LED Microsensor NT

MCD
MULTICHANNEL LED DRIVER
INSTRUCTION MANUAL

rev. 100616

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Application

MCD driver is a utility board that unites several functions:

- power supply of arrays comprising of Mid-IR LEDs, supporting up to 8 channels;
- photodiode signal processing and amplification;
- synchronisation of LED and photodiode signals.

Compatibility table

One-element LED models	
LmsXXLED	✓
LmsXXLED-R	✓
LmsXXLED-RW	✓
LmsXXLED-TEM	✓
LmsXXLED-TEM-R	✓
Standard multielement LED models	
LmsXXLED-4M	✓
LmsXXLED-4M-R	✓
LmsXXLED-4M-RW	✓
LmsXXLED-4M-TEM	✓
LmsXXLED-4M-TEM-R	✓
Lms18-..-23LED-6M	✓
Lms18-..-23LED-6M-TEM	✓

Note! Please contact us to specify compatibility of custom multielement LED models.

Features

- **Pulse mode operation** (mode that provides **maximum peak optical power**).
- LED current amplitude and pulse duration **are preset by manufacturer** according to a customer's request.
- **Ability to work** either with **PD models without a built-in preamplifier** (enabling an on-board MCD preamplifier) or with **PD models with a built-in preamplifier**[*].
- Built-in **8-channel synchronous detector**, which provides **synchronisation of LED signals** with a **photodiode preamplifier** and further signal amplification.

Operation conditions

Indoor operation only. Ingress Protection Rating IP00.

[*] You should choose the photodiode model (with or without a built-in preamplifier) to work with MCD driver beforehand, since the driver is able to operate with only one photodiode type and should be tuned in advance accordingly.

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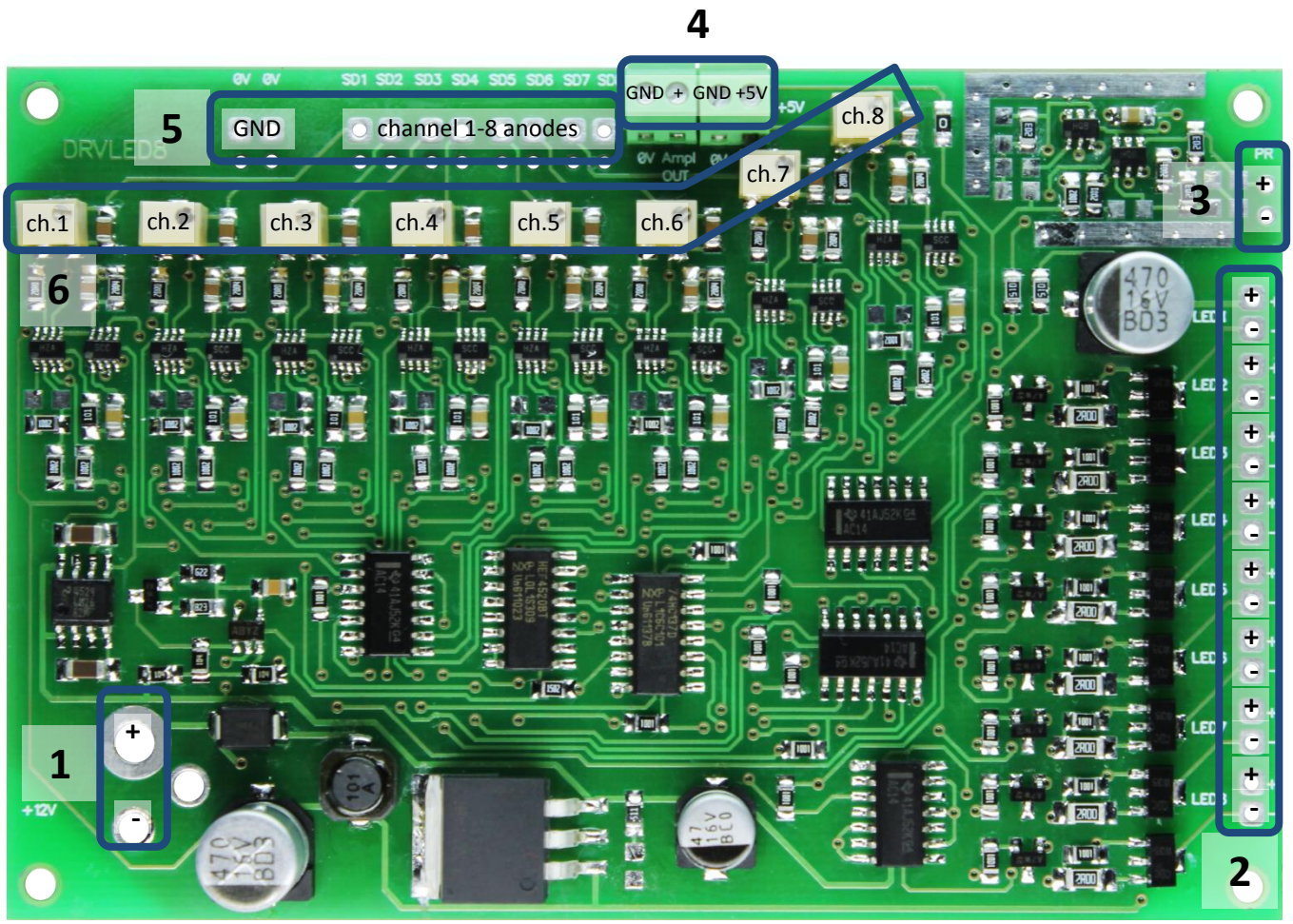
DRIVER LAYOUT



