PT-9610 Hand-held Laser Qualification Meter

- © **Hand-held Single Channel Laser Qualification Meter for**
  - **Laser Power Measurement**
    - * **Wavelength Range 350 to 1100 nm**
    - * **Measurement Range up to 90 mW**
  - **Effective and Peak Noise Value Analysis**
    - * **Effective Values with Wide Band, Low and High Frequency Selection**
    - * **Peak Values with Positive, Negative and Peak to Peak Selection**
- © **Service and Production Use**
- © **Handheld Portable Meter**
- © **Battery or AC Operation**

Laser Qualification
In most applications knowing the radiant power of a laser is the only qualifying parameter. That's why laser power meters are one of the most common instruments found in the lab and field service. But for specific applications, other parameters of the laser are also of interest.

Laser Noise
In laser use where measurement resolution is limited by the noise level of the laser radiation, the qualification of the noise level and noise function become important.
One example of this involves laser imaging scanners. The extremely high measurement bandwidth of these systems does not allow limiting the bandwidth of the detection system. Because of this not only laser power but to a greater extent the noise level and noise characteristic of the laser, used as a light source, influences the signal to noise ratio. So both laser power and noise must be qualified in incoming inspection, final testing and service.

PT-9610 Laser Qualification Meter
Gigahertz-Optik developed the PT-9610 in close cooperation with the laser industry.
The idea was to develop a simple mobile meter for applications where laser power plus it's time structure in the form of modulation needs to be determined in the same measurement procedure. This information was of interest because any short and long term changes in intensity would effect the resolution of the measurement procedure.

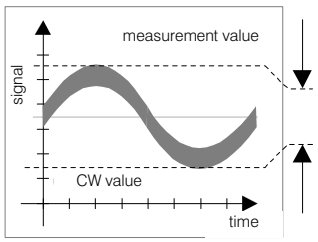
Functional Description
The PT-9610 operates in two basic modes. CW power is always measured, i.e. the average power together with the component of the power with which the power oscillates about the mean value (modulation component).
Measurement mode of the modulation component can be selected for a more precise evaluation. The modulation component can be displayed as power ("absolute power, e.g. in W") or as a relative value related to the CW power.
A description of evaluation modes and display selections is summarized in the table shown on this page.
The device is also equipped with an analog output where the signal measured after the preamplifier is made available. The conversion factor between the detector signal and the output signal is between 10^3 V/A and 10^5 V/A, depending on the range of measurement. The output impedance is 10 kΩ.

PD-1 Detector Head
The PD-1 is supplied as part of the PT-9610 system. It can handle a dynamic range of laser power from 1 µW up to 90 mW (647 nm). This means that noise analysis using the maximum bandwidth of 1 MHz in the "RMS" or "Peak" modes has a resolution of 0.1% in the power range >1 mW. The detector head can be used for lasers in the wavelength range from 350 nm up to 1100 nm and offers a 5 mm diameter measurement aperture.

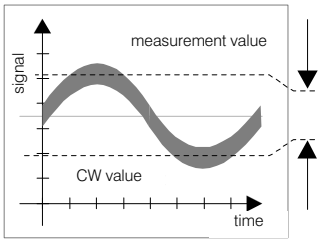
Traceable Calibration
Calibration of spectral sensitivity is traceable to the ISO EN 17025 accredited part of Gigahertz-Optik's Calibration Laboratory for Optical Radiation Quantities. The calibration is done in 10 nm steps within the wavelength range from 350 to 1100 nm. A plot of the spectral sensitivity is part of the calibration certificate.

