

visual engineering
LIGHTWARE

User's Manual



RAP-B511-EU -K, -W, -S
RAP-B511-UK -K, -W, -S
RAP-B511-US -K, -W, -S

Room Automation Panel

Important Safety Instructions

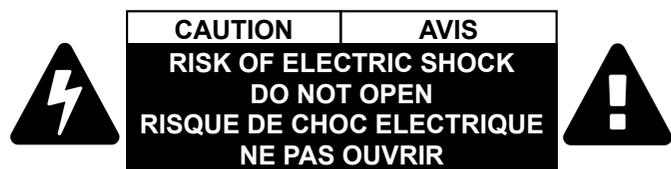
Class II apparatus construction.

The equipment should be operated only from the power source indicated on the product

To disconnect the equipment safely from power, remove the power cord from the rear of the equipment, or from the power source. The MAINS plug is used as the disconnect device, the disconnect device shall remain readily operable.

There are no user-serviceable parts inside of the unit. Removal of the cover will expose dangerous voltages. To avoid personal injury, do not remove the cover. Do not operate the unit without the cover installed.

The appliance must be safely connected to multimedia systems. Follow instructions described in this manual.



Ventilation

For the correct ventilation and to avoid overheating ensure enough free space around the appliance. Do not cover the appliance, let the ventilation holes free and never block or bypass the ventilators (if any).

WARNING

To prevent injury, the apparatus is recommended to securely attach to the floor/wall or mount in accordance with the installation instructions. The apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus. No naked flame sources, such as lighted candles, should be placed on the apparatus.

Waste Electrical & Electronic Equipment WEEE

This marking shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources. Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling. Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal.



The Handling of the Batteries

Use only standard batteries. Do not use new and used batteries together. This may cause a battery to break or leak and may cause fire, injury, or contamination (damage). When replacing the batteries, insert them with right polarity. Otherwise, the battery may become damaged or it may cause fire, personal injury or damage due to leakage of the internal liquid. The batteries (and rechargeable batteries) are not ordinary refuse and must be returned for recycling purposes. The customer is responsible for returning the used or rechargeable batteries for recycling. Be careful that children do not place the batteries in their mouths when removed from the remote control. Place the battery in a location that children or infants cannot reach.

Correct Disposal of Batteries in this Product

This marking on the battery indicates that the batteries in this product should not be disposed of with other household waste at the end of their working life. Where marked, the chemical symbols Hg, Cd or Pb indicate that the battery contains mercury, cadmium or lead above the reference levels in EC Directive 2006/66. If batteries are not properly disposed of, these substances can cause harm to human health or the environment. To protect natural resources and to promote material reuse, please separate batteries from other types of waste and recycle them through your local, free battery return system.

Common Safety Symbols

Symbol	Description
	Direct current
	Alternating current
	Double insulation
	Caution, possibility of electric shock
	Caution

Symbol Legend

The following symbols and markings are used in the document:

WARNING! Safety-related information which is highly recommended to read and keep in every case!

ATTENTION! Useful information to perform a successful procedure; it is recommended to read.

INFO: A notice which may contain additional information. Procedure can be successful without reading it.

DEFINITION: The short description of a feature or a function.

TIPS AND TRICKS: Ideas which you may have not known yet but can be useful.

Navigation Buttons

 Go back to the previous page. If you clicked on a link previously, you can go back to the source page by clicking the button.

 Navigate to the Table of Contents.

 Step back one page.

 Step forward to the next page.

Document Information

All presented functions refer to the indicated products. The descriptions have been made during testing these functions in accordance with the indicated Hardware/Firmware/Software environment:

Item	Version
Lightware Device Controller (LDC) software	v1.33.1b1
Lightware Device Updater2 (LDU2) software	v.2.0.0
Controller firmware package version	v1.0.2b2
Hardware	1.0

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About Printing

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- Page size: A4
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- Orientation: Landscape

TIPS AND TRICKS: Thanks to the size of the original page, a border around the content (gray on the second picture below) makes it possible to organize the pages better. After punching the printed pages, they can be placed easily into a ring folder.

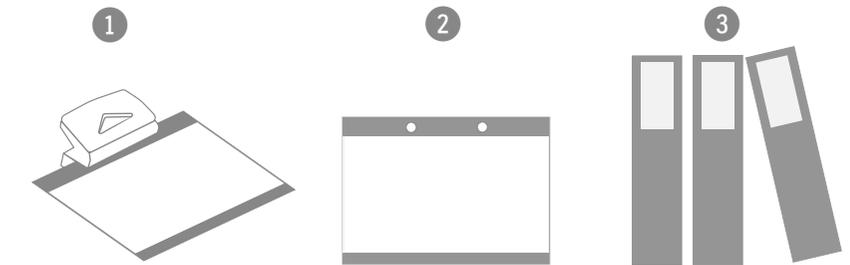


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1

Introduction

Thank you for choosing Lightware's RAP-B511 series device. In the first chapter we would like to introduce the device highlighting the most important features in the below listed sections:

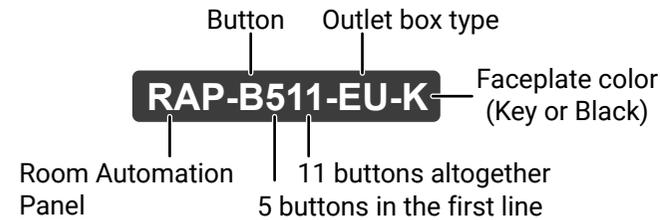
- ▶ DESCRIPTION
- ▶ MODEL COMPARISON
- ▶ BOX CONTENTS
- ▶ COMPATIBLE DEVICES
- ▶ FEATURES OF THE DEVICE
- ▶ TYPICAL APPLICATION

1.1. Description

Room Automation Panel is an integrated control solution for AV systems installed in collaborative spaces. It features a programmable keypad, a volume knob, and a processor running Lightware Event Manager.

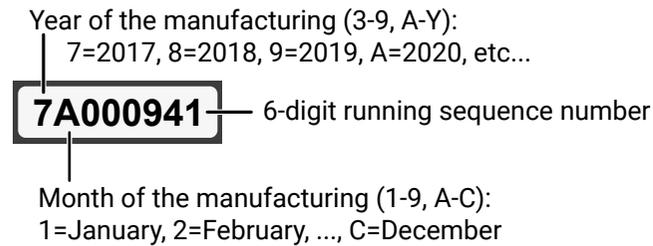
The stylish unit is available in different sizes and colors which fit EU, US and UK electrical boxes and tabletop enclosures. Rear panel RS-232, 3xGPIO and 2xRJ-45 ports provide connection to controlled devices. Snap-on front cover and PoE receiver of the first RJ-45 connector make the installation smooth. The additional RJ-45 connector makes cabling flexible and can supply PoE when an AC adapter is plugged in.

Model Denomination



About the Serial Number

Lightware devices contain a label indicating the unique serial number of the product. The structure is the following:



1.2. Model Comparison

INFO: All the models have the same look and functionality, the only difference is the size and color of the enclosure.

