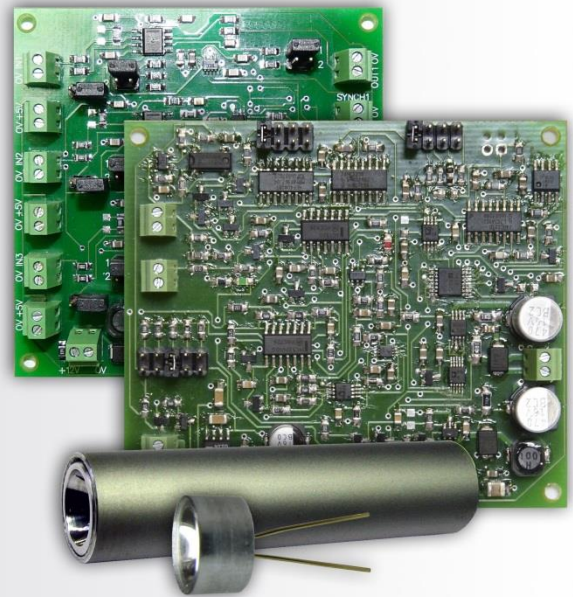




UDK  
UNIVERSAL EVALUATION KIT  
INSTRUCTION MANUAL



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## GENERAL INFORMATION

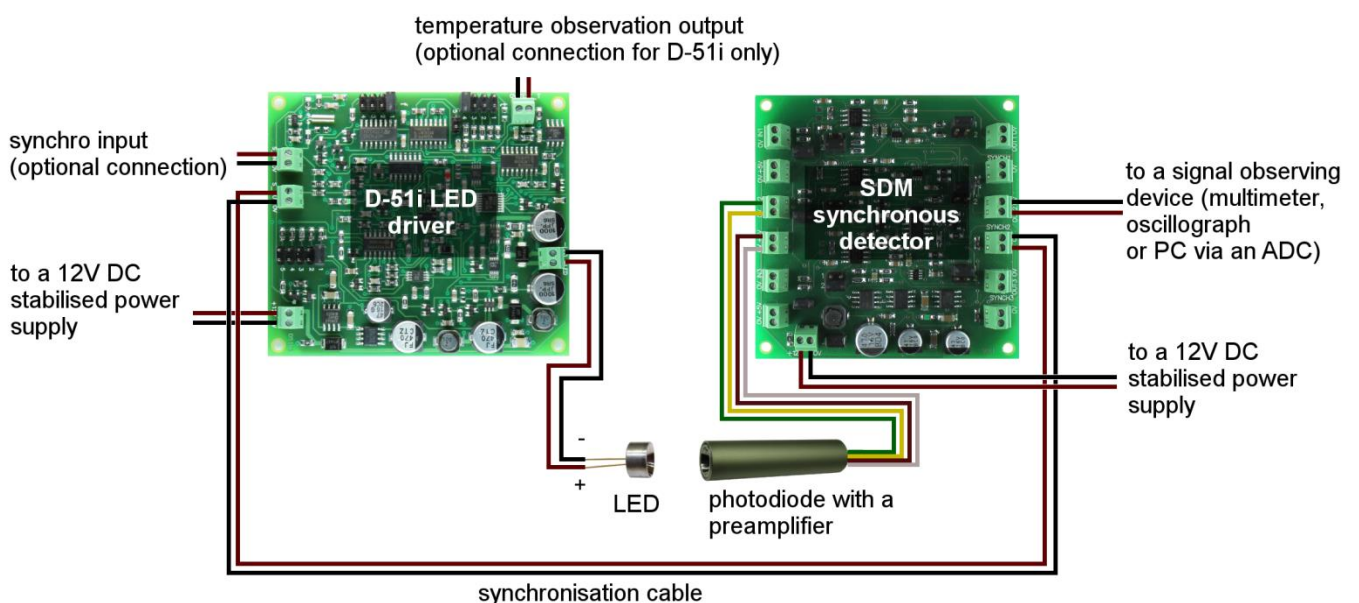
### Application

UDK is a universal evaluation kit for based on mid-infrared LED-PD optopair, which includes all the needed components for quick and simple start. The possibility to change the parts within the kit easily makes the kit a flexible and utility solution.

