

Operation Instructions

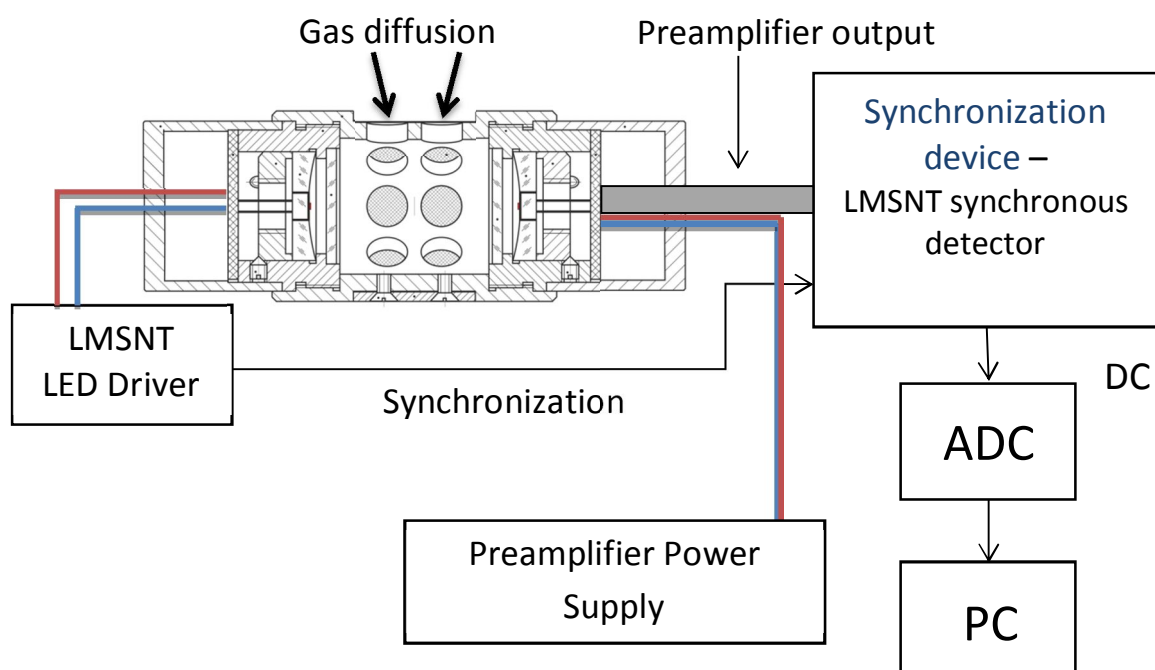
General

CDS-3 is an evaluation board for CO₂ detection. It includes a mid-infrared light emitting diode Lms43LED with LED driver, photodiode Lms43PD-03 with preamplifier and synchronous detector. CDS-3 has a three-pass gas chamber. Total length of the optical path is about 70 mm.

Input and Output Connections

1. Connect the LED driver to the appropriate pins of the LED.
(Note! Red dot or “+” sign of the driver socket must be connected to the red wire of the LED.)
2. Connect the preamplifier output with a synchronous detector input.
(Note! If necessary, you can transmit and record the signal from synchronous detector output to your PC via ADC.)
3. Connect the LED driver with a synchronous detector via synchronization cable.
4. Connect a 5V DC stabilized power supply to the preamplifier power input.
5. Select the needed mode of the LED driver.
(Note! You can find out more about driver modes in the driver instruction manual.)
6. Turn on the driver.

Layout & Connections





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Appearance & Dimensions



CDS-3 has length ~ 80 mm and max. diameter 28 mm.

! PRECAUTIONS

1. Turn on the power supply of the LED Driver only after all connections are made and tested.
2. Do not switch driver regimes during operation.
3. Disassembling of the LED-PD optopair is not recommended.