Model name	Color	Outlet box type
RAP-B511-EU-K	black	Double EU wall box (65mm)
RAP-B511-EU-W	white	
RAP-B511-EU-S	brushed steel	
RAP-B511-UK-K	black	Double UK wall box
RAP-B511-UK-W	white	
RAP-B511-UK-S	brushed steel	
RAP-B511-US-K	black	Double US wall box
RAP-B511-US-W	white	
RAP-B511-US-S	brushed steel	

1.3. Box Contents



¹ The transparent caps are not placed onto the buttons, thus, you can easily insert the desired labels and fix the caps – see the related section.

1.4. Compatible Devices

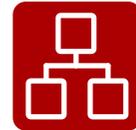
Room automation panel has standard RS-232, Ethernet, GPIO ports which are compatible with other Lightware products or third-party devices which have the same signal type.

1.5. Features of the Device



Front panel buttons and rotary knob

Integrated keypad with 11 programmable backlight buttons. Volume rotary knob to control Lightware devices, TVs or Power Amplifiers volume.



Ethernet Control

Multiple simultaneous TCP/IP connections are available with a simple ASCII-based protocol for controlling, configuring the device or perform a firmware upgrade.



Built-in Mini Web

The Miniweb is able to display an adaptive surface of a virtual front panel, advanced web page displays buttons for Event manager Actions.



Remote Power

The RAP-B511 is PoE-compatible and can be powered locally by the supplied power adaptor, or remotely via the TPS connection (through the CATx cable) with a compatible power source equipment, e.g. MMX6x2-HT series matrix switchers and TPS2 matrix boards.



Bi-directional RS-232 Pass-through

AV systems can also contain serial port controllers and controlled devices. Serial port pass-through supports any unit that works with standard RS-232.



RS-232 Recognizer

Support recognizing incoming RS-232 messages to integrate with 3rd party devices or Lightware units.



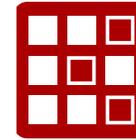
GPIO Control Port

3 GPIO pins operating at TTL digital signal levels and can be controlled with both LW2 and LW3 commands.



Infra

Infrared (IR) is a wireless technology used for device communication over short ranges. Third party control systems may send IR control commands to endpoints turning them on and off or switching their inputs.



LDC

The Lightware Device Controller (LDC) application keeps receiving upgrades, adding new features and tools. The latest edition of LDC has gotten more intuitive, user friendly, smarter and has a modern user interface. The LDC is available for both Windows and macOS operating systems.



Built-in Event Manager

The Event Manager tool takes care of all the necessary control in a smaller configuration by performing predefined actions in response to device status changes. Hence, in a less complex environment, there is no need to invest in additional control solutions, which makes the receiver the best choice for numerous applications.

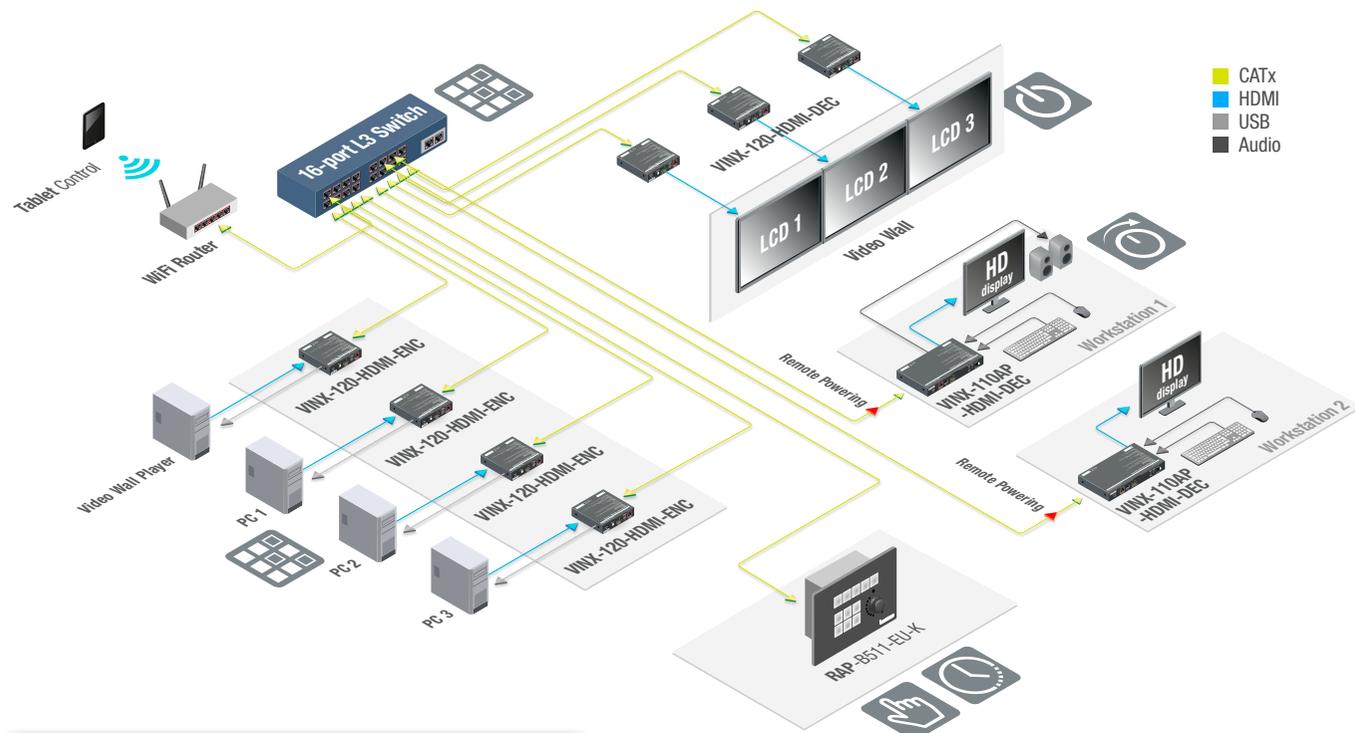


Real-time clock

Real-time clock with network time protocol and automatic daylight saving adjustment for Event Manager scheduling.

