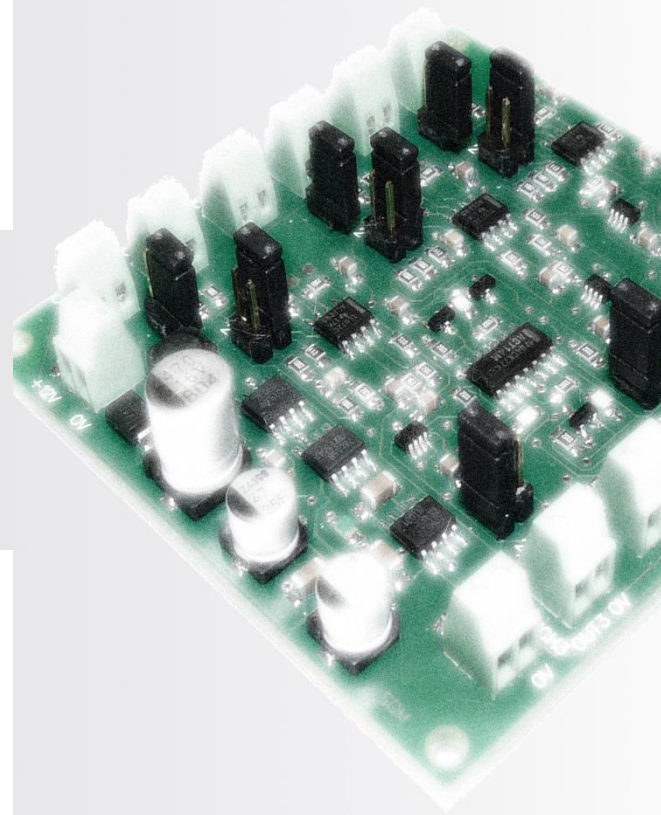




SDM  
SYNCHRONOUS DETECTOR  
INSTRUCTION MANUAL



rev. 100120

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## Application

SDM synchronous detector enables coordinated operation of the systems with drivers and preamplifiers, measures the voltage signal from the output of photodiode preamplifier and converts it to the DC voltage signal proportional to amplitude of voltage from input.

SDM synchronous detector is optimized for work in a pulse mode, since in this mode the highest signal amplitude and STN ratio can be achieved.

## Features

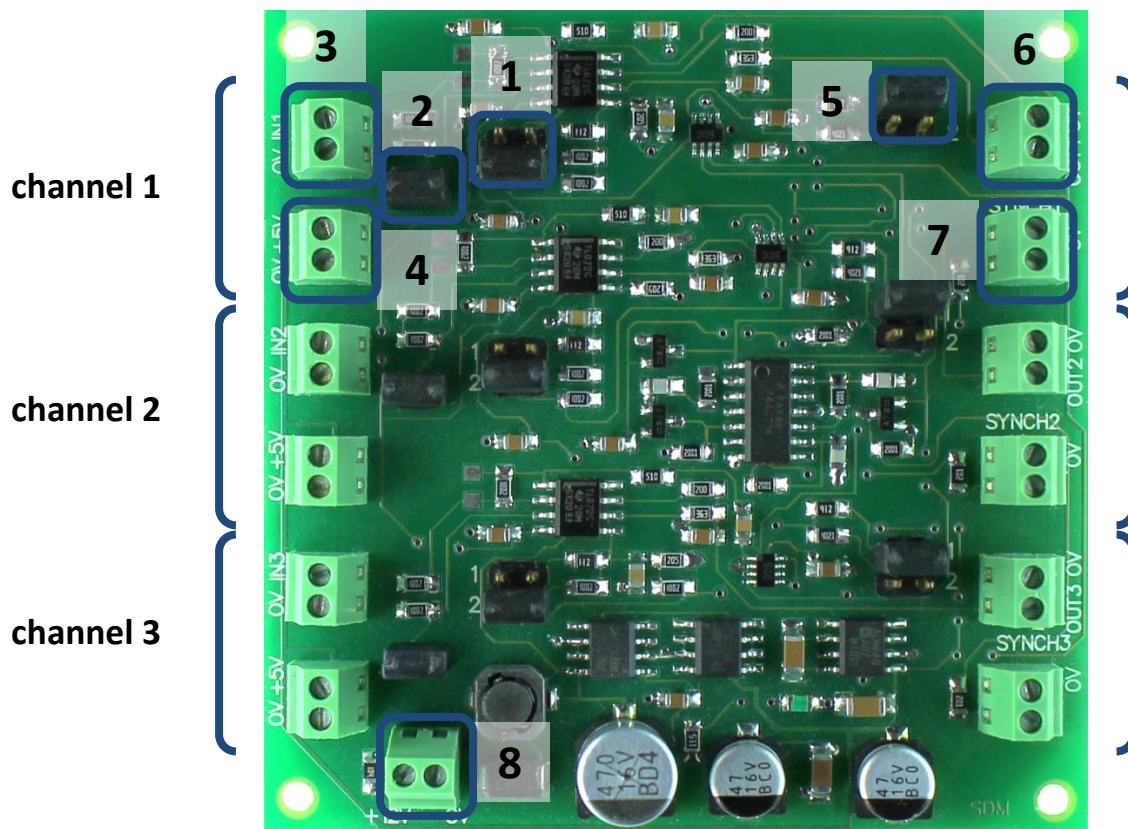
- **Three independent channels** for detection. One can connect three systems with drivers and preamplifiers and run them through the synchronous detector simultaneously.
- Built-in **power supply for preamplifiers**.
- Possibility of **input polarity inversion** using the appropriate jumper. In case of wrong polarity connection from photodiode preamplifier one can simply switch the input polarity inversion jumper.

