Manual Light Driver 5.0

Content

Change History

Version	Change
V1.0	Released
	Manual compatible with LightCockpit v1.x, Firmware v1.x
V2.0	General Settings Standby mode p.14
	Master Slave Standby mode p.15
	Output LED state p.16
	Manual compatible with LightCockpit v2.x, Firmware v2.x
V2.1	macOS Support S.5

Product description

The Light Driver 5.0 is a highly efficient, programmable LED light controller specifically designed for use in the field of RC aeroplane model construction.
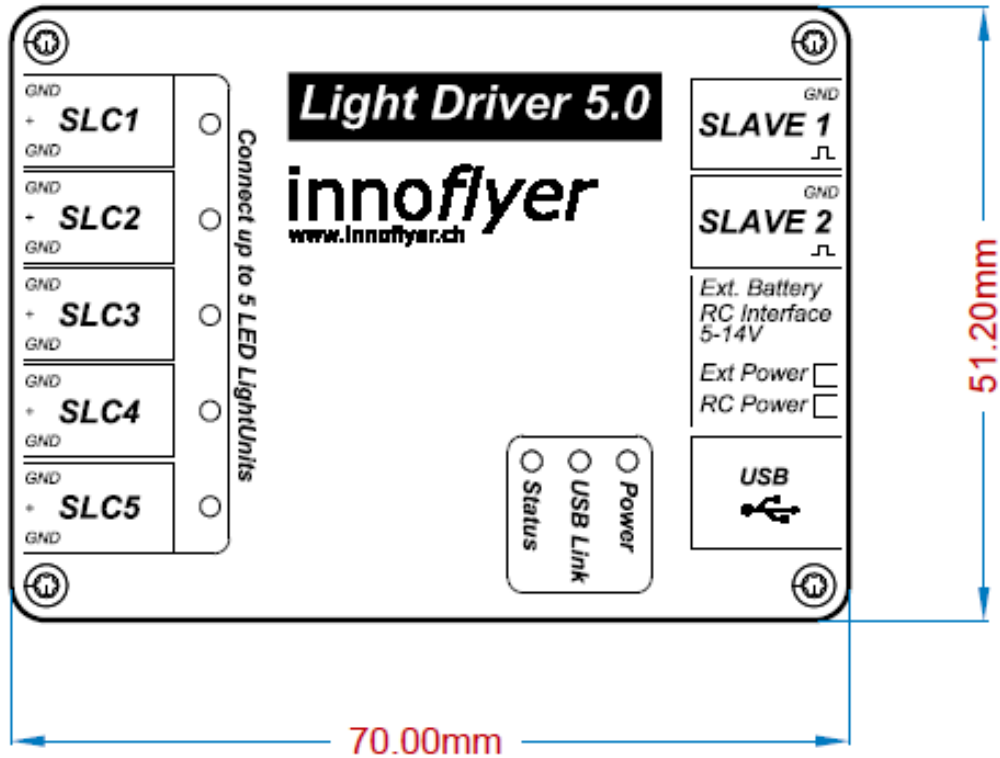
Each of the 5 Smart Light Channels (SLCs) controls and monitors a connectable innoflyer aircraft LED light. Thanks to modern circuit topologies, series resistors are no longer necessary. Maximum Light Tracking (MLT) and Plug&Play recognition of the connected aircraft LED lights guarantee an optimal temperature and maximum light output of the LEDs.