1.6. Typical Application

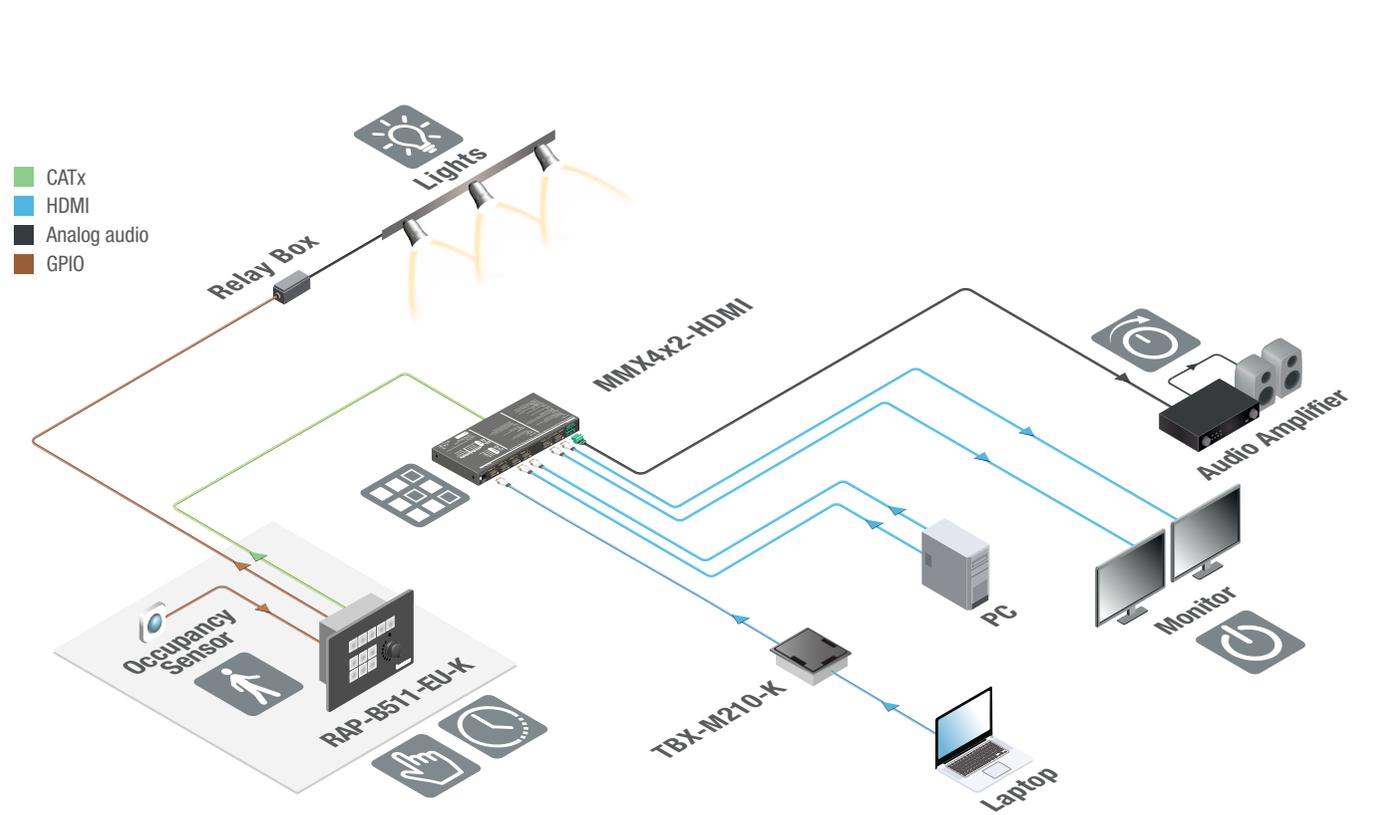
VINX Application Example



- CATx
- HDMI
- USB
- Audio

Conditions		Actions	
	Button Process		Source Switching
	Scheduling		Display / Projector On / Off
			Volume

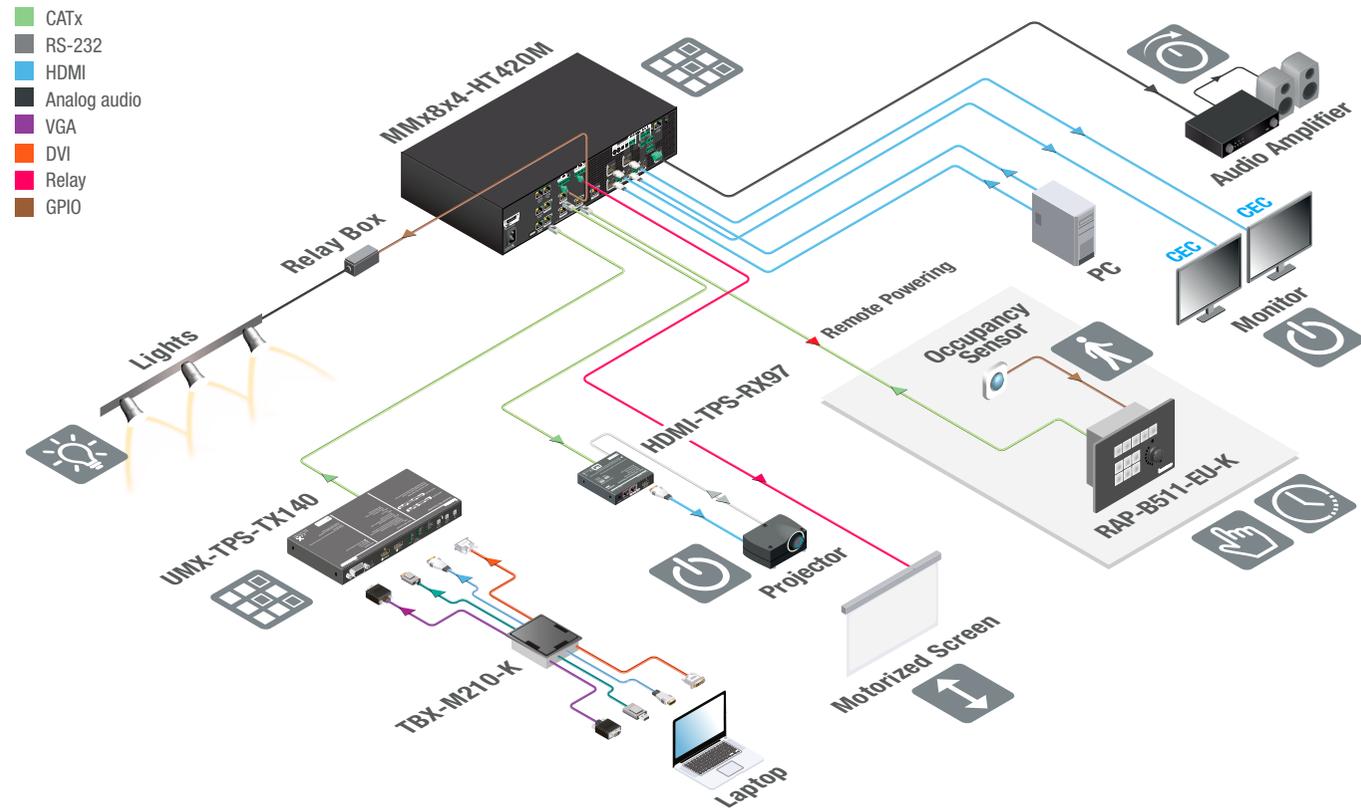
Meeting Room Application Example



- CATx
- HDMI
- Analog audio
- GPIO

Conditions		Actions	
	Button Process		Source Switching
	Scheduling		Display / Projector On / Off
	Occupancy Sensor		Lamp On / Off
			Volume

Conference Room Application Example



Conditions		Actions	
	Button Process		Source Switching
	Scheduling		Display / Projector On / Off
	Occupancy Sensor		Lamp On / Off
			Screen Up / Down
			Volume

2

Installation

The chapter is about the installation of the device and connecting to other appliances, presenting also the mounting options and further assembly steps:

- ▶ [MOUNTING OPTIONS](#)
- ▶ [POWERING OPTIONS](#)
- ▶ [CONNECTING STEPS](#)

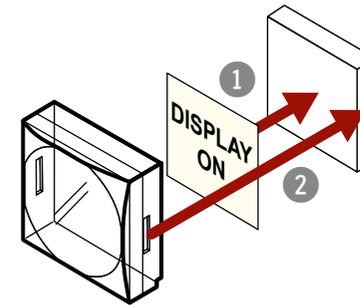
2.1. Mounting Options

2.1.1. Label and Cap Fixation

The caps of the buttons are supplied separately with the product in a plastic bag. Select the desired label and insert it as shown in attached figure:

Step 1. Insert the label.