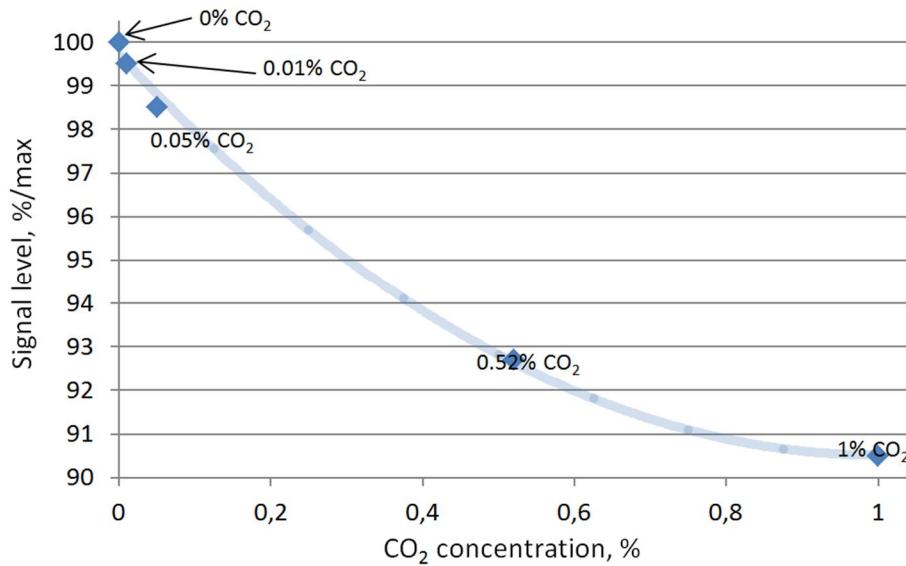


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Working Tips

LMSNT LED drivers allow operation in different modes, so you can choose the mode that suits you most. Please refer to the appropriate LED driver operation manual for working procedures.

Signal of LMSNT synchronous detector at different CO₂ concentrations:





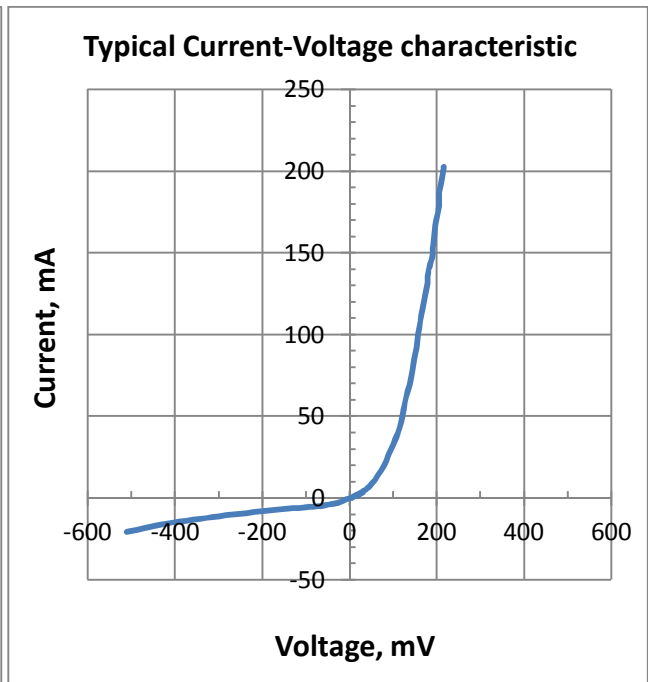
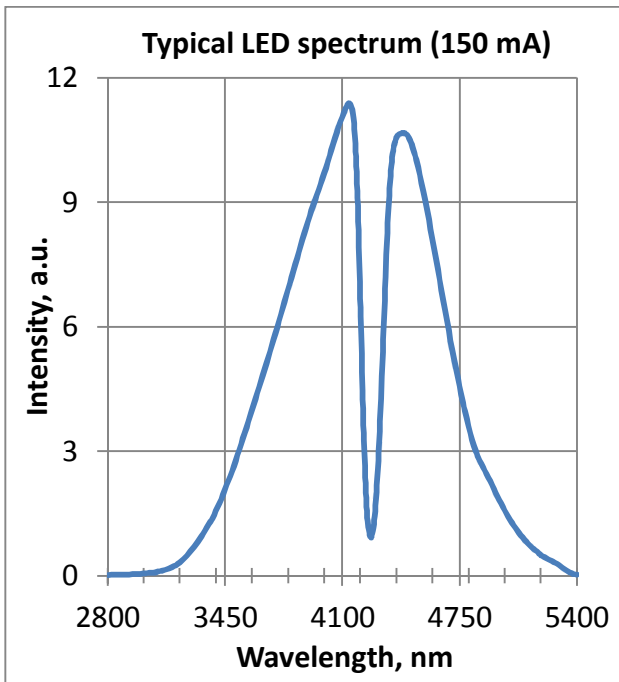
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LED-PD optopair main parameters

Lms43LED main parameters (QCW operation mode, f=0.5 kHz, T=24°C)

Parameter	Units	Conditions	Ratings
Peak emission wavelength	μm	150 mA	4.14
FWHM of the emission band	nm	150 mA	980.0
Temperature drift of emission peak	nm/K	-	2
Average optical power	μW	50 mA	5.66
		100 mA	10.95
		150 mA	15.71
		200 mA	19.69