## Operation conditions

Indoor operation only. Ingress Protection Rating IP00.

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

## SYNCHRONOUS DETECTOR LAYOUT



### Channel 1:

1. Averaging time adjustment jumper:  
("1" - 50ms, "2" - 200ms, w/o jumper - 350ms).
2. Input polarity inversion jumper.
3. Signal input (from output of preamplifier) terminal block.
4. Power output terminal block (for preamplifier supply) (DC, unipolar, 5V).
5. Output signal gain adjustment jumper:  
("1" - 5x gain, "2" - 10x gain, w/o jumper - 1x gain).
6. Signal output terminal block.
7. Synchronization input terminal block (from LED driver synchronization output).

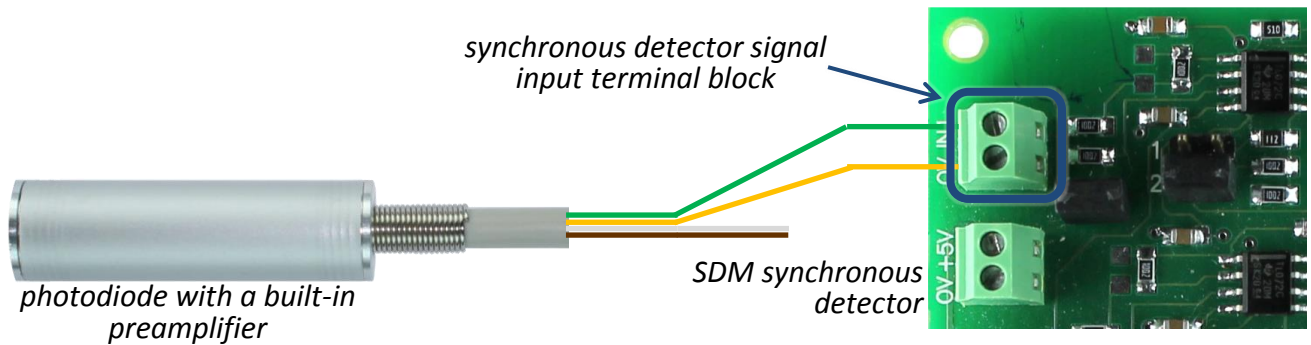
Channel 2. Independent channel with its own set of jumpers and terminal blocks.

Channel 3. Independent channel with its own set of jumpers and terminal blocks.