### Packaging arrangement

UDK includes:

- Light-emitting diode (chosen by customer)
- Photodiode with a built-in PD preamplifier (chosen by customer)
- D-41i/D-51i/mD-1p/mD-1c LED Driver (depends on customer request)
- SDM synchronous detector
- acrylic glass optical chamber (optional)



### Operation conditions

Indoor operation only. Ingress Protection Rating IP00.

## BRIEF OVERVIEW OF THE COMPONENTS INCLUDED

- Light-emitting diode

Light-emitting diode in TO-18 with a cap or parabolic reflector. For detailed information and set of characteristics please refer to the appropriate LEDs' datasheets and technical passports.

- Photodiode with a built-in preamplifier

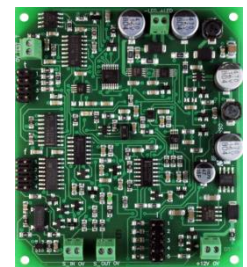
Photodiode has a built-in preamplifier and is mounted in an aluminium tube. Preamplifier works with photodiode in a photovoltaic mode (with no reverse bias), it amplifies the current generated by photodiode and converts it into pulse voltage signal. There is straight correspondence between PD current and resulting output voltage, i.e. if the photocurrent from photodiode is a meander, the converted signal will be a meander too with the same frequency and pulse duration.

For detailed information and set of characteristics of photodiodes please refer to the appropriate photodiodes' datasheets and technical passports.

- D-51i/D-41i/mD-1p/mD-1c LED Driver (depends on customer request)

LED Driver is a power supply for an LED. D-41i/D-51i driver types have a set of adjustable parameters to customise the desired operation mode of an LED. Mini-drivers mD-1p and mD-1c provide operation at one fixed mode: pulse (mD-1p) or quasi-CW (mD-1c).

For brief information about drivers, please refer to **Appendix**. For comprehensive information about the driver please refer to the driver's Instruction Manual.



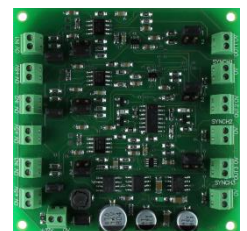
*D-51i LED Driver*

- SDM Synchronous Detector

SDM synchronous detector 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 has three independent channels for detection, so that three systems with drivers and preamplifiers can be connected and run through the synchronous detector simultaneously

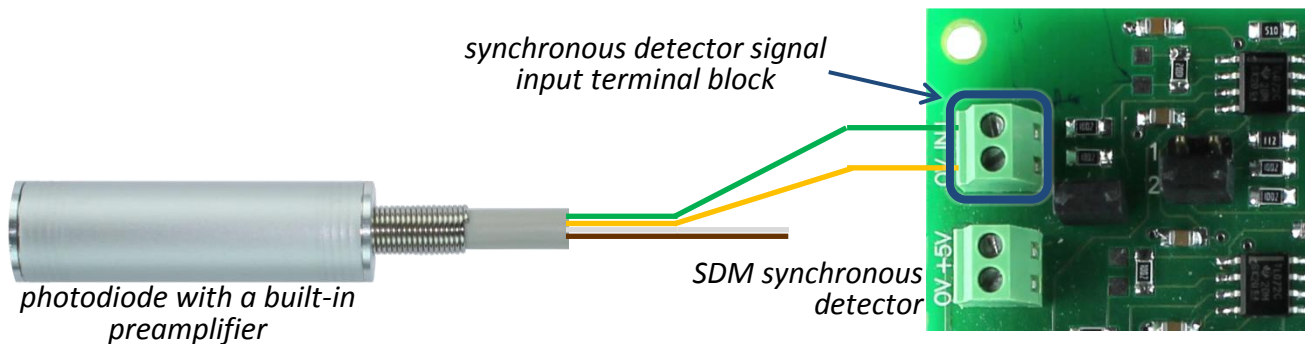
For comprehensive information about the synchronous detector please refer to the appropriate Instruction Manual.