Thanks to configurable current sources, the connection of Third-Party Power LEDs is easy and simple. The Light Driver 5.0 can be programmed and adapted to your individual needs via USB, thanks to the free Windows or macOS Application LightCockpit software.
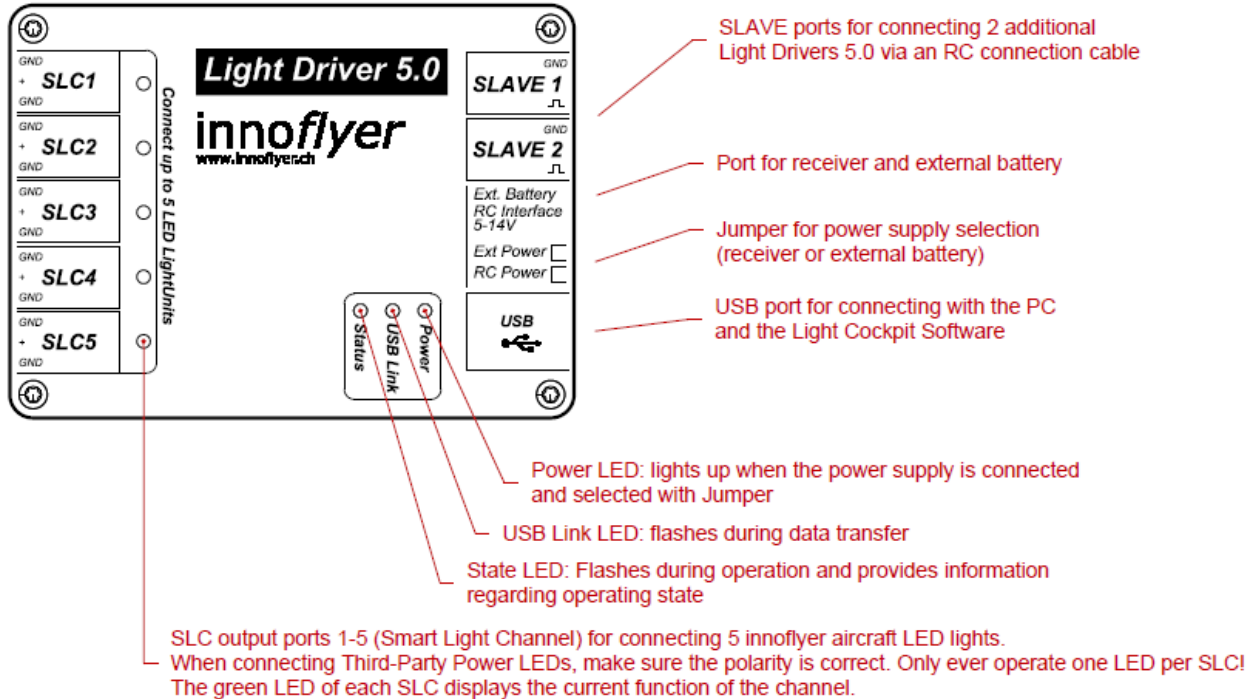
Specifications

Input voltage scope:	5V-14V Reverse polarity protected No energy feedback
LD 5.0 Power Rating:	5W continuous output 10W peak performance
SLC Power Rating:	Up to 2W continuous output
Number of SLC channels:	5
Compatible LED:	Power LED with I_F > 70mA and 2.4V < U_F < 3.4V All innoflyer aircraft LED lights
Number of Slaves:	2 (max. 15 SLC channels with 3 LD 5.0)
Additional ports:	1 USB 2.0 1 RC receiver (PWM, UNI connector) 1 external battery (JST connector)
Weight:	38g
Special functions:	Plug&Play -> Automatic detection of all connected innoflyer aircraft LED lights MLT -> optimisation of the light output for all connected innoflyer aircraft LED lights based on the current LED temperature
EMC/CE:	EMC 2014/30/EU EN 61000-6-3/1 | EN55015:2013 2011/65/EU RoHS2
Light Cockpit:	Windows 8.1 / Windows 10 macOS 10.11 El Capitan or later USB

Measurements

Layout and connection assignment

SLAVE ports for connecting 2 additional Light Drivers 5.0 via an RC connection cable

Port for receiver and external battery

Jumper for power supply selection (receiver or external battery)

USB port for connecting with the PC and the Light Cockpit Software

Power LED: lights up when the power supply is connected and selected with Jumper

USB Link LED: flashes during data transfer

State LED: Flashes during operation and provides information regarding operating state

SLC output ports 1-5 (Smart Light Channel) for connecting 5 innoflyer aircraft LED lights. When connecting Third-Party Power LEDs, make sure the polarity is correct. Only ever operate one LED per SLC! The green LED of each SLC displays the current function of the channel.