8. Power input terminal block (DC, unipolar, +12V).

## OPERATING INSTRUCTIONS

1. Connect preamplifier output wires with signal input terminal block (3) till tight fixation. If you use LMSNT photodiode with a built-in preamplifier (LmsXXPD-XX-RW-PA model), then make a connection in the following way:

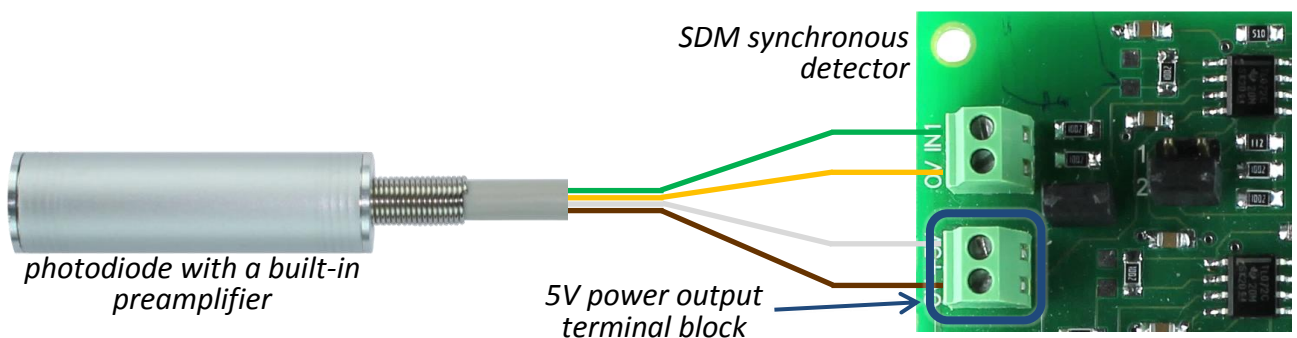


green cord – to the signal input “+”; Yellow cord – to the signal input “0”

**Note!** Some signal processing devices work with inverted signals only. If the inverted polarity of the synchronous detector output signal is needed one may switch the input polarity inversion jumper (2).

**Note!** To minimize noise we recommend screening the wires from preamplifier.

2. Connect +5V power output terminal block (4) with preamplifier power input unless external power supply for preamplifier is used. If you use LMSNT photodiode with a built-in preamplifier (LmsXXPD-XX-RW-PA model), then make a connection in the following way:



White cord – to the power output “+”; Brown cord – to the power output “0”

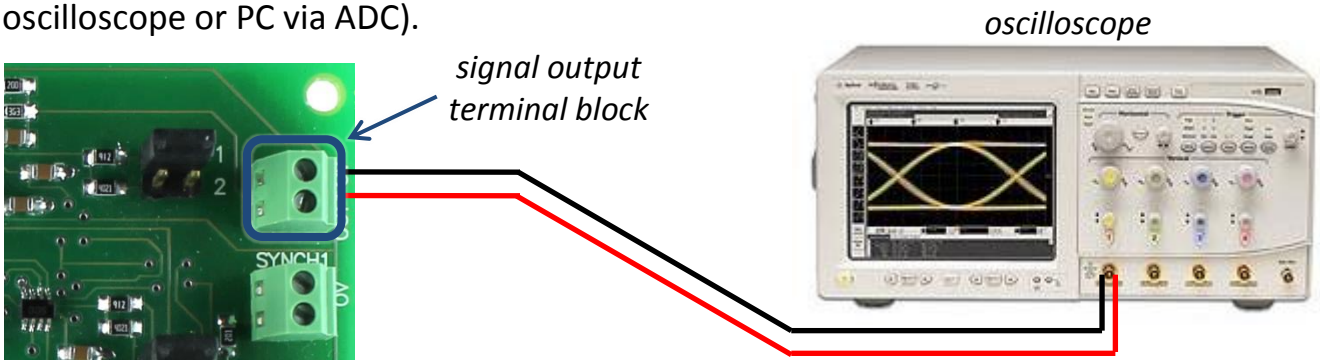
**Note!** If you use a standalone version of the preamplifier (PAb board), make sure that the connection between the photodiode and the preamplifier is proper, safe and securely screened and take the abovementioned steps 1-2.