Step 2. Place the cap and pay attention to the nut; the direction of the buttons are different, thus, certain caps must be rotated by 90°.



2.1.2. Compatible Outlet Box Types

The room automation panel can be easily mounted into an industrial standard switch/outlet box. See more details about the exact sizes of the device in the [Mechanical Drawings](#) section.

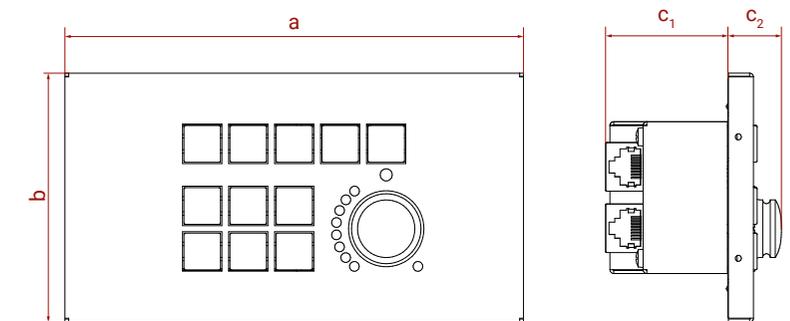
Model name refers to the box type, see the recommended box types for the models in the table below:

Model	Outlet box type
RAP-B511-EU	Double EU wall box (65mm) (e.g. Legrand: 0 801 22, 0 800 52, 2x0 801 51, 2x0 801 61, 0 819 42)
RAP-B511-UK	Double UK wall box (e.g. Appleby SB628 Galvanised Steel Knockout boxes 2G 47mm)
RAP-B511-US	Double US wall box (e.g. Carlon B225R-UPC Switch/Outlet Box, 2-Gang, Depth: 2-3/4")

INFO: The outlet box is not supplied with the product, it can be purchased from the local hardware store.

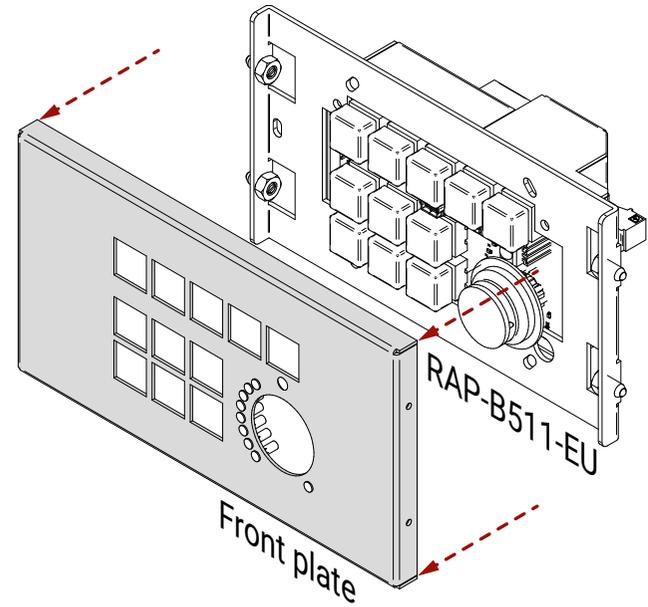
2.1.3. Dimensions

Model	Dimensions (mm)			
	a	b	c ₁	c ₂
RAP-B511-EU	152	82	40.5	17.6
RAP-B511-UK	140	80	40.5	17.6
RAP-B511-US	115.9	115.9	40.5	17.6

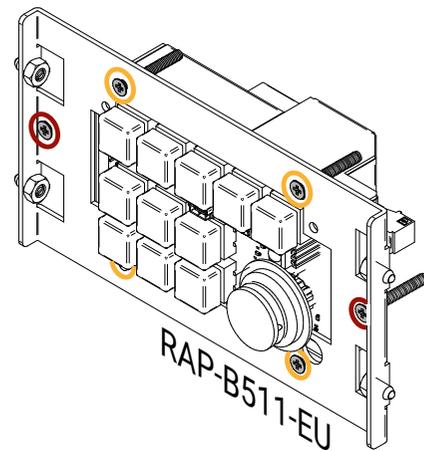


2.1.4. Mounting RAP-B511-EU into the Outlet Box

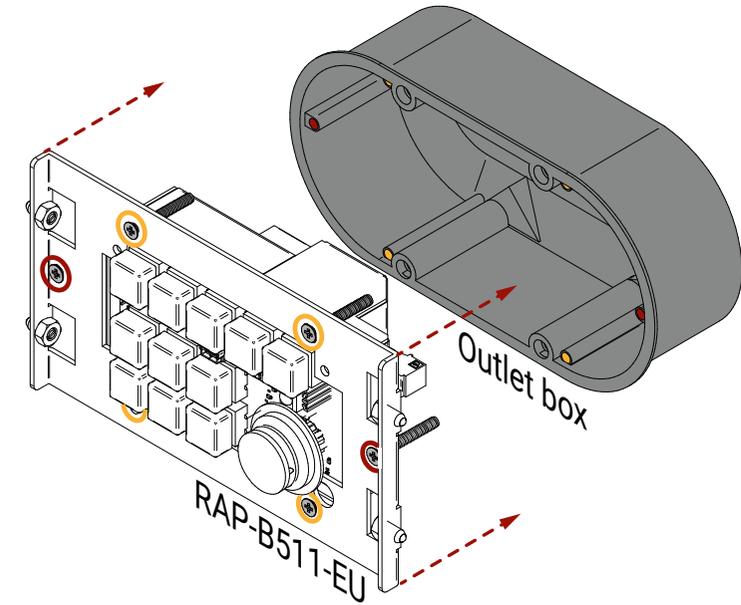
Step 1. Pull apart the **Front plate** from the **RAP-B511-EU** by hand (no special tool needed).



Step 2. Place two screws (marked with red color) **OR** four screws (marked with yellow color) in the holes.