⚠️ **Important information:**

- Only operate Power LEDs with the Light Driver 5.0. Warning: Power LEDs are extremely bright, do not look directly towards the light at close range**!**
- innoflyer aircraft LED lights are reverse polarity protected and cannot be connected to the SLC incorrectly. Thanks to Plug&Play and MLT, the LEDs are automatically supplied with the correct current. The temperature is permanently monitored.
- When connecting Third-Party LEDs, make sure the polarity is correct. **Do not use series resistors.**
- The cabel length between the LEDs and the SLC can equal up to 4 m. **Always use twisted cables** (see accessories).
- Do not operate LEDs in parallel or in a line on an SLC.
- The receiver socket as well as the external battery connection are reverse polarity protected. There is no possibility of energy feedback between supply connections. Only the connection selected with the jumper is able to supply current.
- For programming via USB on the PC, the Light Driver 5.0 can be powered directly via USB. If LEDs are connected to the SLC at the same time, an additional power supply is necessary for the clean operation of the connection.

Start-up

Factory settings

The Light Driver 5.0 is delivered with a preconfigured setup featuring a simple 5-channel installation. The setup is configured for operation via 3-way switches. In order to use these, on your transmitter, programm a switch with the values pos 0: -100%, centre: 0%, pos 1: +100%

Connect your innoflyer aircraft LED lights to the Light Driver 5.0 in keeping with the following cable assign:

SLC 1	Position light red (Wink Tip left)
SLC 2	Position light green (Wing Tip right)
SLC 3	Beacon (fuselage upper sufrace or fuselage lower surface)
SLC 4	Tail light (rearward radiating)
SLC 5	Landing light

Via your RC system, the following on and off settings of the 5 SLCs are possible with the 3-way switch:

Pos 0:	SLC3 on
Centre:	SLC1 + SLC2 + SLC3 + SLC4 on
Pos 1:	SLC1 to 5 on

⚠️

Upon delivery, the SLCs are configured for operation with innoflyer aircraft LED lights. If you wish to use Third-Party LEDs, the SLCs must be configured accordingly with LightCockpit. Otherwise, the LEDs will be operated with the minimum current of 70mA.

Individual programming with LightCockpit | First steps

The Light Driver 5.0 in combination with LightCockpit enables individual programming of the lighting system. In order to carry out the programming, you need a Windows or macOS Computer and the LightCockpit Software. LightCockpit can be downloaded for free on our website www.innoflyer.ch.

Install LightCockpit and follow the instructions provided by the Setup wizard. along with LighCockpit, the necessary USB drivers for Light Driver 5.0 are installed automatically.

First Steps:

Here are the five golden rules for using LightCockpit:

