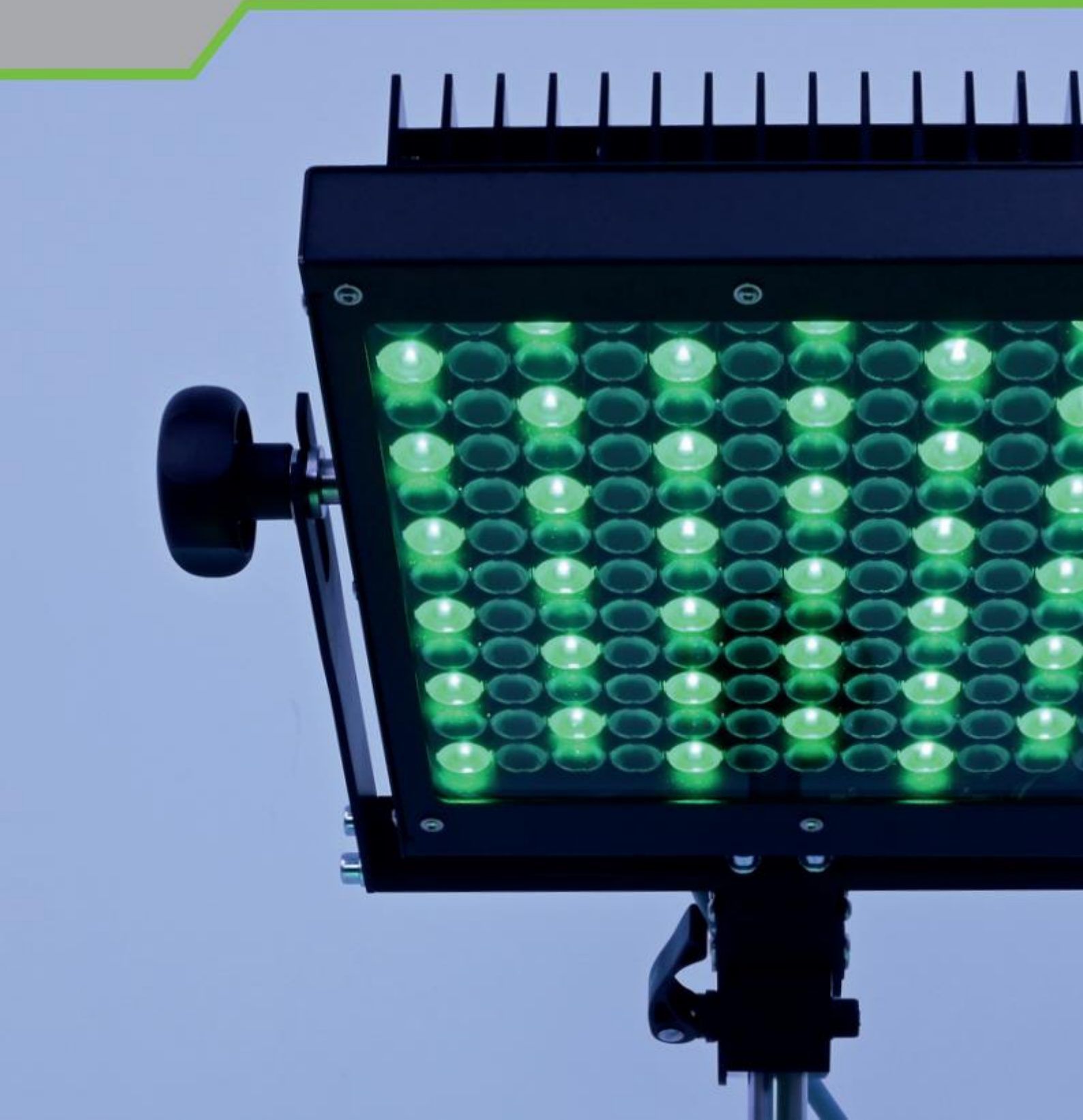
Instruction Guide

PHOTON SYSTEMS INSTRUMENTS

Light Controller LC 200

Please read the Guide before operating this product



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This document and its parts can be copied or provided to a third party only with the express permission of PSI.
The contents of this manual have been verified to correspond to the specifications of the device. However, deviations cannot be ruled out. Therefore, a complete correspondence between the manual and the real device cannot be guaranteed. The information in this manual is regularly checked, and corrections may be made in subsequent versions.
The visualizations shown in this manual are only illustrative.
This manual is an integral part of the purchase and delivery of equipment and its accessories and both Parties must abide by it

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1 SAFETY PRECAUTIONS

Read this manual carefully before operating the device. If you are not sure about something in the manual, contact the manufacturer for clarification.

	By accepting the device, the customer agrees to follow the instructions in this guide.

GENERAL CAUTIONS:

- Light Controller LC 200 is designed for sole control of the PSI LED Light Sources. Do not use it with any other device!
- When connecting the instrument modules, use only the cables supplied by the manufacturer!
- Keep the instrument dry and avoid working in high humidity environment!
- The manufacturer is not responsible for any damage due to improper or incompetent operation!!!

GENERAL ELECTRICAL SAFETY GUIDELINES:

- Routinely check the devices and their wiring.
- Replace worn or damaged cords immediately.
- Use electrical extension cords wisely and do not overload them.
- Place the devices on a flat and firm surface. Keep them away from wet floors and counters.
- Avoid touching the device, socket outlet or switch if your hands are wet.
- Do not perform any alterations to the electrical part of the devices or their components.