1. Power input terminal block.
2. LED connection contacts.
3. Photodiode connection contacts.
4. Photodiode preamplifier connection terminal blocks.
5. Synchronous detector signal output contacts.
6. Output signal gain adjustment potentiometers.

Note! Please refer to your provider if you have any questions.

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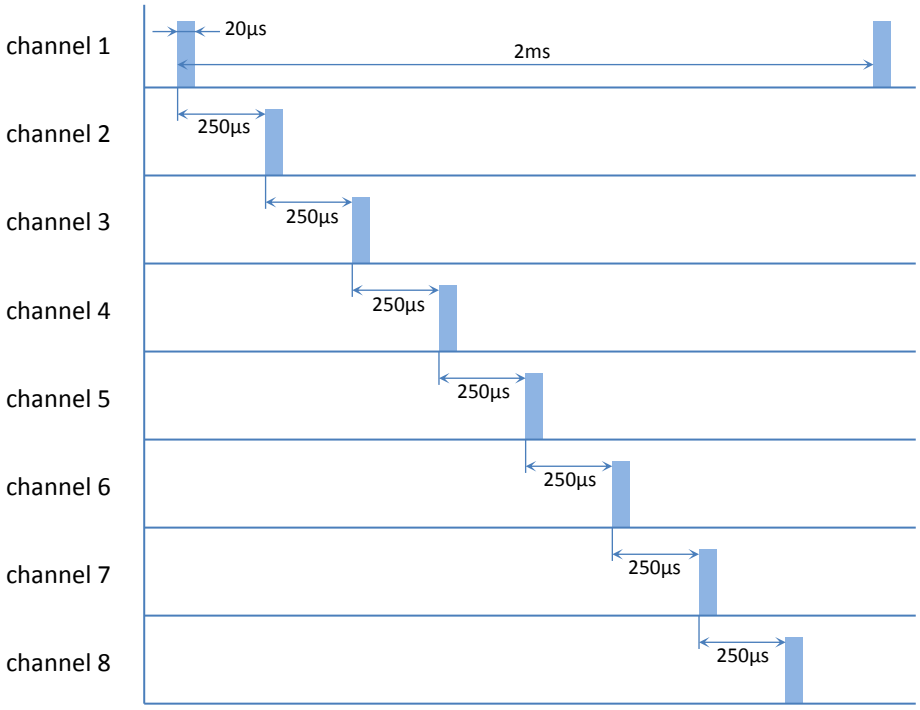
MCD driver drives LEDs in a **pulse mode**. This mode provides LED maximum peak optical power. LED current value is 0.4 A per channel (by default), pulse duration value of every channel is 20 µs (by default)*. Frequency of each channel is 500 Hz; 8-channel frequency is 4 kHz, this corresponds to photodiode reading frequency.

Every channel lights up sequentially; this enables scanning of a certain spectral range covered by a multielement LED array.



Pulse mode current-time relation.

* Pulse duration and current values can be readjusted by manufacturer.