1. If LightCockpit is running and you connect a Light Driver 5.0 via USB, the configuration of the latter will **always and automatically** be loaded into LightCockpit. Any executed settings in LightCockpit will be overwritten. To avoid losing these settings, save them **before** connecting the Light Driver 5.0.
2. Only ever connect one Light Driver 5.0 to your PC, never two at the same time.
3. Once LightCockpit is connected to the Light Driver 5.0, all configurations carried out in LightCockpit are immediately displayed on the Light Driver 5.0 (Live mode).
4. If you want the configurations carried out to remain on the Light Driver 5.0 permanently (after a restart), you will need to save them before terminating the USB connection. To do this, click on the Download icon in the top right-hand corner of the Lightcockpit interface. Yellow means "Warning, unsaved changes"; white means "All OK".
5. Have Fun! The Light Driver 5.0 cannot be damaged due to incorrect manipulation in LightCockpit. Thanks to the permanent "Live mode", all changes are visible immediately.
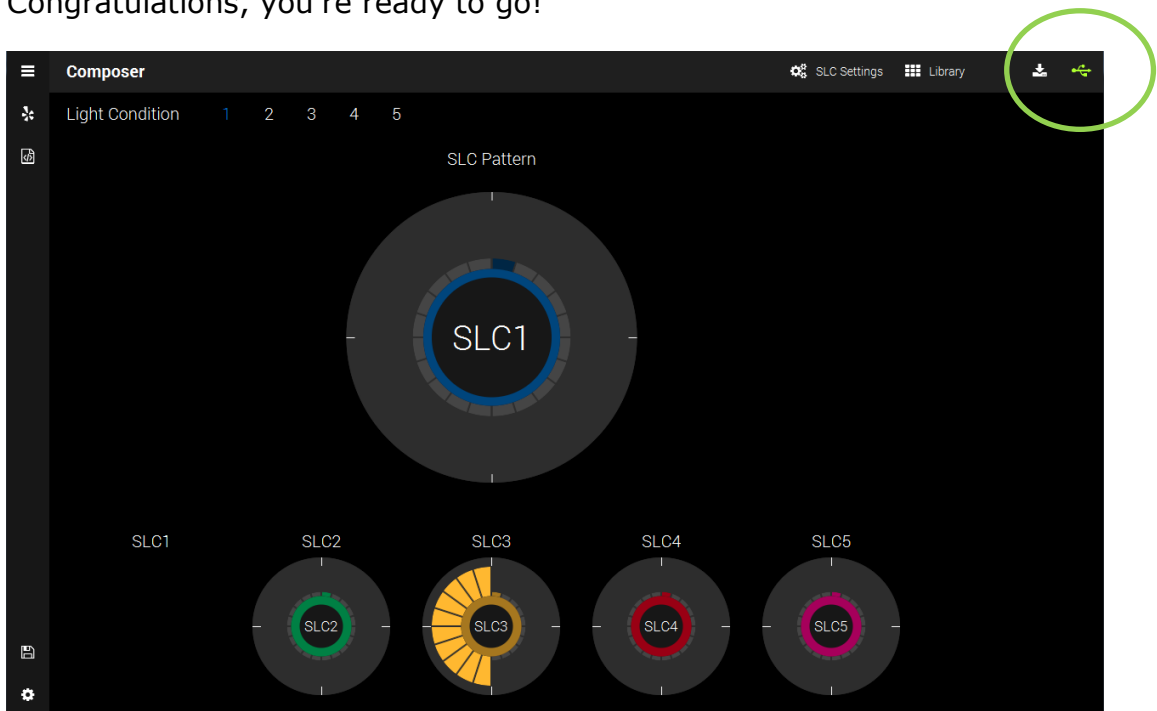
Starting Lightcockpit:

The red USB icon in the top right-hand corner indicates that no connection with a Light Driver 5.0 has been established.
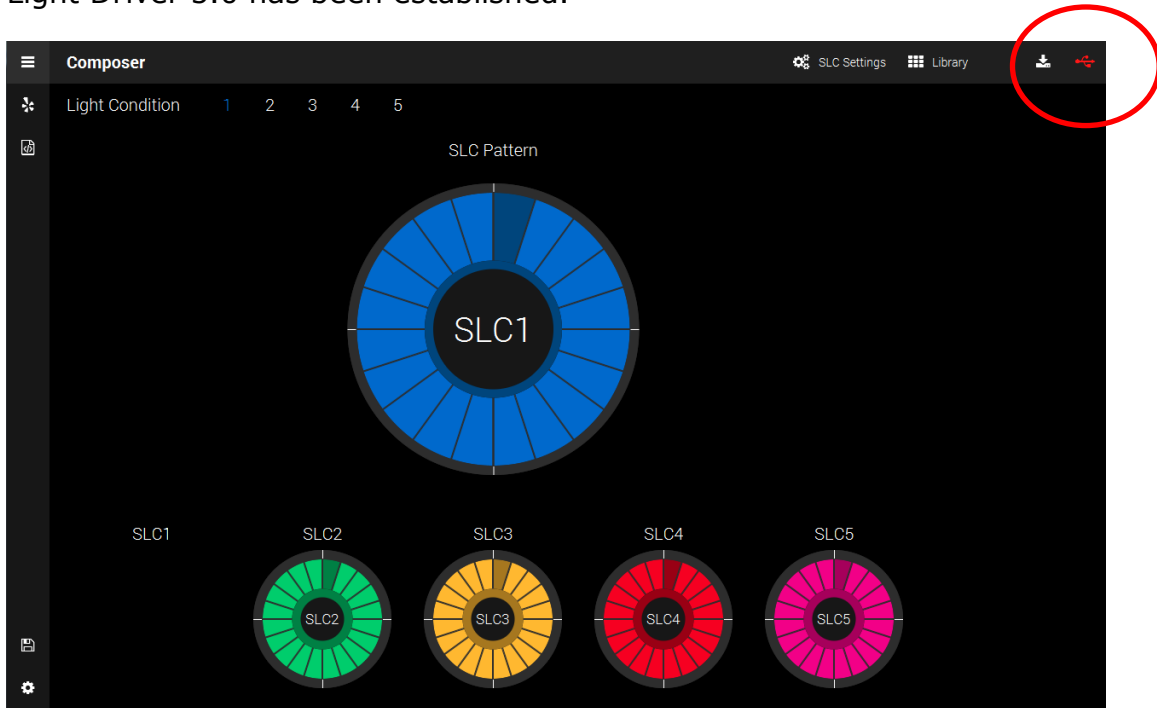
Connect the Light Driver 5.0 via USB:

The first time you plug in, it can take several moments for the necessary drivers to be installed. Once the installation has been carried out successfully, the USB icon turns green and indicates an active USB connection with the Light Driver 5.0. The configuration of the Light Driver 5.0 is automatically loaded in LightCockpit.

Congratulations, you're ready to go!

Individual programming with LightCockpit | Details

Composer

The Composer is the main element of LightCockpit. It is always active after start-up. Click on the Composer icon to select it manually. The Composer enables you to configure the Patterns of the 5 SLCs as well as carry out SLC specific configurations (SLC Settings). The SLC Settings are configured by SLC channel (SLC1-5).

The Light Driver 5.0 features 5 Light Conditions.
For each Light Condition, all 5 SLC Patterns can be fully programmed individually.
The Light Conditions can be called up via the RC channel (similar to the flight conditions).

Pattern of SLCs 1-5. To edit, drag and drop the segments and configure the desired pattern.
The lengths of the segment coincides with the brightness. Rotate the circle to create time shifts.
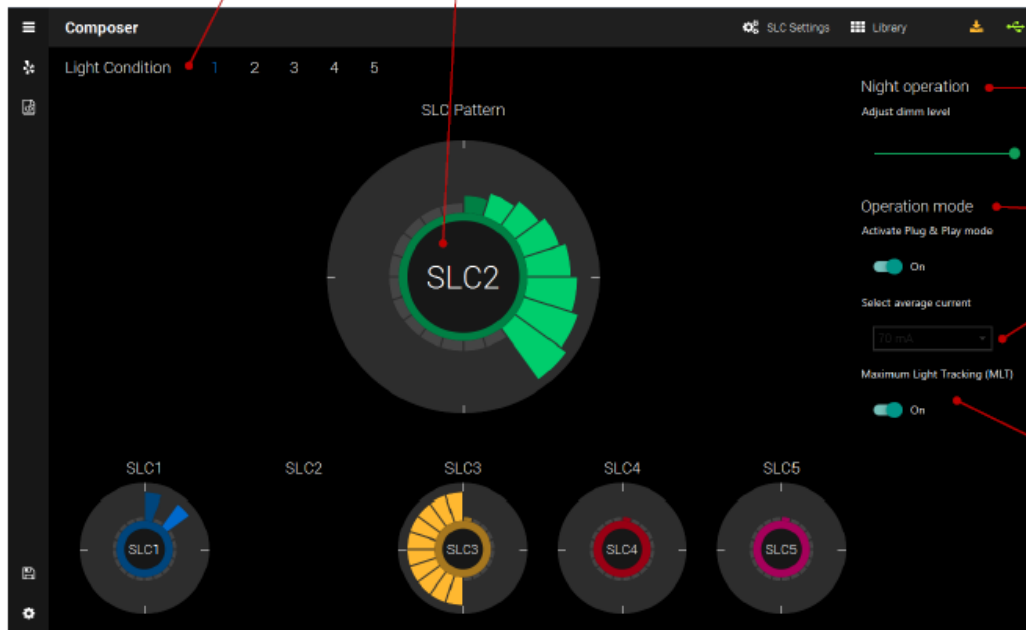
A Dimm Level can be configured for each SLC.