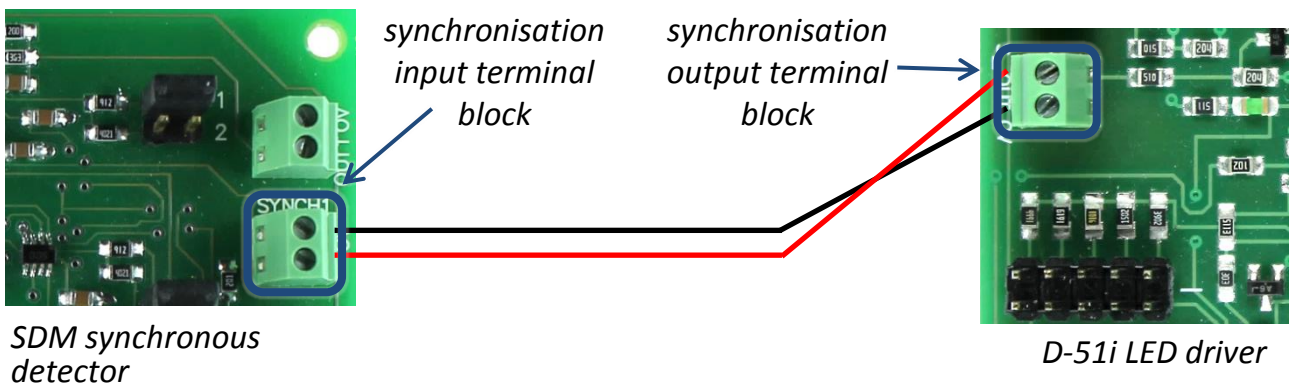
## OPERATING INSTRUCTIONS

**Note!** Pay your attention to the colours of the cords; actual colours may differ from ones pointed in the present manual, follow the instructions pointed in the technical data provided with the ordered LmsXXPD-XX-RW-PA.

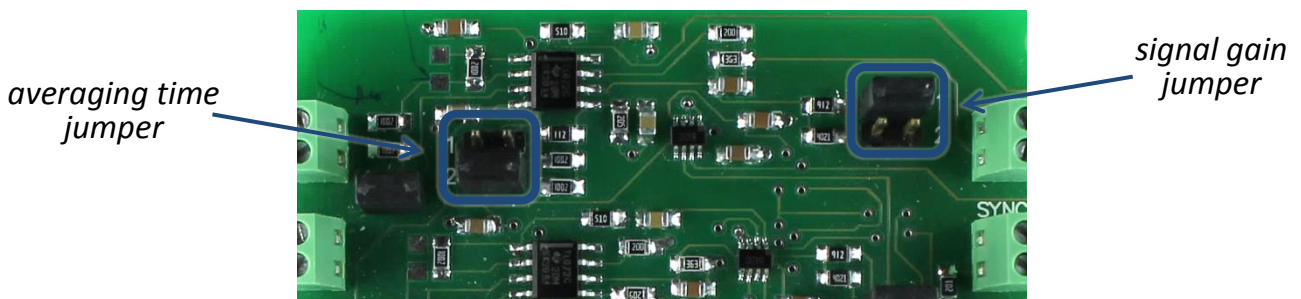
3. Connect signal output terminal block with signal observing device (multimeter, oscilloscope or PC via ADC).



4. Connect wires from LED driver's synchronization output with synchronization input terminal block (7).



5. Choose the needed averaging time and signal amplification with the help of the averaging time (1) and signal gain (5) jumpers of the SDM synchronous detector.