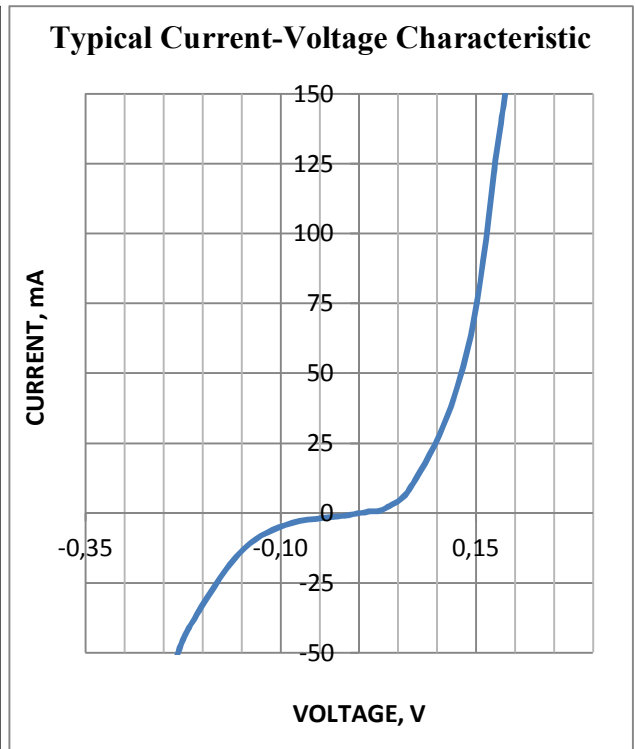
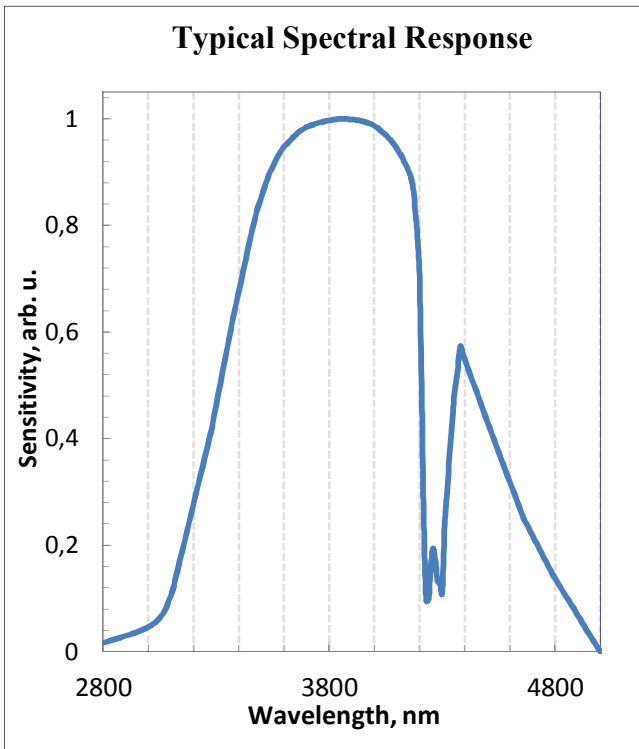


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Lms43PD-03 main parameters (T=24°C)

Parameter	Units	Conditions	Ratings
Sensitive area diameter	mm	-	0.3
Cut-off wavelength	μm	-	4.80
Peak sensitivity wavelength	μm	-	3.90
Dark current	mA	(V _r = -0.1 V)	7
Shunt resistance	Ω	(V _r = -10 mV)	12.0





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Packaging Arrangement




- Light-emitting diode Lms43LED
- Photodiode Lms43PD-03
- PD preamplifier
- SDM Synchronous Detector
- D31/D41/D51 LED Driver (depends on customer request)

(Note! For brief information about drivers, see Appendix.)

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APPENDIX

Drivers Applicable For Evaluation Board.

<p>LED driver D-31M</p> 	<p>D-31M Driver provides two modes of operation:</p> <ul style="list-style-type: none"> ✓ Quasi Continuous Wave (qCW) (quasi steady-state) mode. Using this mode it is possible to adjust current in range 25-250 mA and select one of four frequencies (0.5 kHz, 2 kHz, 8 kHz and 16 kHz). ✓ Pulse mode: Using this mode besides frequency adjustment it is also possible to change pulse duration in range 0.6-20 μs. Peak current in pulse mode can be adjusted in range 0-2 A.
<p>LED driver D-41</p> 	<p>D-41 Driver provides one mode of operation:</p> <ul style="list-style-type: none"> ✓ Pulse mode: Using this mode it is possible to choose one of five current values (0.25/0.5/1/1.5/2 mA) and select one of four frequencies (0.5 kHz, 2 kHz, 8 kHz and 16 kHz). It is also possible to choose pulse duration within four values (2/5/10/20 μs).
<p>LED driver D-51</p> 	<p>D-51 Driver has the same characteristics as D-41 and also has an important feature:</p> <ul style="list-style-type: none"> ✓ Temperature control – possibility to define LED p-n junction temperature using current-voltage dependence. Driver generates the low current signal for plugged LED, measures and puts out the voltage. Using the obtained voltage value it is possible to calculate the intrinsic LED temperature.