The active Plug&Play mode enables automatic recognition of innoflyer aircraft LED light. A LED current coinciding with the design is configured automatically.
If third-party LEDs are used, Plug&Play must be deactivated.

In order to guarantee the safe operation of third-party LEDs, when the Plug&Play mode is deactivated, constant current must be selected for the SLC.

If MLT is activated in combination with an innoflyer aircraft LED light, the LED connected to the SLC is supplied with maximum power instead of being supplied with power depending on its design. The temperature of the LED is constantly measured and, in case of excess heat, the power is reduced slightly.
->Improved cooling, brighter LED

⚠️ **Important information regarding the SLC Settings**

When using innoflyer aircraft LED lights in an active Plug&Play mode (with or without an active MLT), le Light Driver 5.0 automatically operates the LEDs with the correct current and carries out thermal monitoring.
If you are using Third-Party LEDs or old innoflyer light sources from the A2 series, you will need to switch the Plug&Play mode off and select the LED current manually. If by accident you forget to deactivate the Plug&Play mode, the Light Driver 5.0 will operate all non-system LEDs with a minimum current of 70mA.

Library

The "Presets" section of the Library features a selection of many frequently used flash patterns. The "User" section enables you to manage your own creations and to pull them up at the click of a button.
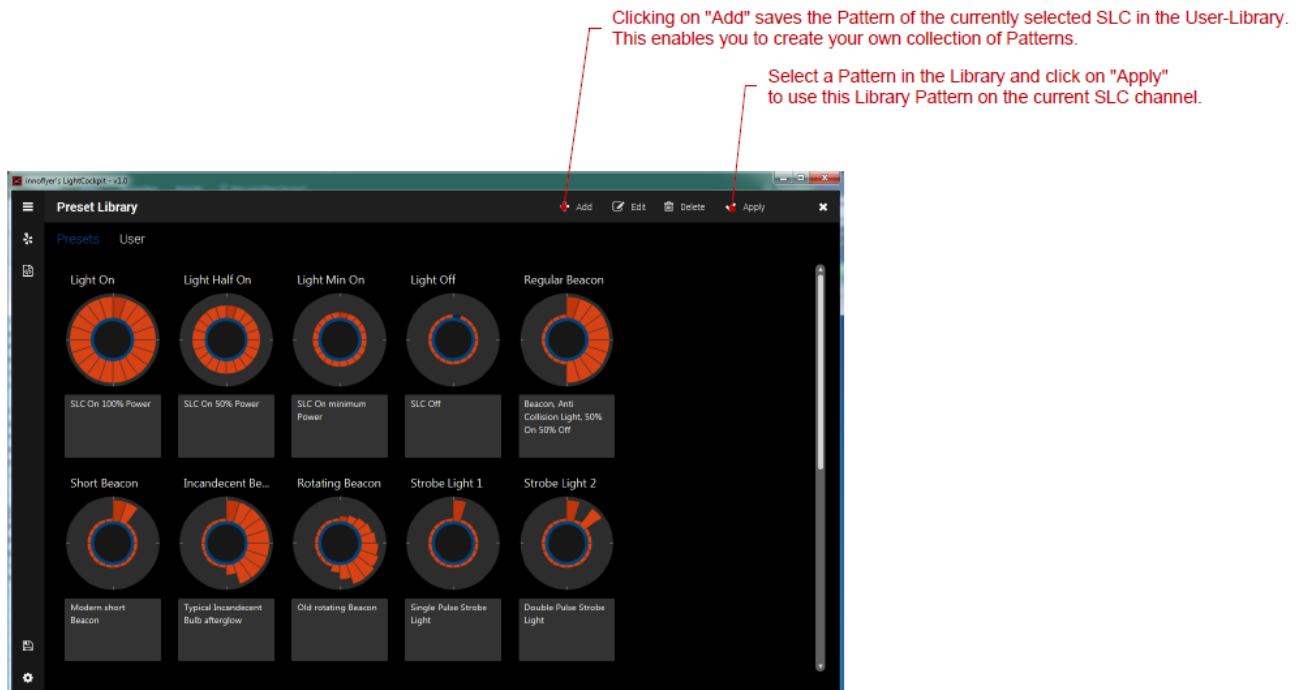
General Settings