Evaluation Modes

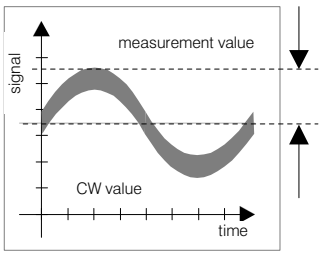
RMS WB
- r.m.s. value
- wide band



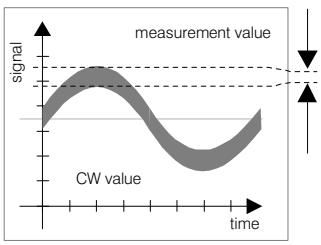
RMS LF
- r.m.s. value
- low frequency



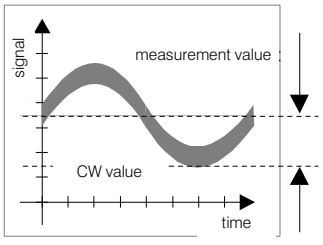
Peak +
- peak value
- positive



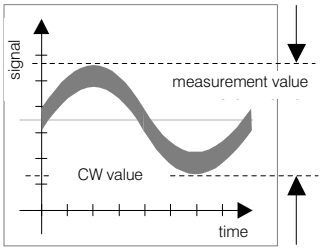
RMS HF
- r.m.s. value
- high frequency



Peak -
- peak value
- negative



Peak pp
- peak value
- peak to peak

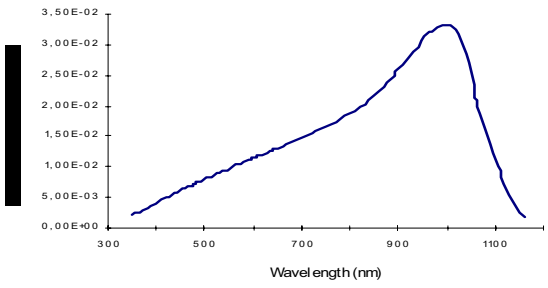


PT-9610 Specifications & Ordering Information

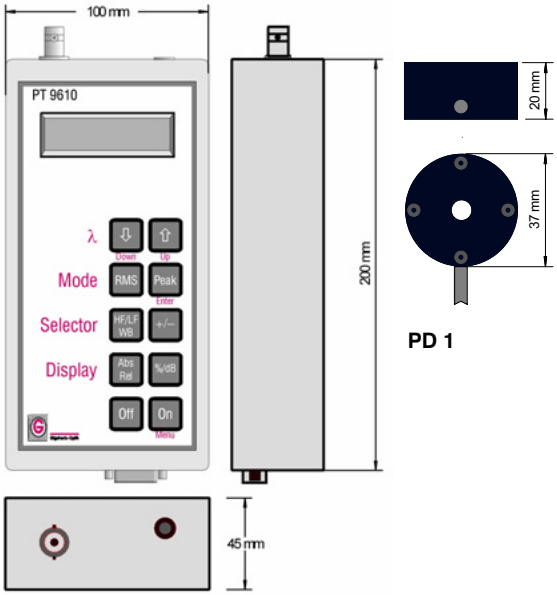
PT-9610 Specifications	
ADC resolution "CW + RMS":	0.025 % of the full scale range value
ADC resolution "Peak":	0.07 % of the full scale value (R1/WB)
	0.01 % of the full scale value (R1/LF)
	0.01 % of the full scale value (R2/WB)
	0.005 % of the full scale value (R2/WB)
Lower cut-off frequency for CW measurement:	10 Hz
Cut-off frequency in (-3 dB) mode:	500 kHz (R1), 1 MHz (R2 + R3)
Low pass filter in LF mode:	830 Hz (-3 dB) 480 Hz (-1.5 dB)
High pass filter in HF mode:	280 Hz (-3 dB) 480 Hz (-1.5 dB)
Calibration data storage:	External EEPROM in detector plug
Measuring ranges:	R1, R2 and R3 with manual or automatic range switching (menu function)
Operating panel:	Membrane keypad
Display:	LCD with switch able background illumination
Signal input:	9-pin SUB-D connector
Analog output:	BNC socket
Power supply:	Rechargeable battery or AC operation using external power supply unit (7.3 V/350 mA)
Dimensions:	Approx. 20 cm x 10 cm x 4.5 cm (8 in x 4 in x 1.8 in) (L x W x H)
Weight:	Approx. 500 g (1.1 lb) with batteries

PT-9610 with PD1 Specifications			
Limits of Measurement			
	R1	R2	R3
RMS WB	0.5 µW	1.5 µW	0.01 µW
HF	0.5 µW	1.5 µW	0.01 µW
LF	0.05 µW	0.3 µW	0.004 µW
Peak-Peak WB	2.5 µW	4 µW	0.02 µW
Max. Limits (637nm)			
CW	900 µW	9 mW	90 mW
Resolution	0.1 µW	1 µW	10 µW

PD-1 Spectral Sensitivity



Dimensions



PD 1

Ordering Information	
PT-9610-PD1	Laser power and laser noise analyzer including PD1 detector , handbook, calibration certificate and plug-in power supply
PD1	Laser power detector for use with PT-9610. Calibration data stored in calibration data connector. Calibration certificate.
BHO-01	Carrying case for PT-9610 with PD1 detector and accessories.