The following table presents basic highlight symbols used in this manual:

Symbol	Description
	Important information, read carefully.
	Complementary and additional information.

Tab. 1 Used Symbols

2 LIST OF EQUIPMENT

CAREFULLY UNPACK THE CARTON, WHICH CONTAINS:

- Light Controller LC 200
- Communication Cable
- This Operation Manual (on a CD or a printed version)
- Optional Accessories (according to your specific order)

	If any item is missing, please contact the manufacturer. Also check the carton for any visible external damage. If you find any damage, notify the carrier and the manufacturer immediately. In this case, the carton and all packing materials should be retained for inspection by the carrier or insurer.

For customer support, please write to: **support@psi.cz**

3 DEVICE DESCRIPTION

FRONT PANEL:

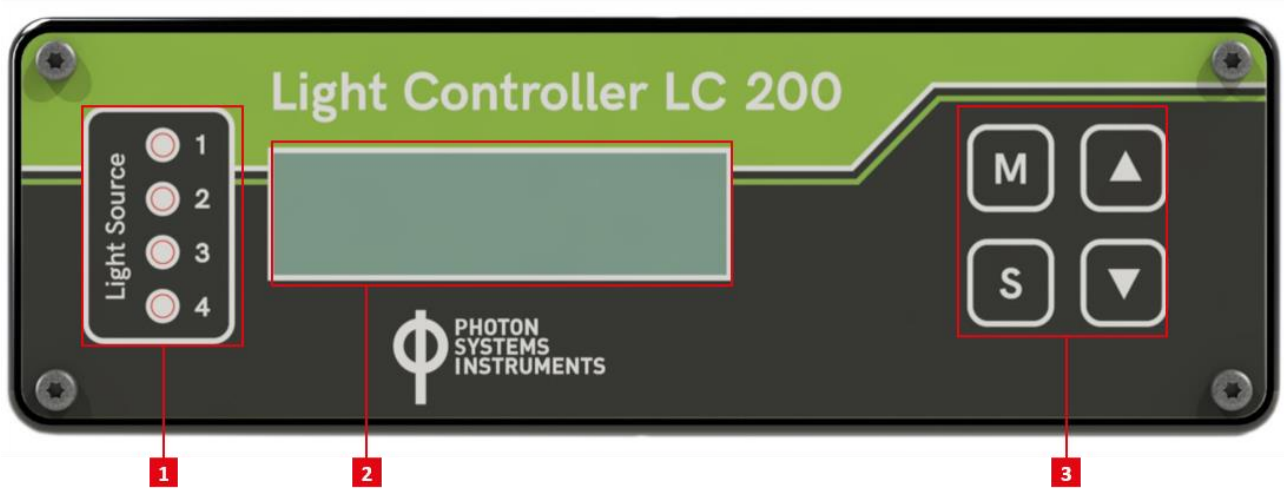


Fig. 1 Front Panel

[1] – Four LED indicators: on if the corresponding light is connected. [2] – Two-line display. [3] – Four control keys.

REAR PANEL:

Fig. 2 Rear Panel

[1] – ON/OFF mains switch. [2] – Power connector. [3] – Service connector. [4] – Light panel connector. The Light Controller automatically detects the connected LED Light Source(s). Each light /color can be configured and controlled independently.

4 DEVICE OPERATION

Light Controller LC 200 supports up to eight different channels i.e. it allows up to eight different protocols. Each light source can be configured and calibrated separately using their own written reports

For light control and protocol writing, use the following four keys located on the front panel:

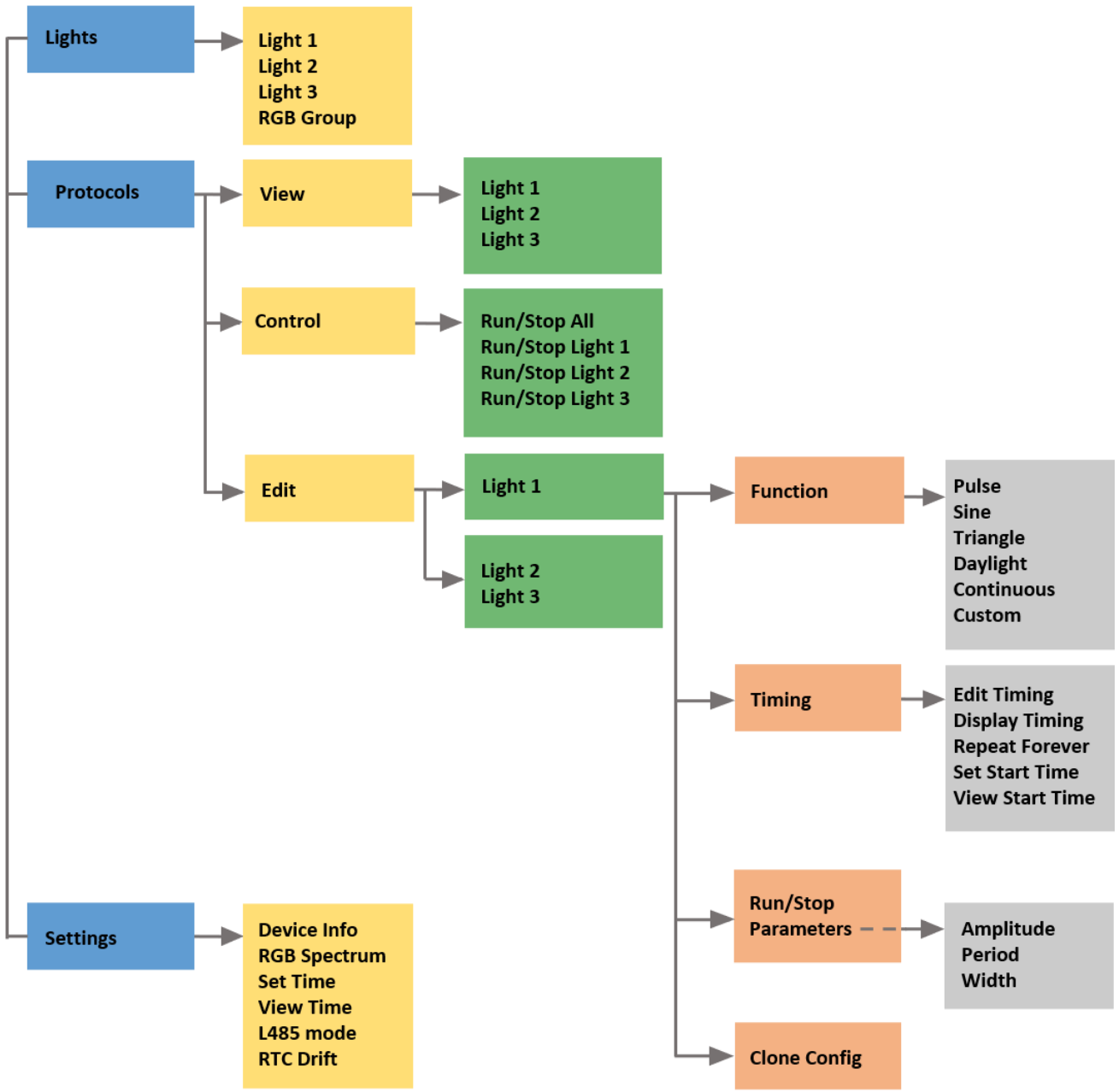
[M]: To move back in the menu tree or to exit the menu.

[S]: To move forward in the menu tree or to save your selection.

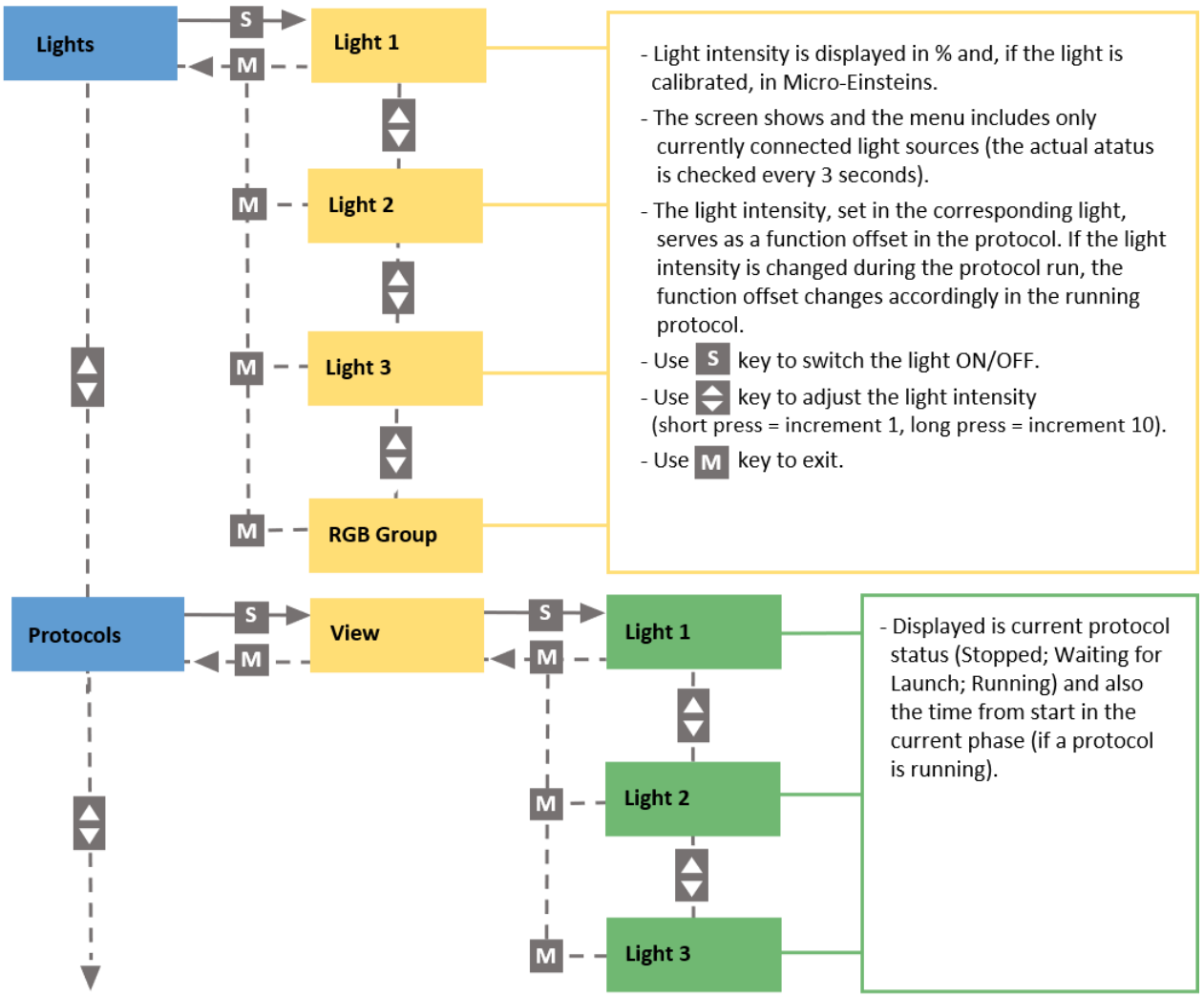
[↑]: To move up in the menu or to add value.