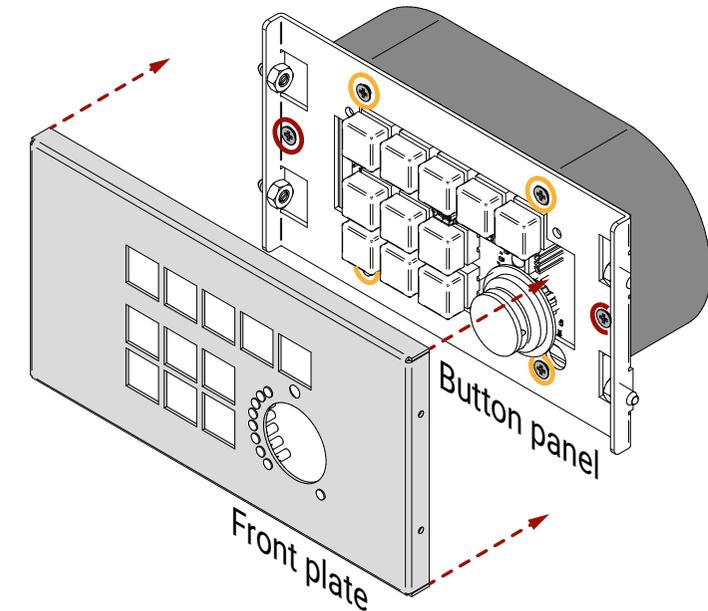


Step 3. Insert the **RAP-B511-EU** into the **Outlet box** and position it to get the holes aligned.



Step 4. Fasten the front side of the device to the **Outlet box** by fitting all the screws.

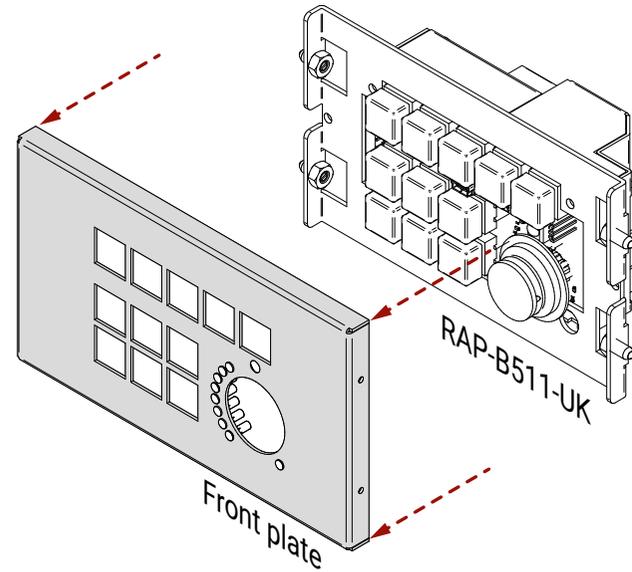
Step 5. Place back the **Front plate** to the **Button panel**.



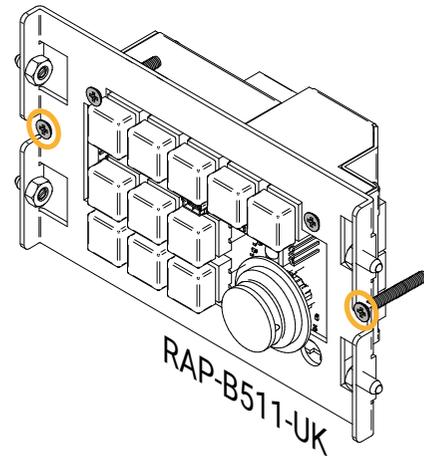
See more details about the exact sizes of the RAP-B511-EU in the [Mechanical Drawings](#) section.

2.1.5. Mounting RAP-B511-UK into the Outlet Box

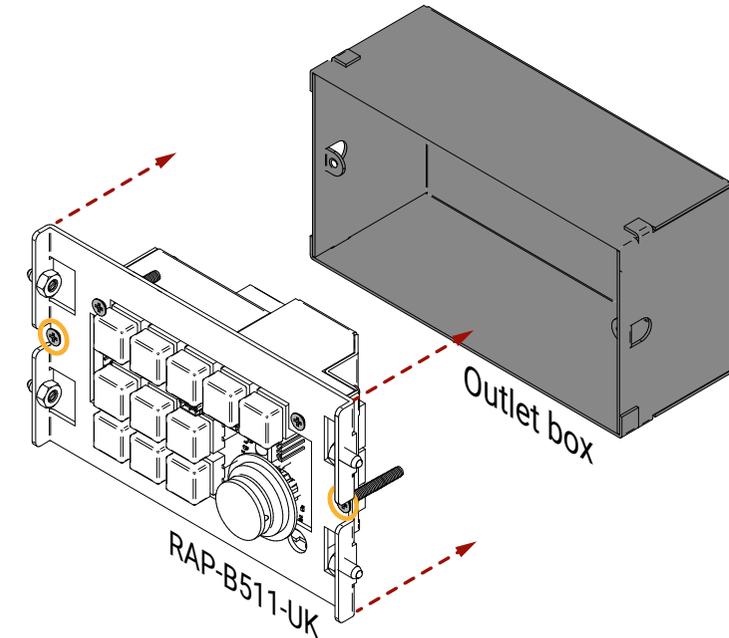
Step 1. Pull apart the **Front plate** from the **RAP-B511-UK** by hand (no special tool needed).



Step 2. Place the screws (marked with yellow) in the holes.

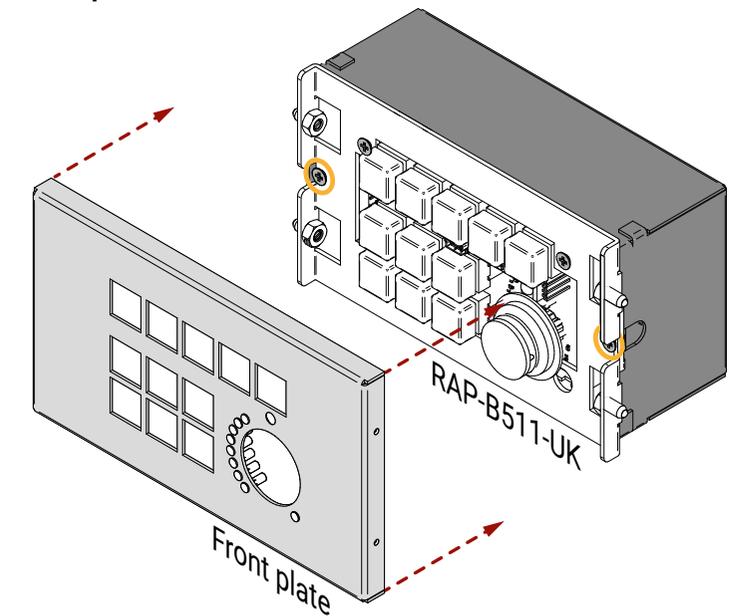


Step 3. Insert the **RAP-B511-UK** into the **Outlet box** and position it to get the holes aligned.



Step 4. Fasten the front side of the device to the **Outlet box** by fitting all the screws.