*SDM  
Synchronous  
Detector*

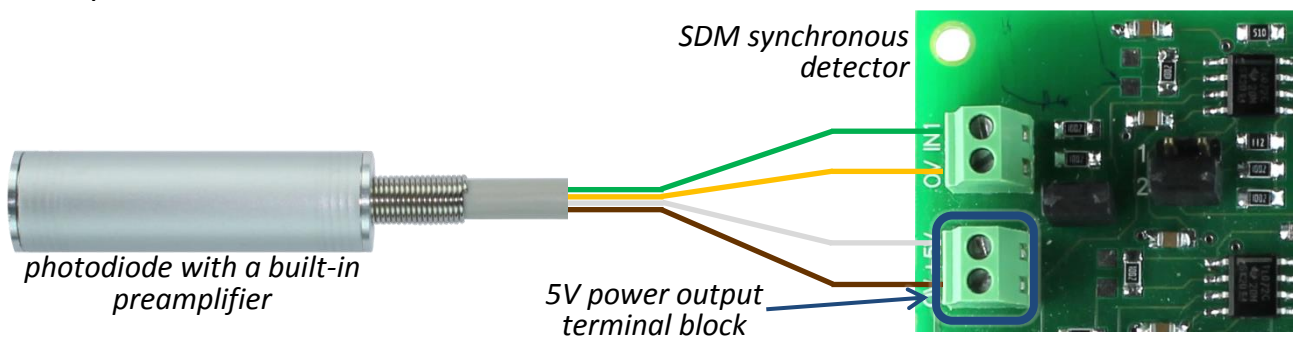
## OPERATION INSTRUCTIONS

1. Connect the preamplifier output with an input of SDM synchronous detector.



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

2. Connect a 5V power output of the SDM synchronous detector to the preamplifier power input.

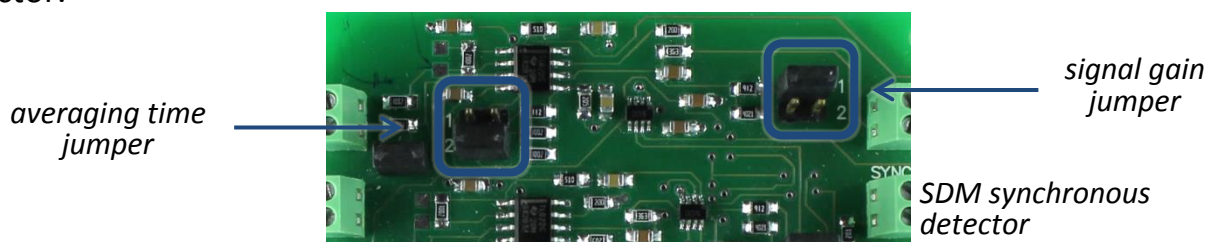


White cord – to the power output “+”; Brown cord – to the power output “0”

### Note!

- Please check your connection circuit before turning the PD on.
- Please do not connect the PD to the multimeter.
- Please do not touch the glass covering
- 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 order.

