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.

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)
Power supply for preamplifier

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Aluminium case dimensions</td>
<td>120 mm / 100 mm / 36 mm (l / w / h)</td>
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<tr>
<td>Weight</td>
<td>380 g</td>
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<td>Input connector</td>
<td>LEMO FGG 0B 4pol.</td>
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<tr>
<td>Output signal connector</td>
<td>BNC</td>
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</table>

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.