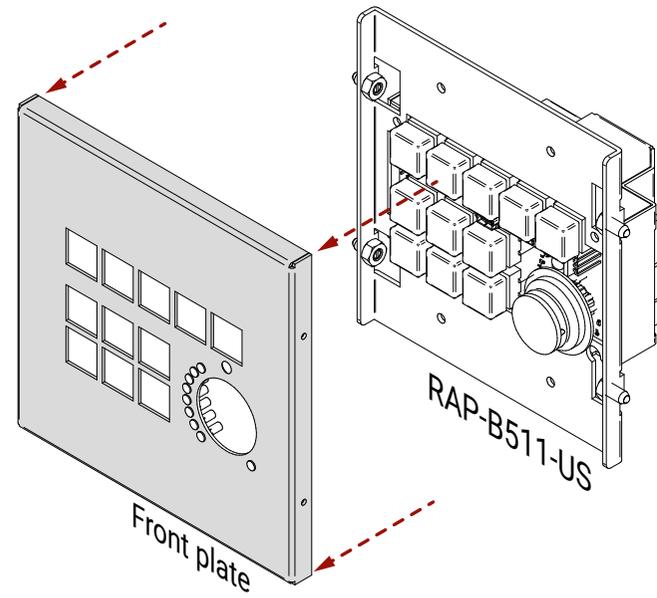
Step 5. Place back the **Front plate** to the **RAP-B511-UK**



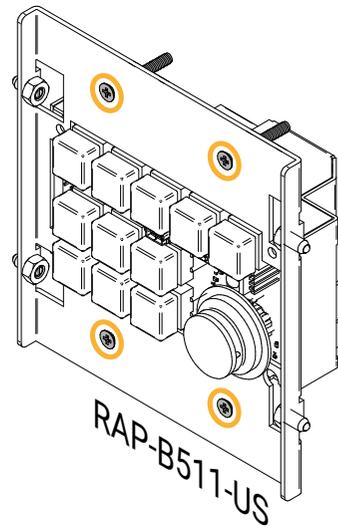
See more details about the exact sizes of the RAP-B511-UK in the [Mechanical Drawings](#) section.

2.1.6. Mounting RAP-B511-US into the Outlet Box

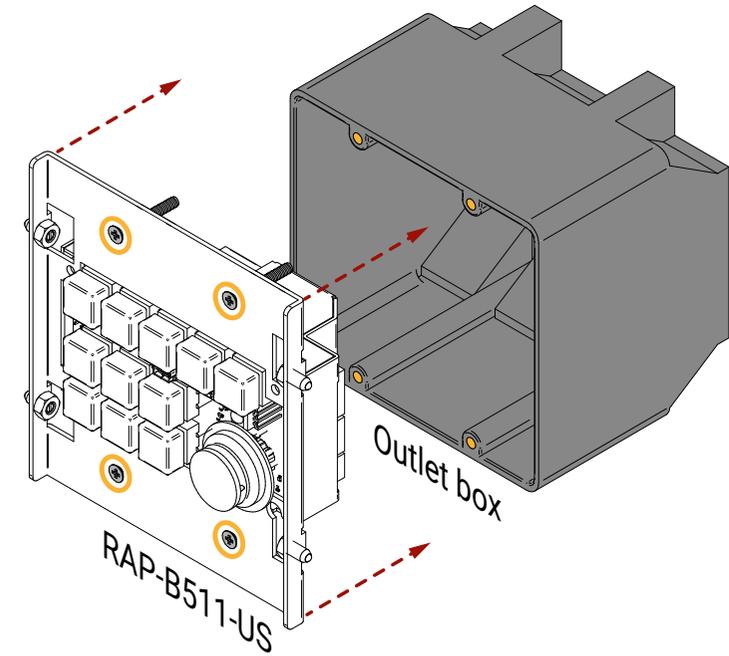
Step 1. Pull apart the **Front plate** from the **RAP-B511-US** by hand (no special tool needed).



Step 2. Place four screws (marked with yellow) in the holes.

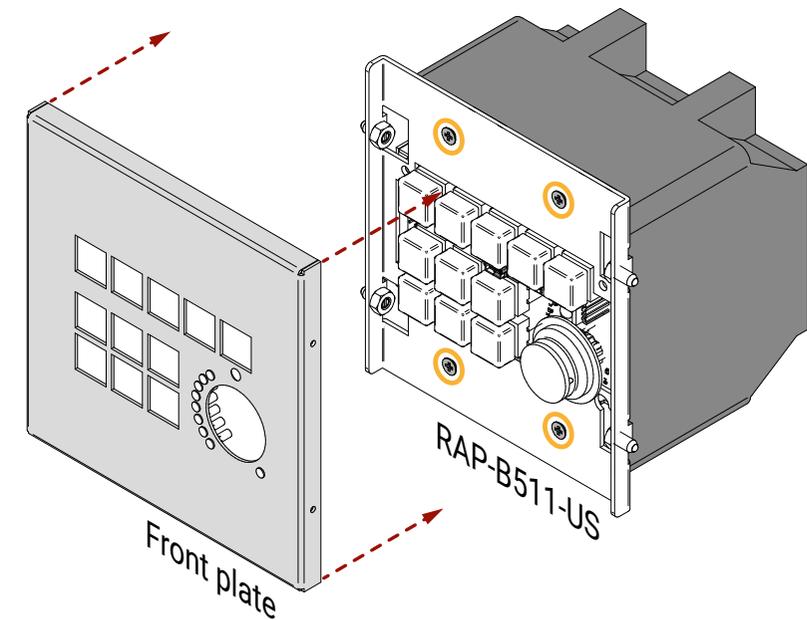


Step 3. Insert the **RAP-B511-US** into the **Outlet box** and position it to get the holes aligned.



Step 4. Fasten the front side of the device to the **Outlet box** by fitting all the screws.

Step 5. Place back the **Front plate** to the **RAP-B511-US**



See more details about the exact sizes of the RAP-B511-US in the [Mechanical Drawings](#) section.

2.2. Powering Options

RAP-B511 series automation panel is compatible with IEEE 802.3af standard - Power over Ethernet (PoE) - and one Ethernet port can receive and the other one can send power over the Ethernet line.

The room automation panel can be powered by any of the following ways:

Local adaptor and remote power (PoE OUT)

When it is locally supplied with 48V DC adaptor, the room automation panel is able to send remote power via POE OUT RJ45 connector to other PoE-compatible device.

