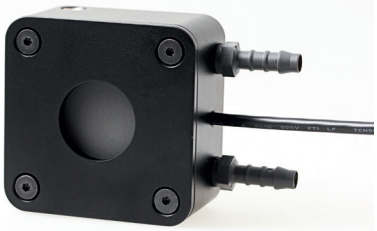
We have the developed a **miniature thermopile detector that saves space and measures power accurately at all wavelengths**.

The exact positioning of the laser beam is crucial for the reproducibility of any laser process. **With our new thermopile position detector, you can center your laser beam with an accuracy of 50 µm or better**.

gRAY Overview

	Product Name	Power Range	Aperture Size	Application
Housed Detectors	**C05-HC**	5 mW to 5 W	Ø 25 mm	Laser systems/standalone
	**C10-HC**	10 mW to 10 W	Ø 25 mm	Laser systems/standalone
	C50-HW	50 mW to 50 W	Ø 25 mm	Laser systems/standalone
	C100-HW	100 mW to 100 W	Ø 25 mm	Laser systems/standalone
Mounted Detectors	**C50-MC**	50 mW to 50 W	Ø 26 mm	Laser systems/power meters
	**B05-MC**	10 µW to 5 W	10 x 10 mm^2	Laser systems/power meters /standalone
	B01-SMC	100 µW to 1 W	4.4 x 4.4 mm^2	Laser sources/laser systems /power meters
	B05-SMC	100 µW to 5 W	10 x 10 mm^2	Laser sources/laser systems /power meter

	Product Name	Power Range	Aperture Size	Application
Bare Die Components	**B0.5-SC**	100 µW to 0.5W	2 x 2 mm^2	Laser sources
	**B01-SC**	100 µW to 1 W	4.4 x 4.4 mm^2	Laser sources/laser systems /power meters
	B05-SC	100 µW to 5 W	10 x 10 mm^2	Laser sources/laser systems /power meter
Position Detectors	**B05-PC**	1 mW to 5 W	18 x 18 mm^2	Laser systems/position meters
	**C50-PC**	100 mW to 30 W	18 x 18 mm^2	Laser systems/position meters



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Housed Detectors

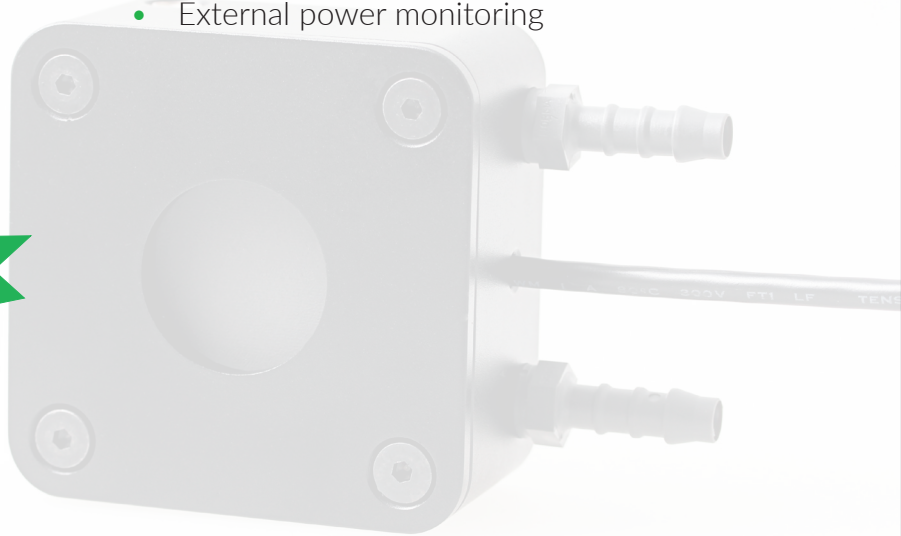
Key Features

- Absolute power sensing of laser beams up to 100 W
- 300 ms rise time
- Full electrical and thermal integration provided
- Robust design for system integration or standalone applications
- **Digital output signal (I2C)**
- **Temperature compensated signal**