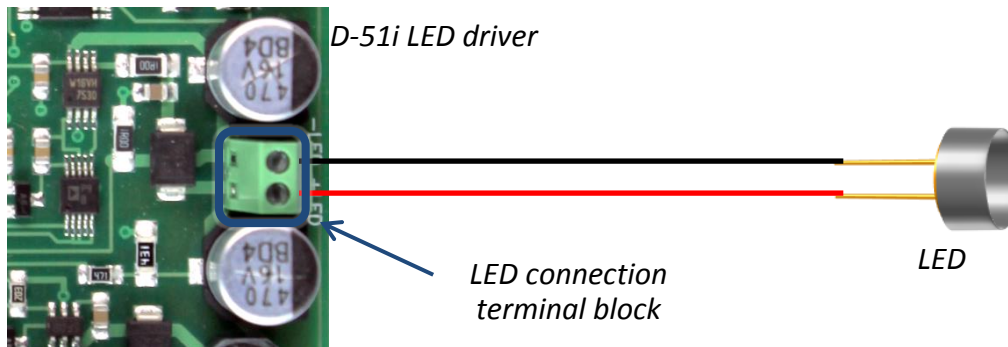
3. Select the needed signal gain and averaging time on the SDM synchronous detector.



**Note!** You can find out more about adjustment of the signal gain and averaging time in the appropriate SDM synchronous detector manual.

## OPERATION INSTRUCTIONS

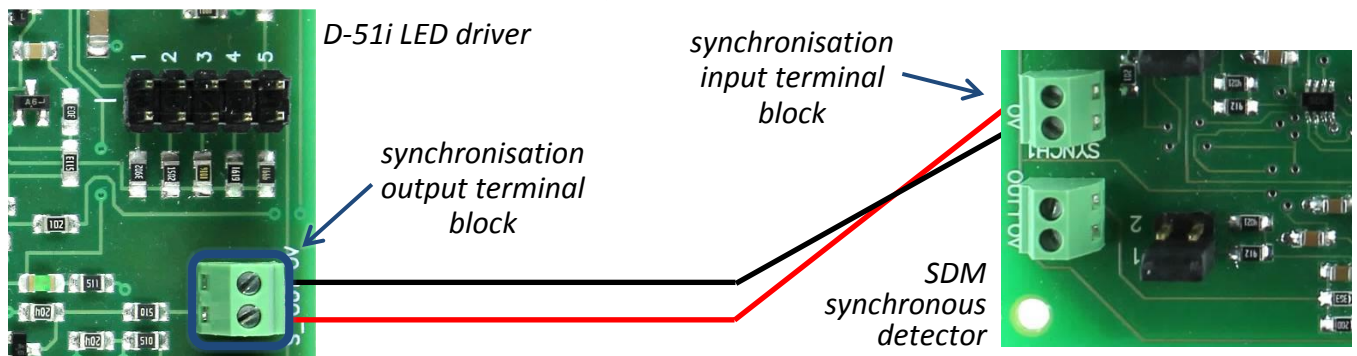
- Connect the LED pins to the LED connection terminal block of the LED driver.



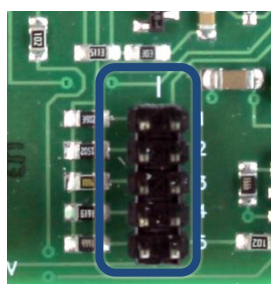
**Note!** All driver connections in this manual are pointed for D-51i LED driver, connections with other drivers should be done similarly.

**CAUTION!** The pin with red dot must be connected to the “+” sign of the driver terminal block.

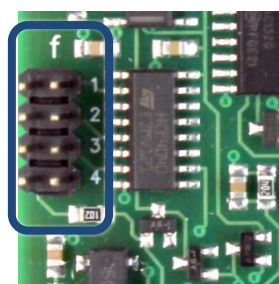
- Connect the synchronisation output of the LED driver with the synchronisation input of the synchronous detector via synchronisation cable.



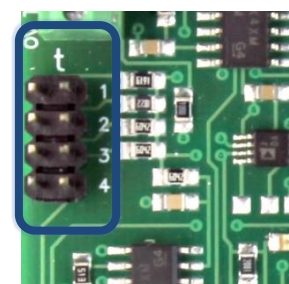
- Select the needed mode of the LED driver.