[↓]: To move down in the menu or to subtract value.

Menu Tree – Main



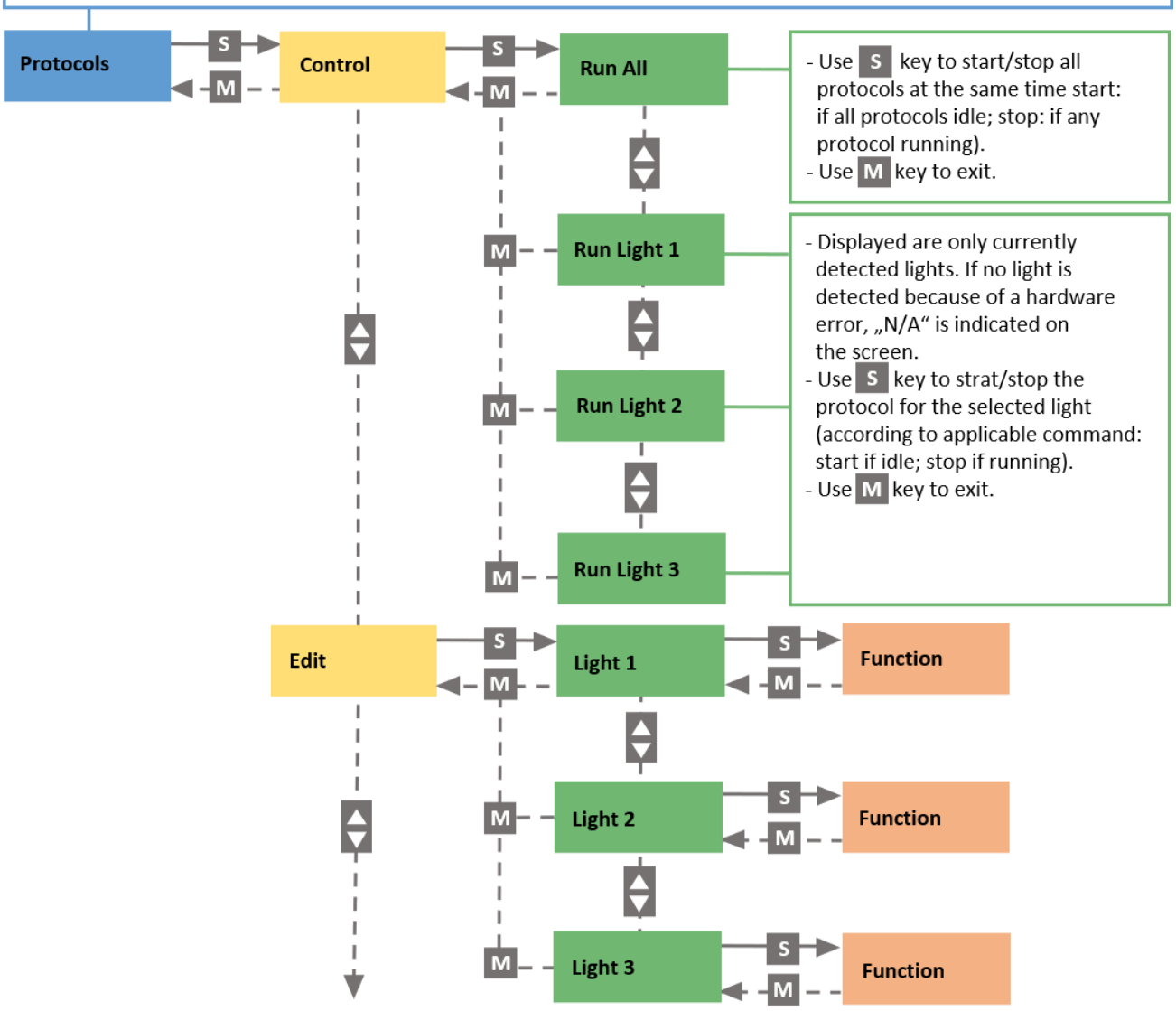
Menu Lights + Menu Protocols



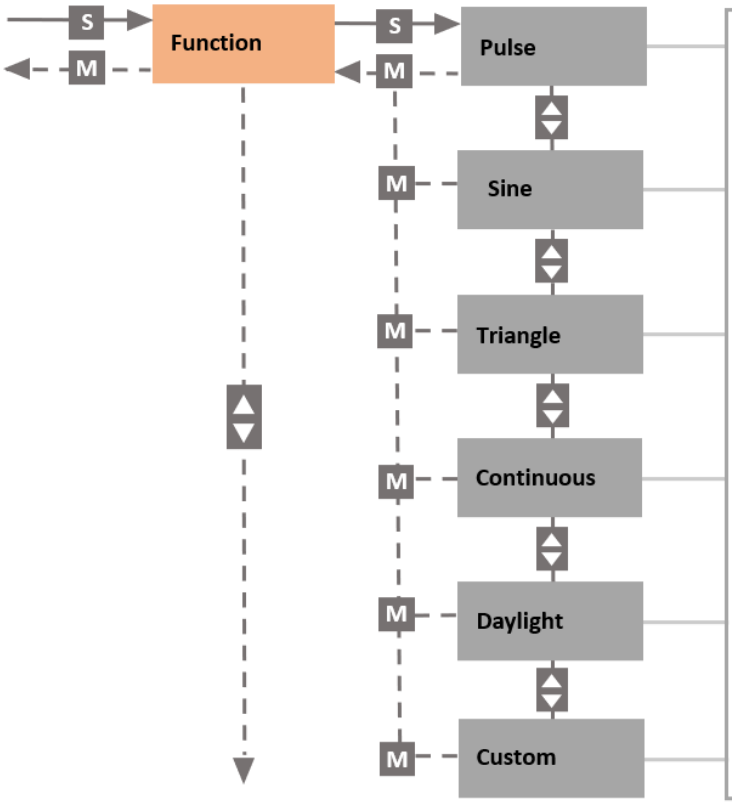
Menu Protocols → Control + Edit

EACH PROTOCOL CONSISTS OF THREE INDEPENDENTLY CONFIGURABLE PHASES:
1) Light Period (LP) = Time period during which the defined function is performed.
2) Dark Period (DP) = Time period during which the light is off.
3) Repeats = Number of repeats for the phase.

OTHER EDITABLE PROTOCOL FUNCTIONS:
Repeat forever = The whole protocol runs in infinite loop.
Zero phase = LP + DP = 0; or Repeats = 0. Editing of phases is finished when the Zero phase is confirmed.