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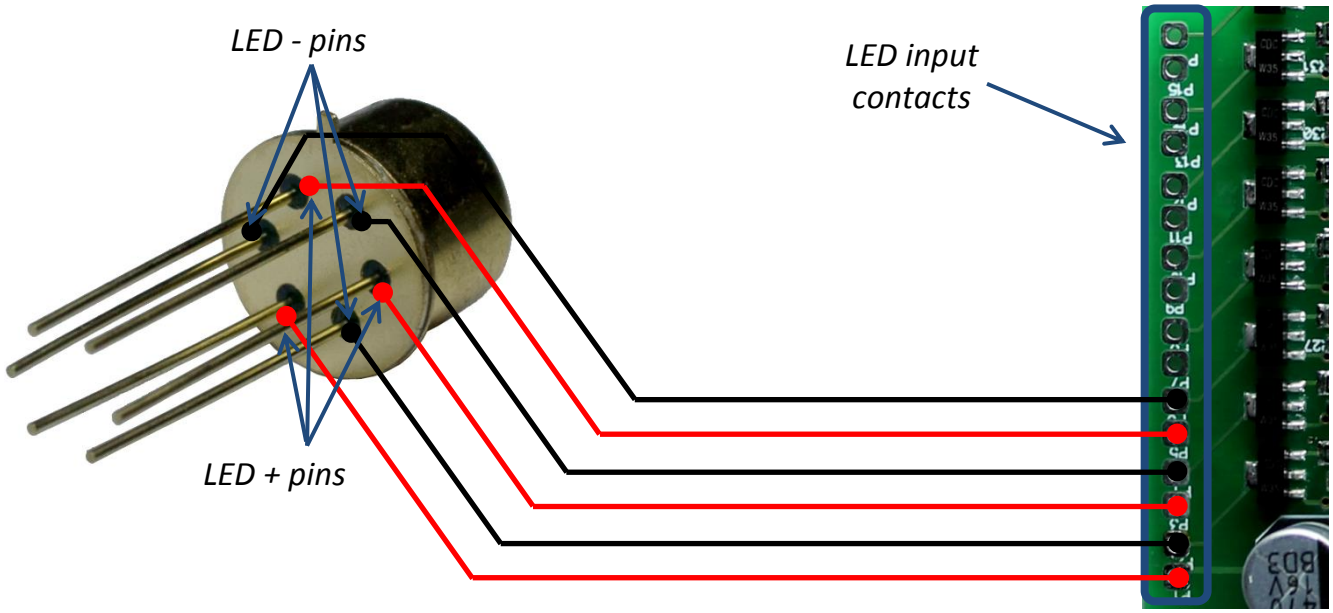
1. Carefully and securely connect (via soldering) cathode/anode pins of the LED array with LED driving contacts (2).

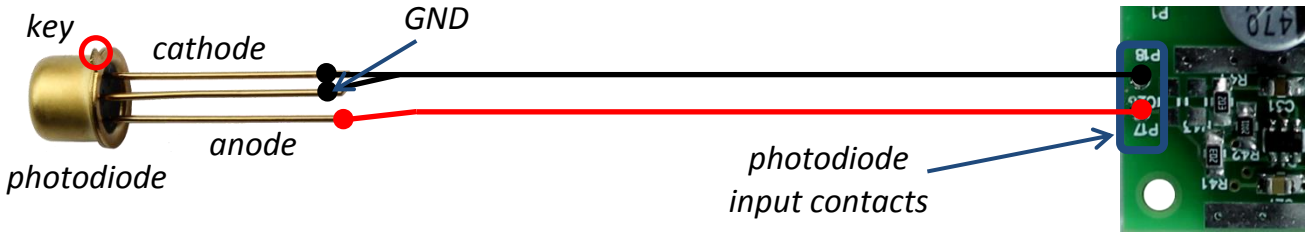


Note! Picture above is for illustration only. Pay your attention to LED electrodes configuration appropriate to your LED array referring to the technical report for the array. Also observe the polarity of each element of the array: “P1”, ”P3”, “P5”, ”P7”, “P9”, ”P11”, “P13”, ”P15” contacts should be connected to the anodes of LEDs. Improper connection may cause LED damage.

Note! LED matrix case must be electrically isolated from the ground.

Important! You should choose the photodiode model (with or without a built-in preamplifier) to work with MCD driver beforehand, since the driver is able to operate with only one photodiode type and should be tuned in advance accordingly. Take one of the two following steps (2a or 2b) basing on your choice.

2a. Carefully and securely connect (via soldering) a photodiode with photodiode connection contacts (3). Photodiode cathode and GND should be electrically connected.



Note! Ensure the wires’ shortest possible length between a photodiode and MCD board.

Note! Provide reliable screening of the wires.