Click on the ⚙ symbol to open the settings of the Light Driver 5.0.

Device Name	Give the connected Light Driver 5.0 a name.
Light Condition Control mode	Determine how you want to switch between the 5 Light Conditions via RC-Control. The **"Static"** variant divides the -100% to +100% channel paths into 40% segments. An active Light Condition is permanently assigned to each segment. Your computer transmitter enables you to approach these segments in a variety of ways. The **"Dynamic"** variant enables you to call up all 5 Light Conditions with a simple 3-way switch. Programm it as follows: Pos0: -100% Centre: 0% Pos1: +100%. Toggle **Centre-Pos1-Centre** in order to move a Light Condition up (e.g. LC1 to LC2) or toggle **Centre-Pos0-Centre** in order to move a Light Condition down (e.g. LC5 to LC4). If you remain in Pos1 for more than 2 seconds, Light Condition 5 will automatically become active. If you remain in Pos0 for more than 2 seconds, Light Condition 0 will automatically become active.
Under-voltage Alarm (UVA)	The under-voltage alarm enables you to monitor the lighting battery. The "Under Voltage Alarm Level" enables the continuous setting of the under voltage alarm level. An alarm goes off (fast blinking) on the UVA, on the SLC selected under "Under Voltage Alarm Channel". In order to reset a UVA, you need to restart the Light Driver 5.0.
Night operation preview	Upon activating the Night Operation Preview, all SLCs are reduced to the Dimm Level, which is preconfigured in the SLC Settings of each channel. This enables you to "preview" how bright the LEDs are when Night Operation is activated. If the Light Driver 5.0 is disconnected from the USB, this Preview is automatically reset. In order to activate Night Operation on land/in flight, the Light Driver 5.0 must be connected to an RC-channel that can be operated with a 3-way switch. Night Operation is activated with the following sequence on the 3-way switch: **Centre-Pos0-Centre-Pos1-Centre-Pos0-Centre-Pos1-Centre** (Channel direction: PWM Pos0 < PWM Centre < PWM Pos1) Use Night Operation to prevent lighting from being dazzling during twilight, for instance.

Standby Mode   If activated, the LD5.0 enters the standby mode if the RC
signal is shut down (PWM off) and switches all 5 SLC off. If
the RC signal is turned back on (PWM on), SLC 1-5 restart
immediately. Optionally a timeout can be selected. The
timeout delays the shut down of SLC 1-5 after the RC
signal is lost by the selected period of time.
If a UVA is set, it rests activated in active standby mode.