NEW

Application

- Integration into laser systems
- External power monitoring



Product Name	C05-HC(T)	C10-HC(T)	C50-HW(T)	C100-HW(T)
Sensing Area (Ø) [mm]	25	25	25	25
Max. Power [W]	5	10	50	100
Min. Detectable Power [mW]	5	10	50	100
Response Time (0 - 95%) [s]	0.2	0.2	0.2	0.2
Max. Power Density [kW/cm^2]	1.5	1.5	1.5	1.5
Spectral Range [µm]	0.19 - 15	0.19 - 15	0.19 - 15	0.19 - 15
Sensitivity [mV/W]	2000	1000	200	100
Cooling Method	conduction, convection	conduction, convection	water cooling	water cooling
Signal Output	analog/digital	analog/digital	analog/digital	analog/digital

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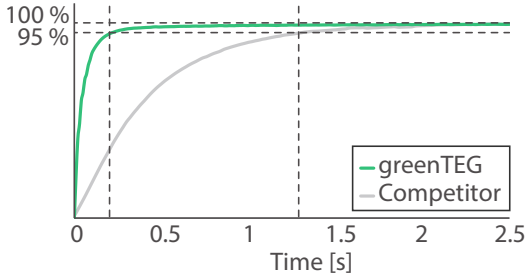
Mounted High Power Detector

Key Features

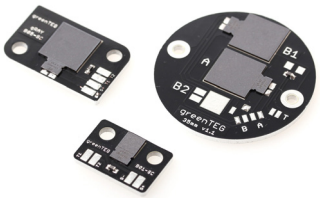
- Absolute power sensing of laser beams up to 100 W
- 300 ms rise time
- Compact design for versatile system integration
- Optional: Amplification circuit board for electrical integration

Application

- Integration into power meters
- Integration into laser systems



Product Name	C50-MC
Sensing Area (Ø) [mm]	26
Max. Power [W]	50 (100 with active cooling)
Min. Detectable Power [mW]	50
Response Time (0 - 95%) [s]	0.2
Max. Power Density [kW/cm^2]	1.5
Spectral Range [µm]	0.19 - 15
Min. Sensitivity [mV/W]	0.5
Cooling Method	conduction, convection
Amplification board	optional



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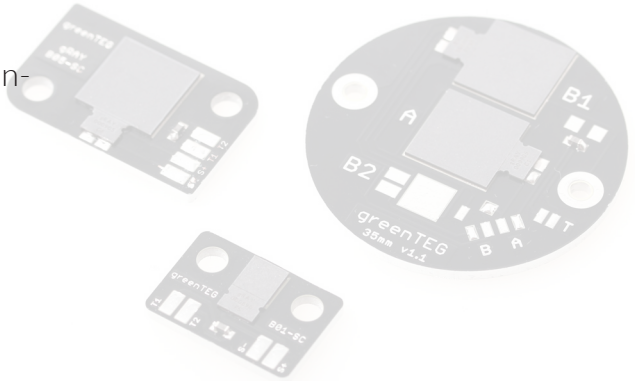
Mounted Detectors

Key Features

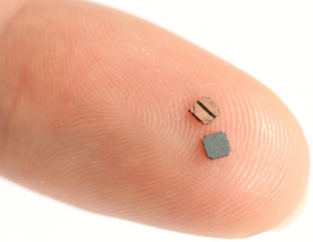
- Mounted on a metal-core PCB; no thermal integration needed
- 10 µW to 5 W power range
- Simple, compact and robust mounting
- Integrated NTC
- Optional: thermal background compensation
- Available with NIST/PTB traceable calibration

Application

- Integration into power meters
- Integration into laser systems
- External power monitoring