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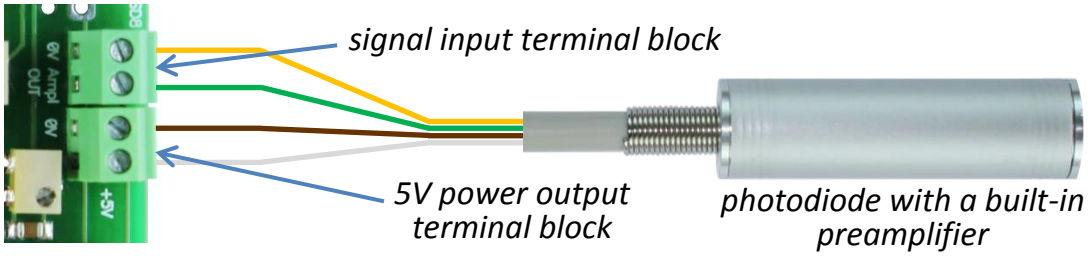
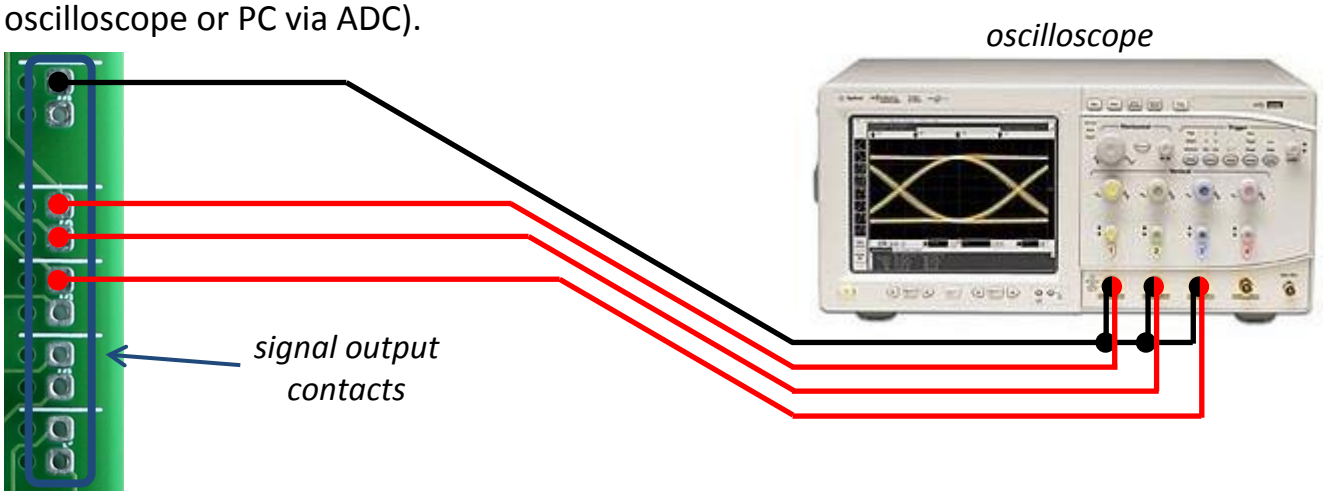
2b. If you use LMSNT photodiode with a built-in preamplifier (LmsXXPD-XX-PA models), then connect preamplifier cords to preamplifier input terminal blocks (4) as following:



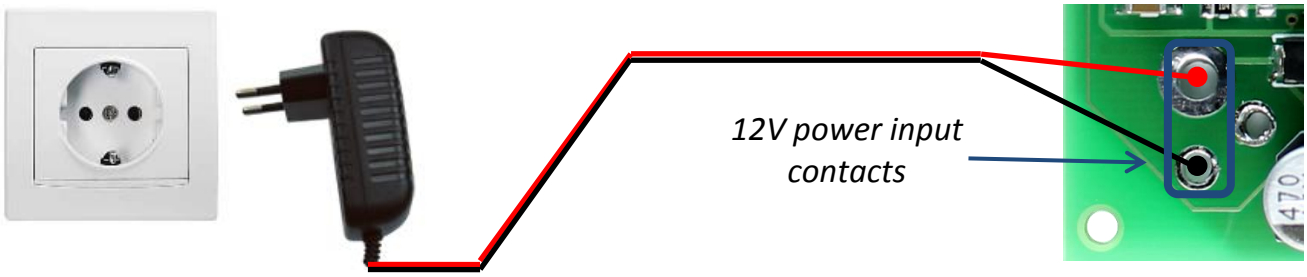
White cord – to the power output "+"; Brown cord – to the power output "0"; green cord – to the signal input "+"; Yellow cord – to the signal input "0"

3. Connect signal output contacts (5) with signal observing device (multimeter, oscilloscope or PC via ADC).



4. In case of need adjust amplification signal gain for each channel with the help of the appropriate potentiometers (6).