Remote power injector (PoE IN)

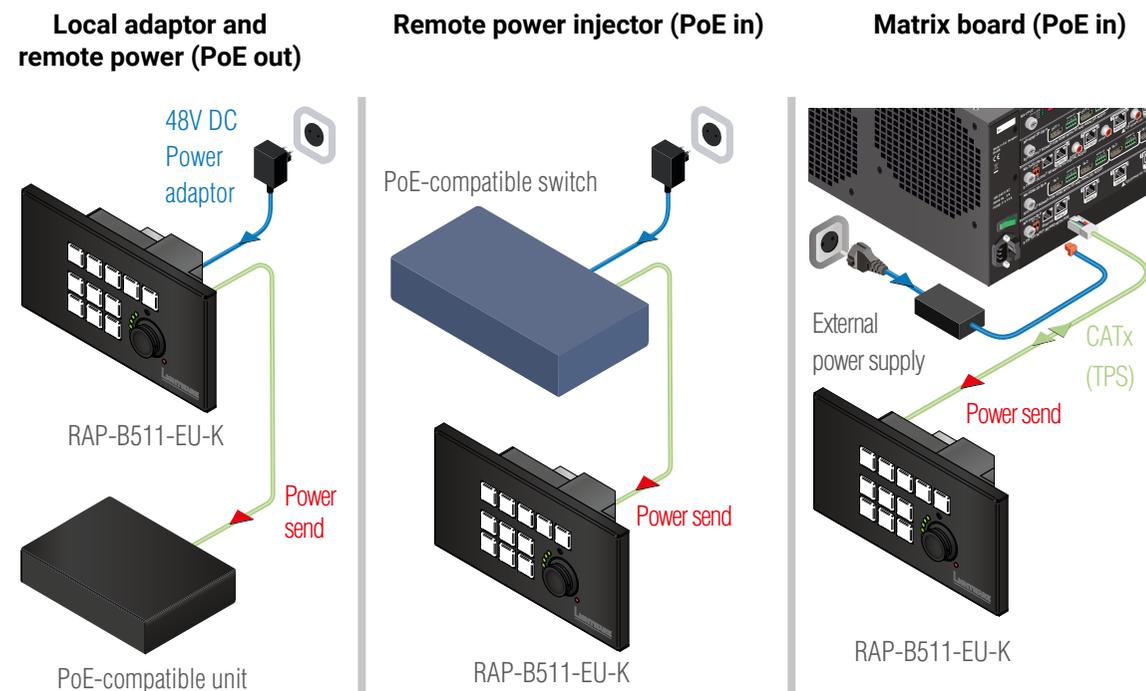
The RAP-B511 can be powered remotely by a PoE-compatible power injector, like a PoE-compatible switch. Connect it to the POE IN labeled RJ45 connector.

Standalone Matrix or Matrix board (PoE IN)

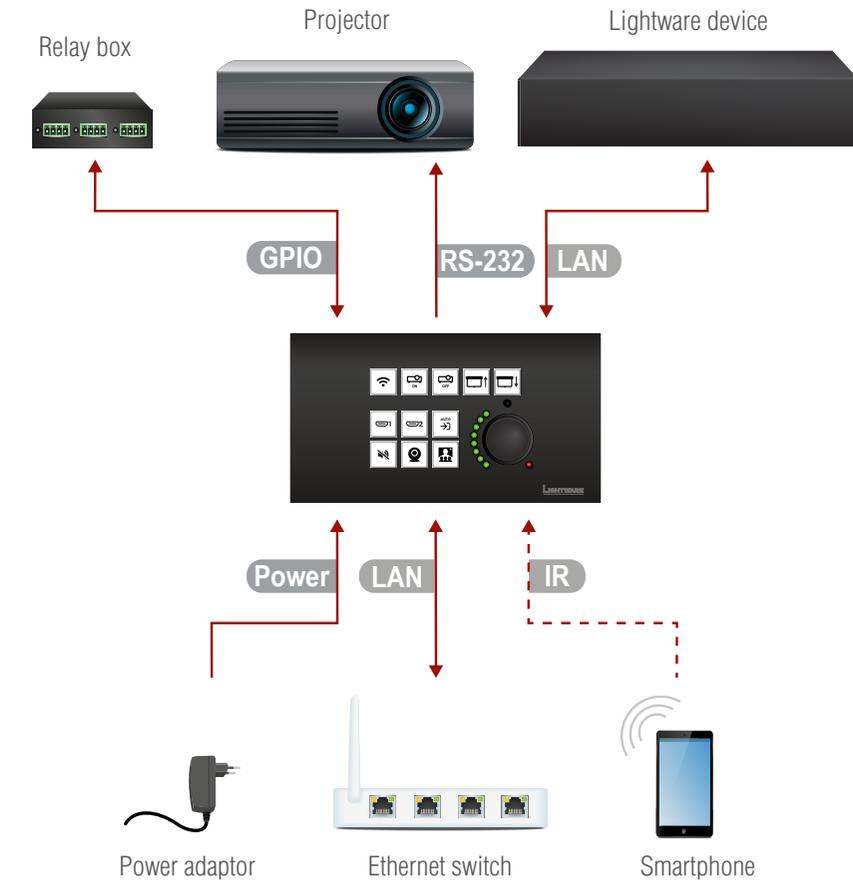
Powering by a matrix board* over the CATx (TPS) cable. The output board needs to be powered by an external PSU. Connect it to the POE IN labeled RJ45 connector.

* TPS2 I/O board with PoE extension (-P)

INFO: Over the CATx cable, the Ethernet communication is transmitted.



2.3. Connecting Steps



- GPIO** Connect a controller/controlled device (e.g. relay box) to the GPIO port.
- RS-232** For RS-232 extension: connect a controller/controlled device (e.g. Projector) to the RS-232 port.
- LAN**
 - Connect the device to a LAN network in order to control the device.
 - Connect a PoE-compatible device for remote powering and control to the PoE out LAN port.
- IR** Built-in infra detector is ready to receive any IR signal without user intervention.
- Power** Powering on the devices is recommended to do as the final step during the installation. Please check the [Powering Options](#) section for the details.

3

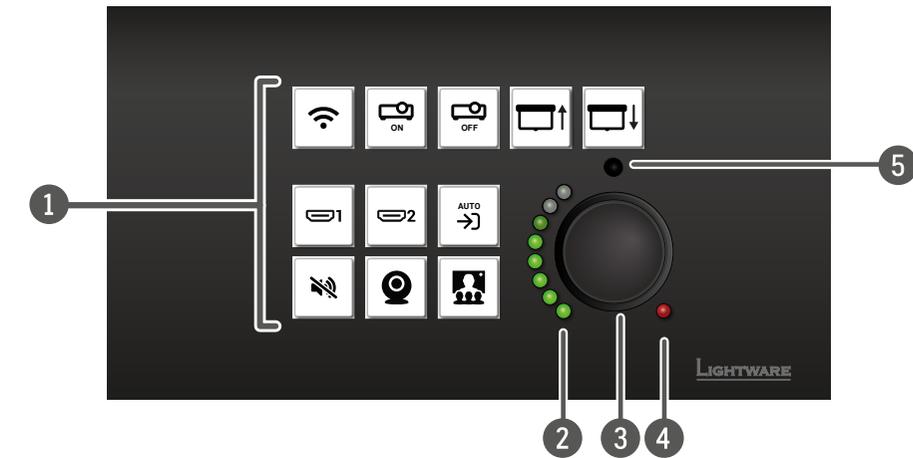
Product Overview

The following sections are about the physical structure of the device, and the connectors:

- ▶ [FRONT VIEW](#)
- ▶ [REAR VIEW](#)
- ▶ [ELECTRICAL CONNECTIONS](#)

3.1. Front View

INFO: All the models have the same look and controls on the front panel, the only difference is the size and the color of the enclosure.