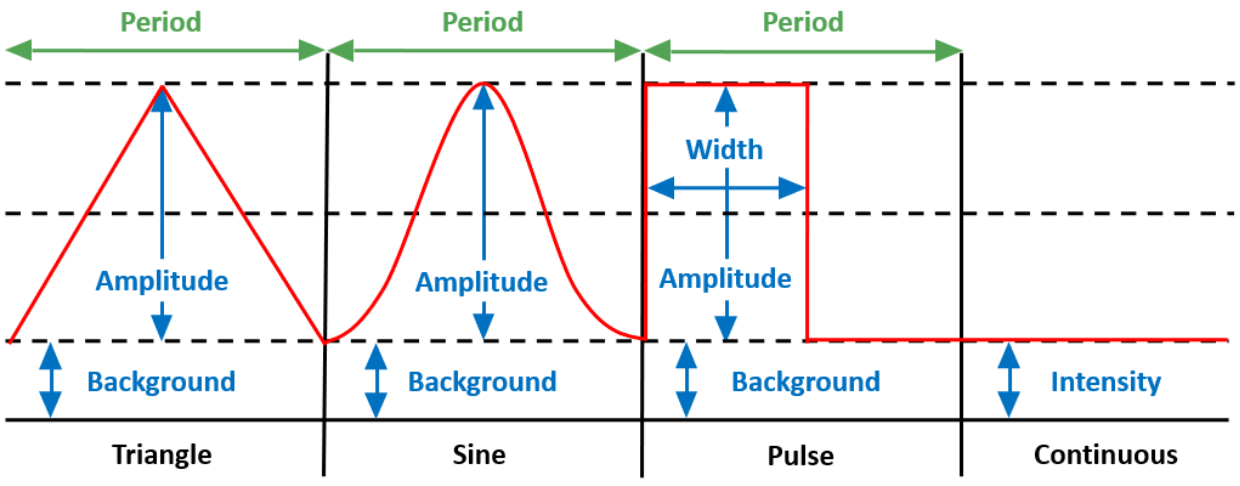


Menu Protocols → Edit → LightN → Function

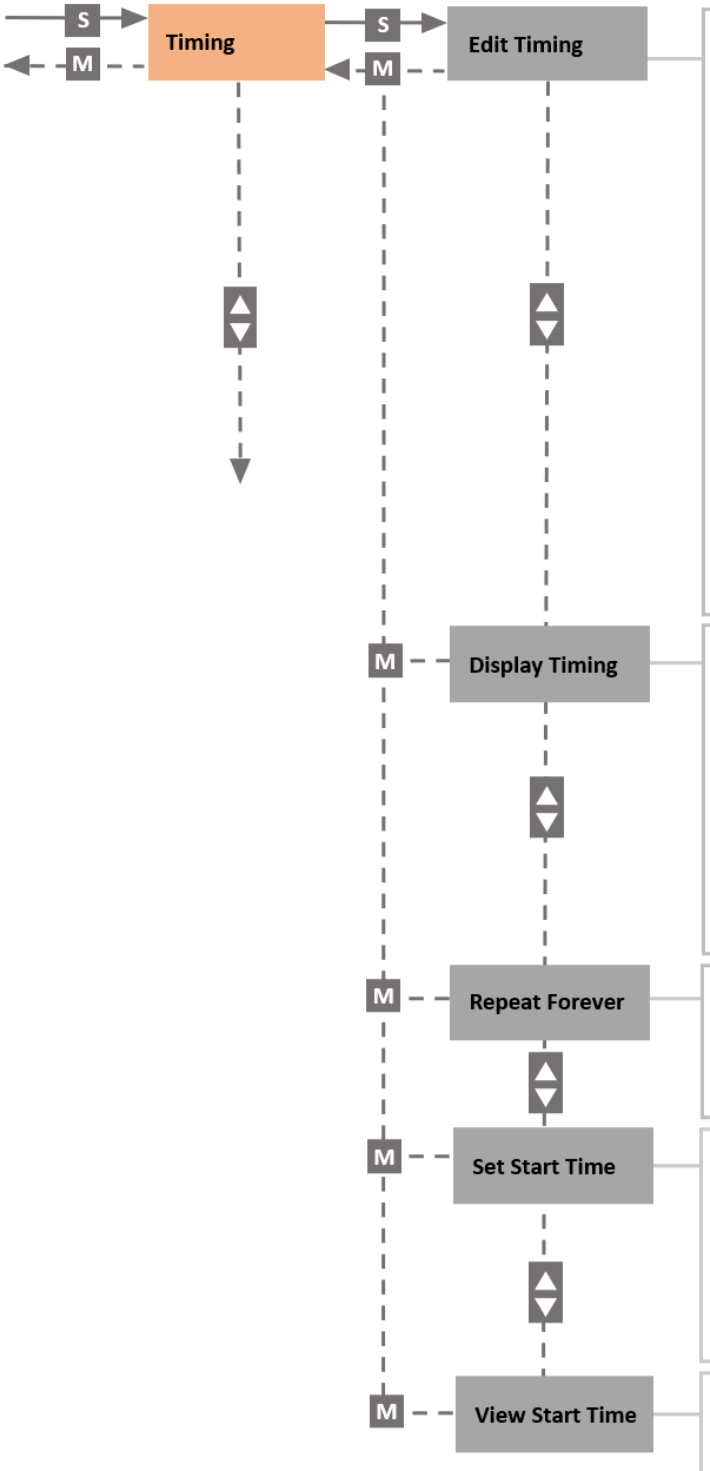


-AVAILABLE ARE SIX LIGHT FUNCTIONS: PULSE, SINE, TRIANGLE, CONTINUOUS, DAYLIGHT AND CUSTOM PROTOCOL.
-The choice of function influences active or inactive items in the menu (see figure below).
Amplitude is displayed when Sine, Triangle, Pulse and Continuous function is selected.
Period is displayed when Sine, Triangle and Pulse function is selected.
Width is displayed when Pulse function is selected.
- Daylight function serves for "cloudy sky" simulation. Programmable parameters are: offset, amplitude, period, drop rate and drop place.
- Ideal period setup (for daylight function) equals one light phase, i.e., one day coincides with one light phase of the protocol.
- Custom protocol allows to write own protocol using software on your PC.
- Custom protocol and Daylight are optional items and are present only if corresponding modules are included. Customer gets special guide for these items.

Light Function Visualization



Menu Protocols → Edit → LightN → Timing