Load / Save Light Project

Click on the 💾 symbol to open the Load/Save dialog box. All the Light Cockpit settings can be saved in a project file here. By opening one of these files, you will call up a complete set of settings. This makes replacing a complete configuration of the Light Driver 5.0 very easy.

Firmware Updater

Click on the symbol to open the Firmware Updater. This enables you to keep Light Driver 5.0 up to date with new technologies. New versions of the Light Driver 5.0 Firmware are published at www.innoflyer.ch. Load the Firmware file onto your PC and open it with the "Load" button. Start the updating process by clicking on the "Update" button and follow the instructions.

⚠️

Never disconnect the Light Driver 5.0 while a Firmware update is in progress!

Expanding the system, Master-Slave operation

If your lighting project requires more than five aircraft LED lights, you can extend the system with up to two additional Light Drivers 5.0 (max. 3x5 = 15 users).

For this, configure each Light Driver 5.0 individually with LightCockpit. It does not matter whether they are to be used as Master or as Slave. All SLCs within a Master-Slave system are synchronised among themselves. Connecting a Light Driver 5.0 with the RC connection cable on the Slave 1 or Slave 2 outlet of another Light Driver 5.0 automatically turns it into a Slave. This is visible by the slow blinking of the State LED.

On all Slaves, "RC-Power" must be selected as a power supply (Jumper).

The Light Condition Control Mode of the Light Driver 5.0 used as a Master is valid for the entire Master-Slave system. The Slaves are controlled by the Master. This is regardless of how their Control Mode was configured. The same is valid for the configuration of the standby mode.

No additional Light Drivers 5.0 can be connected to the Slave outlets of a Slave.

A Master-Slave system can significantly reduce the cabling efforts in your model if you install Light Drivers 5.0 in each half of the wing.

Output LED State

The following system states of the Light Driver 5.0 are displayed by the State LED:

——......——......——......——......——......	Normal mode.
————......................————......................————	Slave mode.
——....——....——....——....——....——....——....——	A temperature limiter is active. The performance of at least one LED is reduced.
—..—..—..—..—..—..—..—..—..—..—..—..—..	Bootloader active, no valid Firmware found.
—........................—........................—............	Standby mode

Key: — LED is on, ... LED is off

Recycling

Electrical components shall not be thrown away with domestic waste; they must be disposed of in an appropriate and environmentally safe manner!
Please comply with national and regional waste disposal regulations. Electronic waste shall be sorted in keeping with the provided disposal systems.

Warranty

The warranty in accordance with the following provisions is 2 years, unless expressly agreed otherwise in writing.

The warranty period starts from the date of delivery. In case of failure to comply with our operating or maintenance instructions, alterations, the replacement of parts or the use of consumables that do not comply with the original specifications, the warranty will not apply as long as the defect can be traced back to this. This also applies if the defect can be traced back to improper use, storage and manipulation of the devices, third-party intervention or a fall. Minor deviations from the guaranteed characteristics of the goods do not trigger warranty rights.

Liability for normal use and parts subject to wear and tear is excluded.

In case of a defect of the purchased item for which raible eflugtechnik is responsible, raible eflugtechnik will be entitled to subsequent fulfillment (corrective action and replacement delivery). Should raible eflugtechnik be unable to rectify the defect within a suitable period, the contracting party will have recourse to the legal institutions of the Swiss Code of Obligations.

We are liable for our own faults and those of our legal representatives and employees only as far as the fault is intentional or due to gross negligence. This does not apply to lack of assured properties.

In case of commercial use of raible eflugtechnik products and services, in keeping with the Product Liability Act, no liability is accepted.

innoflyer by raible eflugtechnik

weissensteinstrasse 81

CH-4500 solothurn

Switzerland

Phone: 0041 32 623 19 68

info@innoflyer.ch

www.innoflyer.ch