## OPERATING INSTRUCTIONS

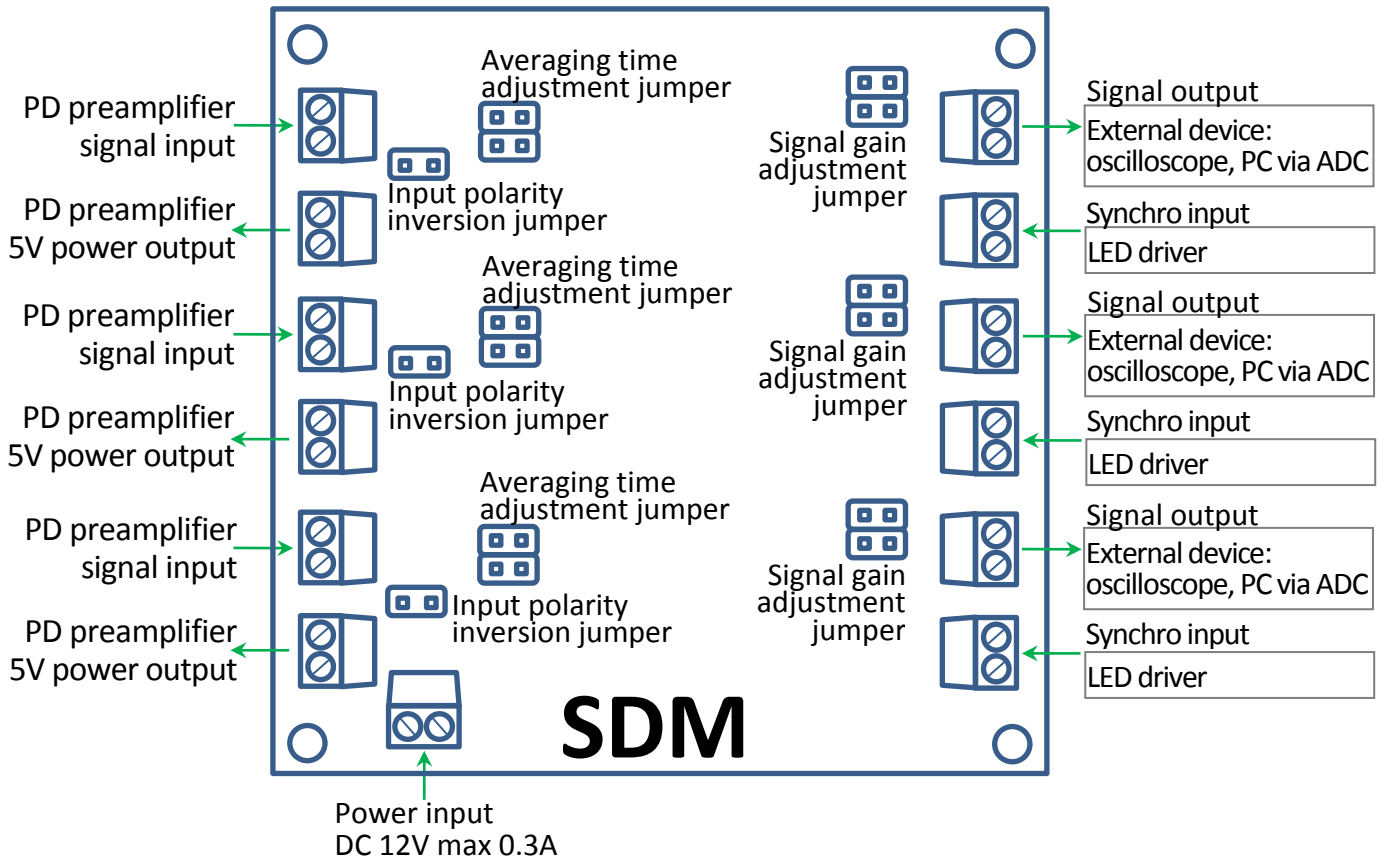
6. If necessary, make all the connections of other boards (driver, thermocontroller etc.) following the appropriate instructions manuals. Before turning them on check the required connections and modes:

Driver:

- LED connection
- Synchronisation with sync. detector
- Pulse duration, frequency, current selection
- External connections (if necessary)

7. Turn on the SDM board connecting +12V power supply with power input terminal block (8).

# SYNCHRONOUS DETECTOR CONNECTIONS



## SDM connections



## TECHNICAL CHARACTERISTICS

Power supply voltage	+12 V, stabilized
Voltage tolerance	-5..+5 %
Power supply current, max	0.3 A
Board dimensions	70×70×19 mm
Preamplifier supply output voltage	5 V
Output constant voltage signal, max	10 V (-3 V for inverted signal)

<b>Adjustable parameters</b>	
Averaging time	50/200/350 ms
Signal gain	1x/5x/10x

<b>Supported operation modes</b>	
Pulse duration	$\geq 5 \mu\text{s}$
Frequency	0.5-16 kHz
Input voltage signal from preamplifier, max	$\pm 3 \text{ V}$