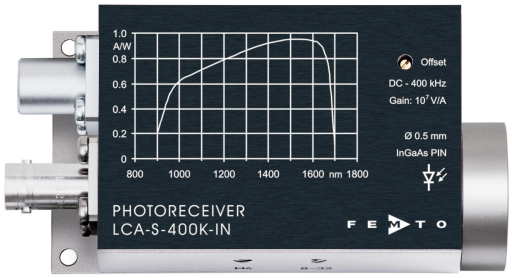
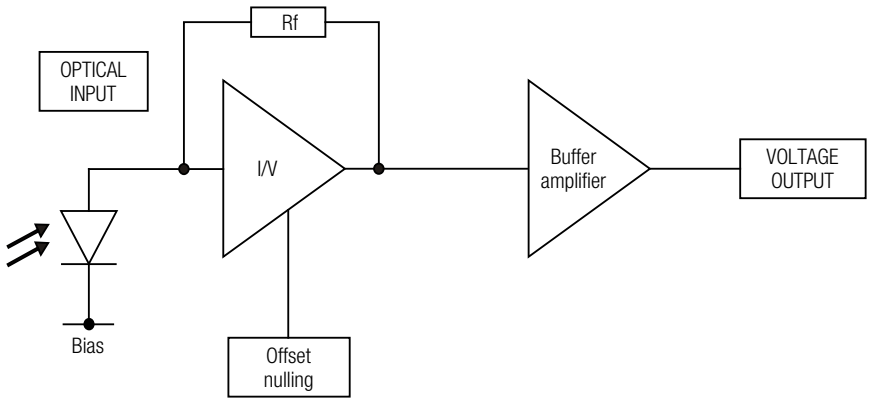
Low Noise 400 kHz Photoreceiver with InGaAs-PIN Photodiode



Features	• **InGaAs-PIN photodiode, 0.5 mm active diameter** • **Bandwidth DC – 400 kHz** • **Amplifier transimpedance gain 1.0 × 10^7 V/A** • **Max. conversion gain 9.5 × 10^6 V/W @ 1550 nm** • **Spectral range 900 – 1700 nm** • **Free-space input 1.035"-40 threaded, easily convertible to fiber optic input (FC and FSMA) with optionally available screw-on adapters** • **UNC 8-32 and M4 tapped holes for mounting on standard posts with metric and imperial thread**
Applications	• **NIR Spectroscopy** • **General purpose opto-electronic measurements** • **Optical front-end for oscilloscopes, A/D converters and lock-in amplifiers**
Block Diagram	 BS01-LCA-S_R01
Intended Use	The LCA-S-400K-IN photoreceiver consists of an InGaAs-PIN photodiode and a subsequent low-noise fixed gain transimpedance amplifier. It is designed for fast conversion of small optical signals into equivalent output voltages. Operation is mostly self-explanatory. If in doubt, consult this document or contact support@femto.de. For safe operation, please refer to the damage thresholds specified in the "Absolute Maximum Ratings", "Temperature Range" and “Power Supply” sections of this document. The operating environment must be free of smoke, dust, grease, oil, condensing moisture, and other contaminants that could affect the operation or performance.

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Available Version	LCA-S-400K-IN-FST 	1.035"-40 threaded flange with internally threaded coupler ring (outer diameter 30 mm) for free space applications, compatible with many optical standard accessories Optionally available: Fiber adapters PRA-FC, PRA-FCA and PRA-FSMA, with the relative large 0.5 mm dia. photodiode installed in the LCA-S-400K-IN input coupling is not critical, however, standard SM 9/125 fibers (PC or APC) with low numerical aperture (NA) are recommended for ensuring near 100% coupling efficiency
Related Model	LCA-S-400K-SI-FST	Si-PIN, ∅ 3 mm, 320 - 1060 nm free space input, 1.035"-40 threaded flange
Available Accessories	PRA-FC PRA-FCA PRA-FSMA 	Fiber-adapter with external 1.035"-40 thread (suitable for FST models only)
	PRA-PAP 	Alternative mounting option: post adapter plate, easy to mount on FEMTO photoreceiver series OE, FWPR, PWPR, HCA-S and LCA-S
	PS-15-25-L 	Power Supply input: 100 – 240 VAC output: ±15 VDC

Specifications	Test conditions	V_S = ±15 V, T_A = 25 °C, output load impedance 1 MΩ, warm-up 20 minutes (min. 10 minutes recommended)
Gain	Transimpedance gain	1.0×10^7 V/A (@ output load ≥ 100 kΩ)
	Gain accuracy	±1 % (electrical)
	Conversion gain	9.5×10^6 V/W typ. (@ 1550 nm, output load ≥ 100 kΩ)
Frequency Response	Lower cut-off frequency	DC
	Upper cut-off frequency (–3 dB)	400 kHz
	Gain flatness	±0.5 dB
Time Response	Rise/fall time (10 % – 90 %)	1 µs
Input	Noise equivalent power (NEP)	75 fW/√Hz (@ 1550 nm, 10 kHz)
	Optical saturation power	1 µW (for linear amplification, @ 1550 nm)
	Input offset compensation range	±300 nA, adjustable by offset potentiometer
Detector	Detector	InGaAs-PIN photodiode
	Active area	∅ 0.5 mm
	Spectral range	900 – 1700 nm
	Max. sensitivity	0.95 A/W typ. (@ 1550 nm)

