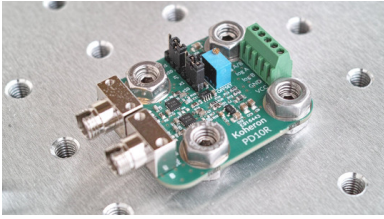


PD10R - Dual logarithmic photodetector



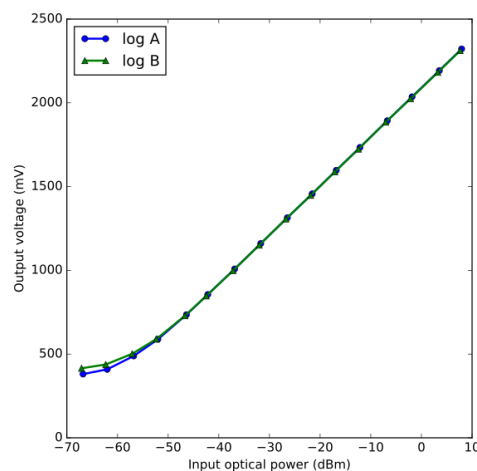
Koheron PD10R is a dual logarithmic photodetector for general purpose optical power measurements. In addition to two analog outputs $\log(A)$ and $\log(B)$, the PD10R gives the log-ratio $\log(A/B)$ with an adjustable offset and two gain settings (x1 and x10). The PD10R provides a fully-analog solution for direct absorption measurement in spectroscopy setups.

Specifications

	PD10R
Wavelength range	900 - 1700 nm
Optical power	-67 to 7 dBm (0 dBm = 1 mW)
Small signal bandwidth	1.2 MHz at 3 dB for optical power > -10 dBm / 100 μ W
Logarithmic slope	30 mV / dBm between -50 and 7 dBm
Supply voltage	3.3 - 15 V
Dimensions	38 mm x 53 mm x 12 mm

Characterization

The figure below shows the voltage measured on the two outputs $\log(A)$ and $\log(B)$ vs. the optical power incident on photodiodes A and B respectively. Optical power was generated with a 1550 nm DFB laser followed by a variable optical attenuator and measured with a Thorlabs PM100D / S155C power meter.

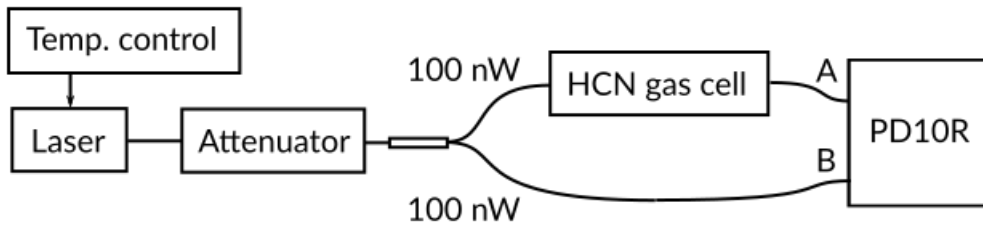


We observe a linear behavior between -50 dBm (10 nW) and 7 dBm (5mW).

Absorption measurement

The PD10R can perform accurate absorption measurements with small amounts of optical power. We used the setup below to observe the absorption lines of a HCN gas cell with 200 nW of total optical power. Optical source is a DFB laser whose temperature is increased linearly from 10 to 25 °C in 60 s. The absorption path and the reference path are

connected respectively to the A and B inputs of the PD10R.



The three outputs $\log(A)$, $\log(B)$ and $\log(A/B)$ have been recorded simultaneously during the 60 s temperature sweep. Intensity variation observed on the $\log(A)$ and $\log(B)$ channels are nicely rejected on the $\log(A/B)$ output. Numerical computation of $\log(A/B)$ from $\log(A)$ and $\log(B)$ is represented in the cyan curve.