Product Name	B05-MC	B01-SMC	B05-SMC
Sensing Area [mm x mm]	10.0 x 10.0	4.4 x 4.4	10.0 x 10.0
Max. Power [W]	5	1	5
Min. Detectable Power [µW]	10	100	100
Response Time (0 - 95%) [s]	1.5	1.5	1.5
Max. Power Density [kW/cm^2]	1.5	1.5	1.5
Spectral Range [µm]	0.19 - 15	0.19 - 15	0.19 - 15
Min. Sensitivity [mV/W]	70	40	70
Cooling Method	conduction, convection	conduction, convection	conduction, convection
Signal Output	analog/digital	analog/digital	analog/digital



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Bare Die Components

Key Features

- 100 µW to 5 W power range
- Linear power response
- Signal independent of illumination angle
- Ultra-thin design
- Simple integration on PCBs
- Attractive OEM pricing
- Various sizes available (2 x 2 to 10 x 10 mm^2)

Application

- Integration into power meters
- Integration into laser sources and systems

Product Name	B0.5-SC	B01-SC	B05-SC
Sensing Area [mm x mm]	2.0 x 2.0	4.4 x 4.4	10.0 x 10.0
Max. Power [W]	0.5	1	5
Min. Detectable Power [µW]	100	100	100
Response Time (0 - 95%) [s]	2.1	2.1	2.1
Max. Power Density [kW/cm^2]	1.5	1.5	1.5
Spectral Range [µm]	0.19 - 15	0.19 - 15	0.19 - 15
Min. Sensitivity [mV/W]	80	70	70
Cooling Method	conduction, convection	conduction, convection	conduction, convection

NEW

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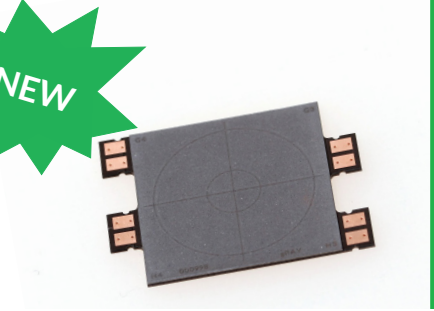

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Position Sensitive Devices

Key Features

- Position sensing of laser beams
- Highly sensitive thermopile sensor
- Sensitive to all wavelengths from UV to MIR
- Wide power range from µW to W
- Signal independent of illumination angle
- Ultra-thin design
- Compact and robust design for system integration

Application

- Integration into power/position meters
- Integration into laser systems

Product Name	B05-PC	C50-PC
Sensing Area [mm x mm]	18.0 x 18.0	18.0 x 18.0
Max. Power [W]	5	30
Min. Detectable Power [mW]	1	100
Spatial resolution [µm]	30	50
Response Time (0 - 95%) [s]	2.1	0.2
Max. Power Density [kW/cm^2]	1.5	1.5
Spectral Range [µm]	0.19 - 15	0.19 - 15
Min. Sensitivity [mV/W]	80	0.5
Cooling Method	conduction, convection	conduction, convection

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Company Overview

We Offer

With our thermal laser power detectors, we provide you with fast and accurate power monitoring devices. Integrating these into your system will supply you and your customers with a key parameter that will enable more reliable system operation.

You will benefit from working with us through

- Laser power detectors with unique technical features
- Know-how of thermal and electronic integration of thermal power detectors into applications
- Partnerships with OEMs, system integrators and distributors for bringing new products to market
- Development of customized sensors and systems for OEM customers

Contact us and tell us about your application ideas. We will support you in finding the best solution for your requirements.

About

greenTEG develops, manufactures and markets thermal sensor solutions. The company was founded in 2009 as an ETH Zurich spin-off and has since built up an international customer base, coupled with a global distributor network.

greenTEG's thermal sensors are integrated into diverse applications by customers active in markets such as laser, building technologies, medtech, automotive, processing industry and R&D.

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