*current adjustment jumper*



*frequency adjustment jumper*

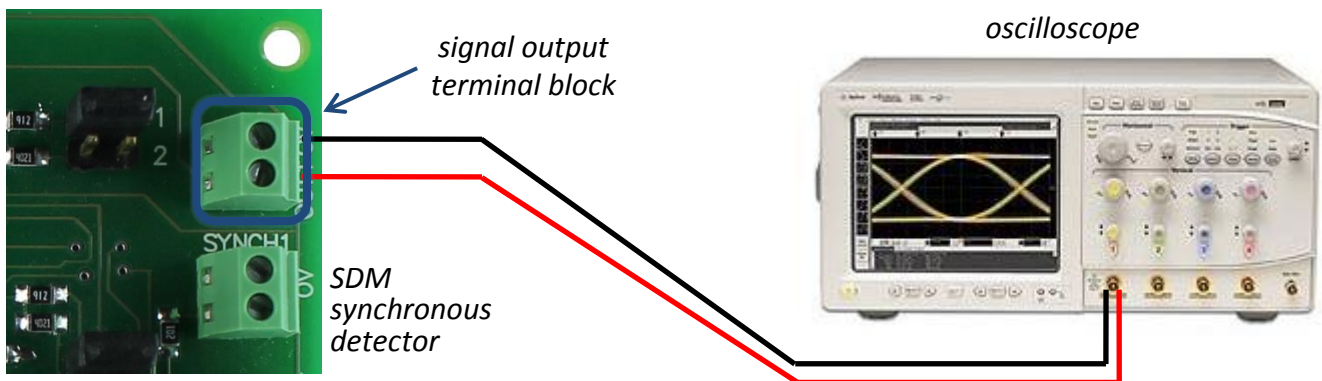


*pulse duration adjustment jumper*

**Note!** You can find out more about driver modes and their adjustment in the appropriate Driver Instruction Manual.

## OPERATION INSTRUCTIONS

- Connect signal output terminal block of the SDM synchronous detector with signal observing device (multimeter, oscillograph or PC via ADC).



- Connect a 12V DC stabilized power supply to the LED driver and SDM synchronous detector (red wire to the "+"; black wire to the "-").




## PRECAUTIONS & NOTES

- ⚠ Turn on the power supply of the LED Driver and SDM synchronous detector only after all connections are made and tested.
- ⚠ Do not switch driver regimes during operation.
- ⚠ Do not use multimeter to control and adjust current of the LED.

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



### Drivers Applicable for the UDK Evaluation Kit

|  |   |
|--|---|
| <p>LED driver D-41i</p>                   | <p>D-41i Driver provides <b>Pulse mode</b> operation. Using this mode it is possible to choose one of five current values (0.2/0.6/1/1.5/1.9 A) and select one of four frequencies (0.5/1/2/4 kHz) and choose pulse duration within five values (5/10/20/50/150 <math>\mu</math>s).</p>   |
| <p>LED driver D-51i</p>                  | <p>D-51i Driver has the same characteristics as D-41i but also has another important feature:</p> <p><b>Temperature control</b> – possibility to define LED p-n junction temperature using current-voltage dependence. Driver generates the low current signal for plugged LED, measures and outputs the voltage. Using the obtained voltage value it is possible to calculate the intrinsic LED temperature.</p> |
| <p>Minidrivers<br/>mD-1p and mD-1c</p>  | <p>Minidrivers can be chosen instead of D-41i/D-51i drivers as a more cost-effective and compact solution. Minidrivers work in fixed driving modes:</p> <p>mD-1p: pulse mode with 2 A current, 2 kHz frequency and 5 <math>\mu</math>s pulse duration.</p> <p>mD-1c: quasi-CW mode with 150 mA current, 1 kHz frequency and 500 <math>\mu</math>s pulse duration.</p>   |