FIVE INPUT VALUES CAN BE EDITED FOR PROTOCOL PHASE:

1. Phase LP-value = edit light period as a number value.
2. Phase LP units = edit light period in time units (s = second, m = minute, h = hour).
3. Phase DP value = edit dark period as a number value.
4. Phase DP units = edit dark period in time units (s = second, m = minute, h = hour).
5. Phase N repeats = number of repeats.

- If all 5 values for phase are set, the zero phase check is performed automatically.
- If "M" key for exit is used, then currently edited phase is zeroed.
- Use ▲▼ key for value change.
- Use S key to confirm and to go to next step.
- Use M key to exit (no save).

FOR VIEWING PREVIOUSLY DEFINED PROTOCOL PHASE:

- Example and explanation of a displayed phase definition:

Phase
L11s D 2s 3x
where: L11 = light (light ON) for 11 seconds
D2s = dark (light OFF) for 2 seconds
3x = number of repeats for this phase

- Use M key to exit.

FOR INFINITE PROTOCOL REPETITION:

- Use S key to opt for YES or NO.
- Value is saved immediately.
- Use M key to exit.

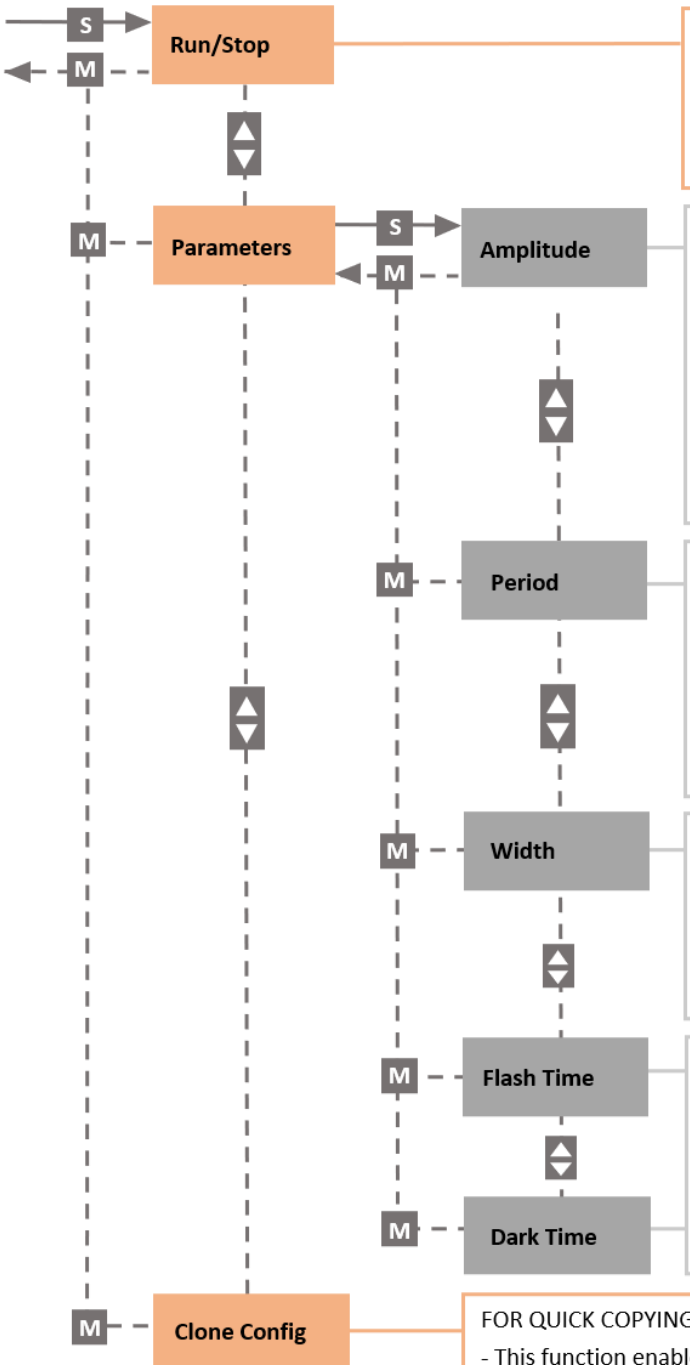
FOR DELAYED PROTOCOL START:

- Write your protocol then set its start date.
- Start the protocol. If Start Date is in the past, execution of the protocols is resumed as if it was started at Start Date. If Start Date is in the future, protocols wait until Start Date is reached.

FOR VIEWING PRESET DATA OF THE DELAYED PROTOCOL:

- If no preset data, N/A is displayed.

Menu Protocols → Edit → LightN → Run/Stop... Clone Config



FOR PROTOCOL STARTING OR STOPPING:
(shortcut to: Protocols > Run > Run/Stop LightN)
- Use S key to start/stop the protocol.
- Use M key to exit

FOR AMPLITUDE MODULATION:
- Use ▲▼ key to adjust the amplitude value in %.
If the light is calibrated, the amplitude value can be set also in Micro-Einsteins.
- Amplitude value is blinking if: *Amplitude + Offset (light intensity) > 100 %.*
- Use S key to save the value and to exit.
- Use M key to exit (no save).

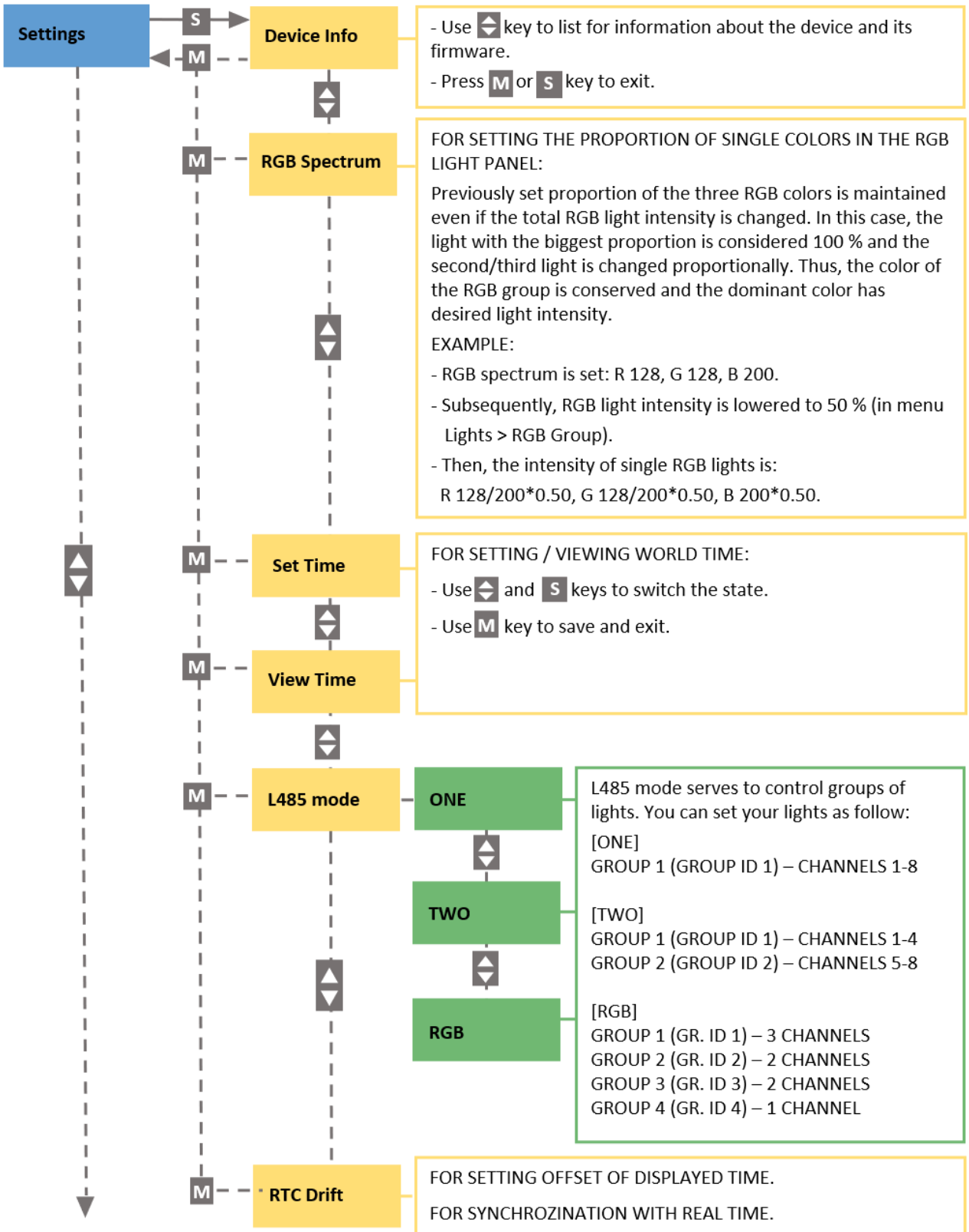
FOR LIGHT PERIOD MODULATION:
- Use ▲▼ key to set the light period in two steps:
1) Adjust the value.
2) Select time units (s = seconds, m = minutes, h = hours).
- Use S key to save the value and to exit.
- Use M key to exit (no save).

