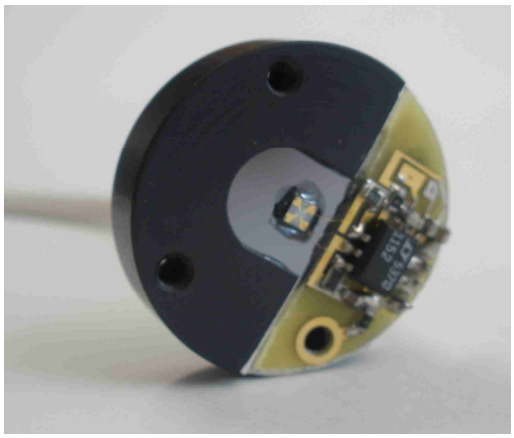
PCA- receiver on aspheric or hyperhemispherical silicon substrate lens with preamplifier

Data sheet PCA-l-g-w-λ-x-p

To use the high sensitivity of the receiver antenna and to avoid electromagnetic interference in the cable between the antenna and the signal amplifier, a small preamplifier on the printed circuit board on the antenna mount is direct contacted to the antenna chip.

PCA with preamplifier and power supply (here with additional aspheric focusing optical lens for free space laser excitation)

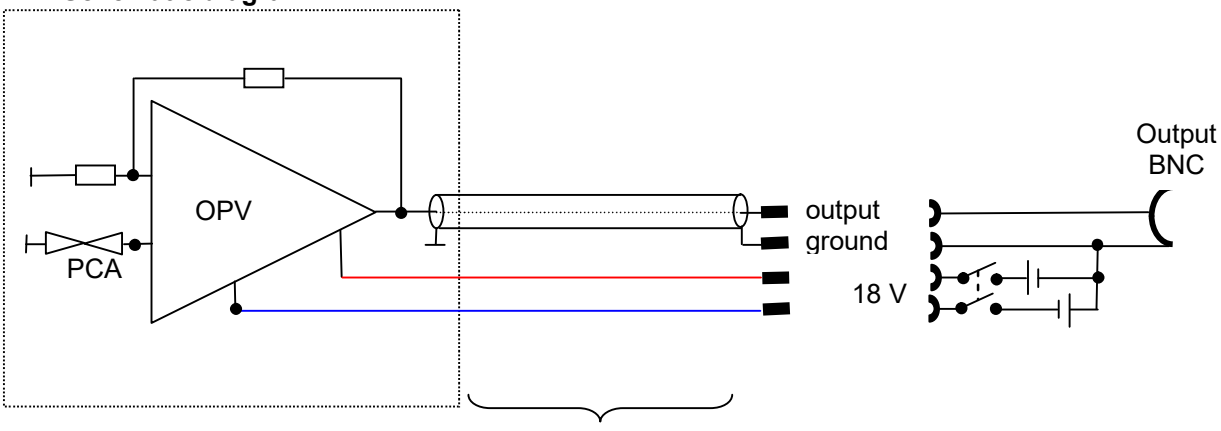


Front view on mounted PCA (laser side) with preamplifier

Non-inverting amplifier

Gain	20
input offset voltage	≤ 250 µV
input noise current	1.8 fA/√Hz (f = 1 kHz)
input noise voltage	30 nV/√Hz (f = 1 kHz)
minimum load resistance	1kΩ
supply voltage	18 V (+/- 9 V)

Schematic diagram

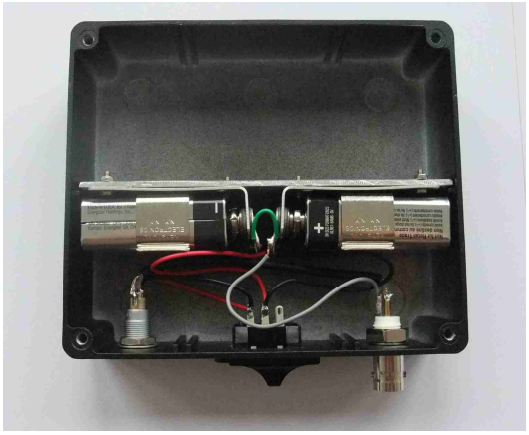


PCA with preamplifier | cable to power supply | connector | power supply

Power supply for preamplifier

Aluminium case dimensions	120 mm / 100 mm / 36 mm (l / w / h)
Weight	380 g
Input connector	LEMO FGG 0B 4pol.
Output signal connector	BNC

Front view of the power supply +/- 9 V
with connector type LEMO FGG 0B 4p, circuit breaker
and BNC output signal connector (from left to right)



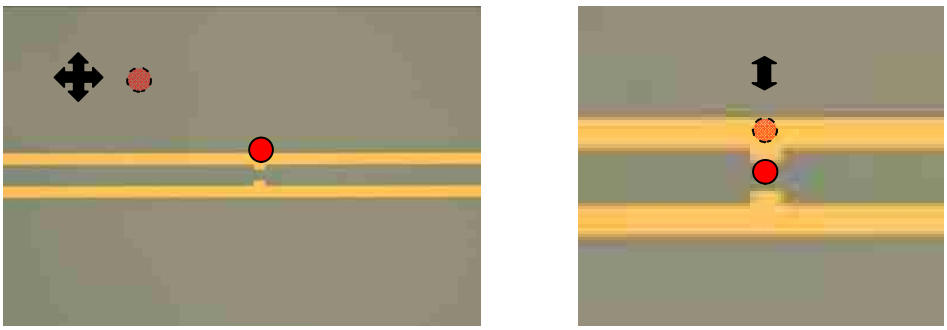
Opened power supply with two 9 V E-Blocks PP3

Laser beam adjustment

The best way to adjust the focussed laser spot on the antenna gap is to monitor the amplified output voltage of the antenna. If the PCA is illuminated not exactly at the center of the gap you will measure a photo voltage. The cause is the charge carriers which are biased at the metal-semiconductor transition. This voltage can be positive or negative depending on which side of the antenna is illuminated.

The first goal during the beam adjustment is to maximize this photo voltage. It ensures that the antenna is hit close to the gap with just a small displacement perpendicular to the antenna electrodes.

In the second step the beam has to be adjusted perpendicular to the parallel lines until the zero-crossing of the output voltage is reached. The center of the gap is hit at exactly this point where the photo voltage shows 0 V.



Beam Adjustment a) first step - maximize the photo voltage b) second step - finding the zero-crossing

Battery exchange

The power supply for the preamplifier is equipped with two batteries 9 V, type PP3. To exchange the battery the power supply must be opened. Using a screwdriver four recessed countersunk flat head screws M 3.5 has to be removed to open the case and to exchange the accumulators.