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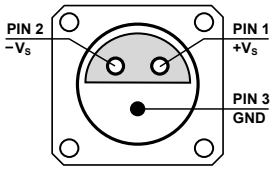
Specifications (continued)		
Output	Output voltage range	–3 V ... +10 V (@ ≥ 100 kΩ output load)
	Output impedance	50 Ω (terminate with ≥ 100 kΩ load)
	Max. output current	30 mA (short-circuit proof)
	Output noise	2 mV RMS (12 mV peak-peak) typ. (@ ≥ 100 kΩ load, no signal on detector, measurement bandwidth 1 MHz)
Optical Input Connector	Material FST flange	1.4305 stainless steel, nickel-plated
	Material FST coupler ring	1.4305 stainless steel, glass bead blasted
Power Supply	Supply voltage	±15 V (±14.5 V ... ±16.5 V)
	Supply current	±40 mA (depends on operating conditions, recommended power supply capability min. ±150 mA)
Case	Weight	212 g (0.47 lbs) LCA-S-400K-IN-FST incl. coupler ring
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage temperature	–30 °C ... +85 °C
	Operating temperature	0 °C ... +60 °C
Absolute Maximum Ratings	Optical input power (CW)	10 mW
	Power supply voltage	±20 V
Connectors	Input	1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories
	Output	BNC jack (female)
	Power supply	LEMO® series 1S, 3-pin fixed socket (mating plug type: FFA.1S.303.CLAC52)



Pin 1: +15 V
Pin 2: –15 V
Pin 3: GND

Scope of Delivery	LCA-S-400K-IN, internally threaded coupler ring, LEMO® 3-pin connector, datasheet, transport package

Ordering Information	LCA-S-400K-IN-FST	1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories

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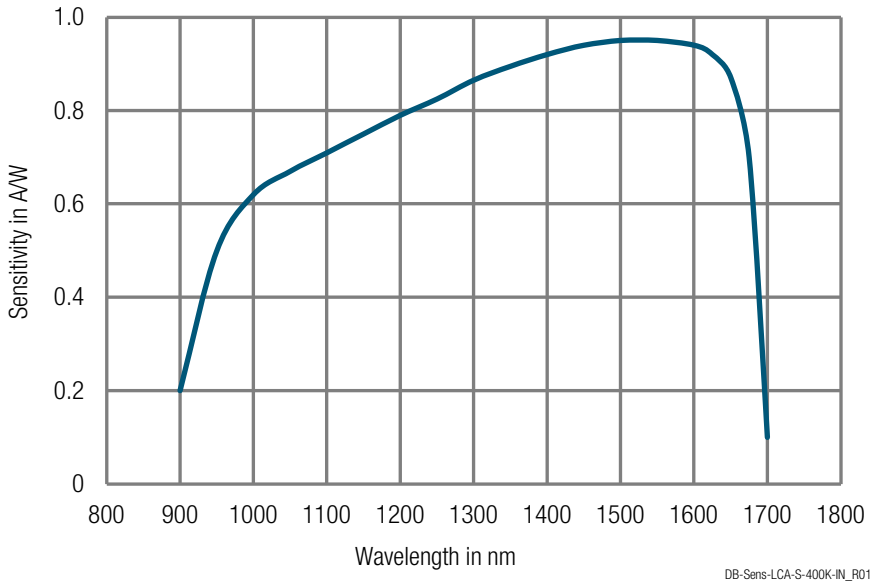
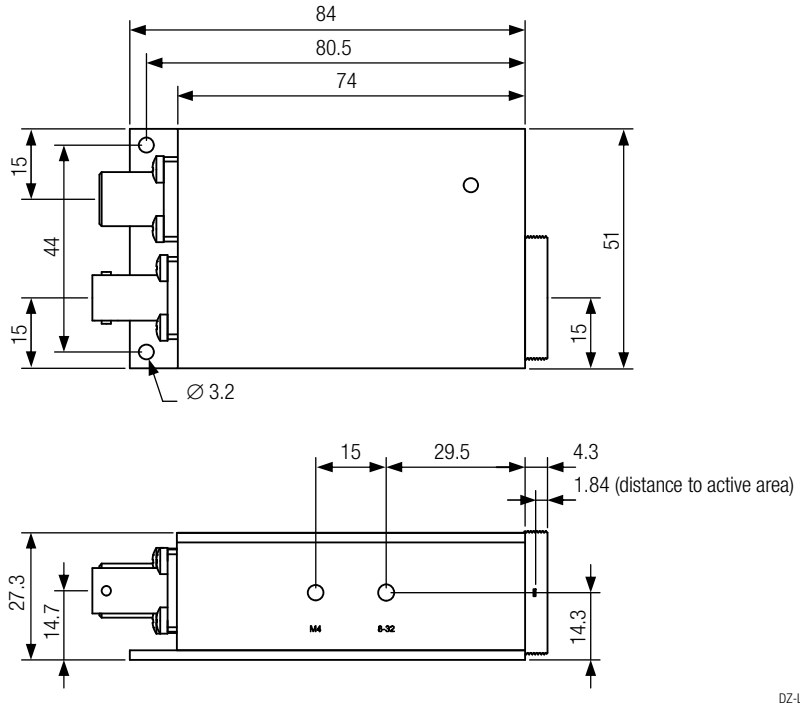
Spectral Responsivity



Dimensions

LCA-S-400K-IN-FST (1.035"-40 threaded free space input)



all dimensions in mm unless otherwise noted

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