FOR SETTING WIDTH (IN THE PULSE FUNCTION):
- Use ▲▼ key to set width in the Pulse function (in % from the light period).
- Use S key to save the value and to exit.
- Use M key to exit (no save).

Flash Time and Dark Time is displayed in µs Pulse function.
Flash Time – time period during which the light is ON.
Dark Time – time period during which the light is OFF.
Values are set in ms or µs.

FOR QUICK COPYING OF PREVIOUSLY SET FUNCTIONS:
- This function enables copying light setup (protocol function, parameters and timing) from selected light to any other light.

Menu Settings → Device Info … RTC Drift



5 L485 MODE

LC 200 device, version for 485 lights (FytoPanels), uses hard-wired GroupID / Channel to Light number assignment. Therefore it is necessary to configure FytoPanels GroupIDs carefully before connecting them to LC 200.

Assignment tables for different 485 modes are following:

LC 200	FytoPanel	
Light Nr	**GroupID**	**Channel**
1	1	1
2	1	2
3	1	3
4	2	1
5	2	2
6	3	1
7	3	2
8	4	1

Tab. 2 L485 Mode RGB

LC 200	FytoPanel	
Light Nr	**GroupID**	**Channel**
1	1	1
2	1	2
3	1	3
4	1	4
5	2	1
6	2	2
7	2	3
8	2	4

Tab. 3 L485 Mode Two

LC 200	FytoPanel	
Light Nr	**GroupID**	**Channel**
1	1	1
2	1	2
3	1	3
4	1	4
5	1	5
6	1	6
7	1	7
8	1	8

Tab. 4 L485 Mode One

LC 200 Lights 1-3 are designed for use with 3-Channel RGB FytoPanel, as LC 200 has RGB spectrum support on this 3 channels. Other Light positions do not have any special functions and can be assigned anyhow.

Example of RGB and WhiteIR panels setup:
Available panels are: 3x RGB, 2x WhiteIR and 10x White. RGB panels need to be controlled separately and by color, WhiteIR as well and White panels need to be controlled in two groups.

Steps to setup the FytoPanels:
1. Connect all the panels to PC.
2. Scan bus to map device network.
3. Change GroupID of all RGB (3 channel) devices to 1 by selecting corresponding devices in *TreeView*, changing GroupID to 1 and confirming by *Set* button.
4. Change GroupID of all WhiteIR panels to 2.
5. Change GroupID of 5 of the White panels to 3.
6. Change GroupID of other 5 of the White panels to 4.
7. Enable *DisplayGroups* check box and check if the Groups contain desired lights.

When connected to the LC 200, FytoPanel channels will be mapped to Lights in following way:

LC 200	**FytoPanel**
Light Nr	**Channel**
1	RGB - Red
2	RGB - Blue
3	RGB - Green
4	WhiteIR - White
5	WhiteIR - IR
6	White
7	N/A
8	White

Tab. 5 FytoPanel channels mapping

6 STATEMENT OF LIMITED WARRANTY

- This Limited Warranty applies only to the Light Controller LC 200. It is valid one year from the date of shipment.
- If at any time within this warranty period the instrument does not function as warranted, return it and the manufacturer will repair or replace it at no charge. The customer is responsible for shipping and insurance charges (for the full product value) to PSI. The manufacturer is responsible for shipping and insurance on return of the instrument to the customer.
- No warranty will apply to any instrument that has been (i) modified, altered, or repaired by persons unauthorized by the manufacturer; (ii) subjected to misuse, negligence, or accident; (iii) connected, installed, adjusted, or used otherwise than in accordance with the instructions supplied by the manufacturer.
- The warranty is return-to-base only, and does not include on-site repair charges such as labor, travel, or other expenses associated with the repair or installation of replacement parts at the customer's site.
- The manufacturer repairs or replaces faulty instruments as quickly as possible; the maximum time is one month.
- The manufacturer will keep spare parts or their adequate substitutes for a period of at least five years.
- Returned instruments must be packaged sufficiently so as not to assume any transit damage. If damage is caused due to insufficient packaging, the instrument will be treated as an out-of-warranty repair and charged as such.
- PSI also offers out-of-warranty repairs. These are usually returned to the customer on a cash-on-delivery basis.
- Wear & Tear Items (such as sealing, tubing, padding, etc.) are excluded from this warranty. The term Wear & Tear denotes the damage that naturally and inevitably occurs as a result of normal use or aging even when an item is used competently and with care and proper maintenance.

For customer support, please write to: support@psi.cz