6. Connect a power supply to the power input (1).



Note! Please follow the requirements presented in the table on the "Technical Characteristics" page to provide driver's faultless operation.

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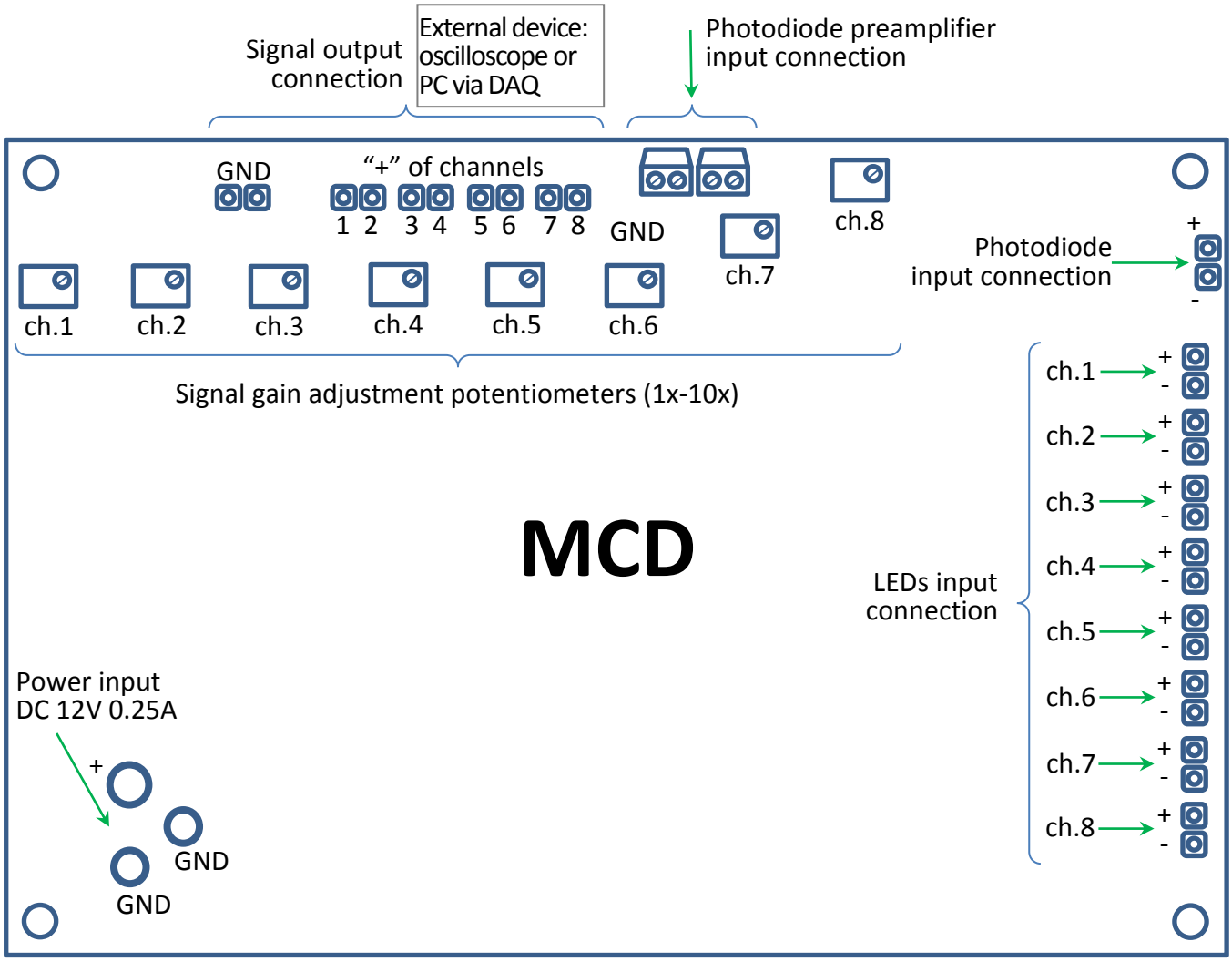

MCD connections

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Input voltage	+12 V, stabilized
Voltage tolerance	-5..+5 %
Input current	max. 0.25 A
Board dimensions	105×70×15 mm
Signal output voltage amplitude	11 V (-4 V for inverted photodiode signal)

Fixed parameters	
Pulse duration	20 µs*
Frequency (per channel)	0.5 kHz
Frequency (8 channels)	4 kHz
Output current amplitude	0.4 A*
Adjustable parameters	
Output signal gain	1x-10x

* Pulse duration and current values in the table are default, but can be preadjusted by manufacturer.

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