INFO: The labels of the buttons are just for illustration since the button caps are empty by default. The user can insert the desired label from the attached sheet.

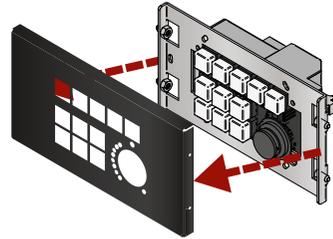
- 1 Buttons** 11 configurable buttons with short and long press detection. Each button has a programmable background light. They can be configured for immediate feedback of pushing the buttons or can be set to five different modes: off / low bright / high bright / slow blink / sine pulse. Blinking of the button and rotary LEDs three times means, that the front panel functionality is locked. Unlocking is possible with [Software Control - Lightware Device Controller](#) or via LW3 protocol commands (for more details see [LW3 Programmers' Reference](#) section).
- 2 Rotary LEDs**

 -  **full bright** As the jog dial is rotated right (and the volume increases), the LEDs turn on one-by-one. One level means half brightness. The picture on the left shows that the volume is set 11.
 -  **half bright**
 -  **off**
- 3 Rotary knob** Jog dial for volume control on a 16-level scale or it can be programmed for other controlling purposes by turning and clicking the knob.
- 4 Mute LED** It gives feedback about the mute status of the volume. It can be toggled on and off by pushing the rotary knob.

 -  **on** The volume is muted.
 -  **off** The volume is unmuted.
 -  **blinking** The device is in bootload mode. Press the rotary knob for 5 sec for changing to the normal operation mode.
- 5 IR detector** Built-in IR eye to receive infra signal.

3.1.1. Hidden Functions

After removing the front plate (no special tool needed, just pull apart by hand), a USB connector, a reset button, and a live led can be seen.

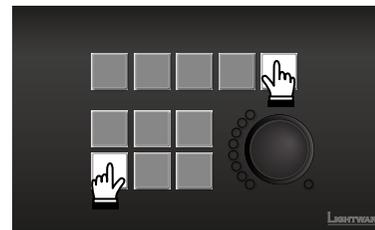


- 1 **USB Port** USB mini-B connector can be used for LDC access or firmware upgrade.
- 2 **Reset Button** Hidden button to restart the device.
- 3 **Live LED**
 - blinking The unit is powered and ready to use.
 - on The device is powered, but the CPU is not running.
 - off The unit is NOT powered or out of operation.

3.1.2. Special Functions

Reset the Device

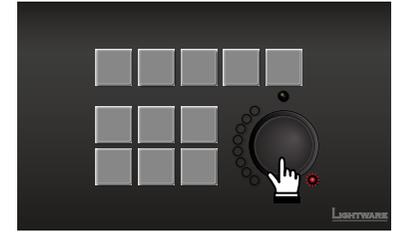
- Step 1.** Keep the 5th and the 9th button pressed for **10 seconds**.
- Step 2.** Release the buttons. The mute LED lights up when the device restarts.



Entering Bootload Mode

It may happen that the firmware upgrade process is unsuccessful and the device cannot be switched to bootload mode automatically. In this case, the device can be forced into bootload mode as follows:

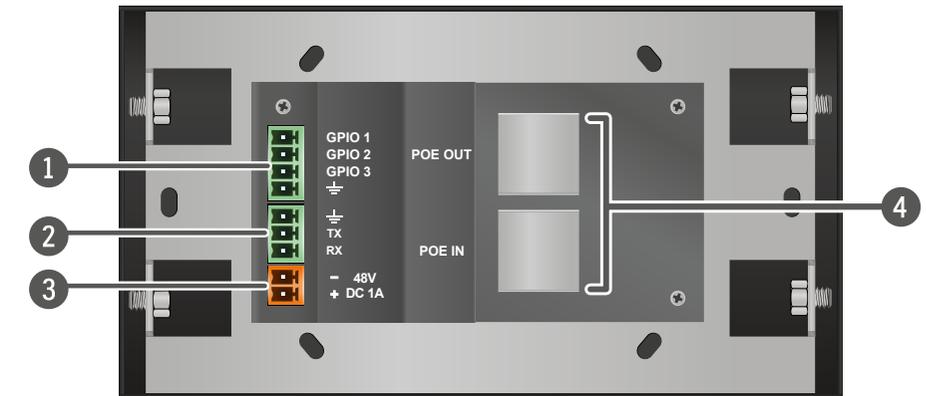
- Step 1.** Make sure the device is powered off.
- Step 2.** Press and keep pressed the Rotary knob.
- Step 3.** Power on the RAP-B511 while the Rotary knob is being pressed. If the device is switched to bootload mode the Mute LED is blinking quickly. Release the knob.



The other LEDs are off. The procedure of firmware upgrade can be found in the [Firmware Upgrade](#) chapter.

INFO: Press the rotary for 5 sec to switch the normal operation mode.

3.2. Rear View



- 1 **GPIO** 4-pole Phoenix® connector for configurable general purpose.
- 2 **RS-232 port** 3-pole Phoenix® connector for bi-directional serial communication.
- 3 **DC Input** The device can be powered by a local adaptor. Connect the output to the 2-pole Phoenix® connector. For more information about the powering, see [Powering Options](#) section.
- 4 **Ethernet ports** Two RJ45 connectors for Ethernet communication. Both of them are PoE-compatible, one is a PoE receiver, the other can send PoE (PoE sending is available when the device is locally powered).

3.4. Electrical Connections

3.4.1. 48V DC Connection

RAP-B511 series is built with 2-pole Phoenix connector for 48V DC 1A power connection.



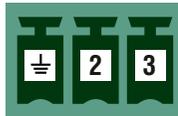
Pin nr.	Signal
1	+
2	-



2-pole Phoenix connector and plug pin assignments

3.4.2. RS-232 Connector

The device contains a 3-pole Phoenix connector which is designed for RS-232 serial connection.



Pin nr.	Signal
1	Ground
2	TX data
3	RX data



RS-232 connector pin assignments

RS-232 Output Voltage Levels

- Logic low level: 3V .. 15V
- Logic high level: -15V .. -3V

Compatible Plug Type

Phoenix® Combicon series (3.5mm pitch, 3-pole), type: MC 1.5/3-ST-3.5.

You can find more information about RS-232 in [Settings for Other Interfaces](#) section.

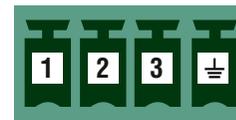
INFO: The RAP-B511 series operates as a DCE unit according to its pin-out.

3.4.3. GPIO - General Purpose Input/Output Ports

RAP-B511 series contains a 4-pole Phoenix connector with three GPIO pins, which operates at TTL digital signal levels and can be set to high or low level (Push-Pull). The direction of the pins can be input or output (adjustable). Voltage ranges for GPIO inputs are the following:

	Input voltage [V]	Output voltage [V]	Max. output current [mA]
Logical low level	0 - 0.8	0 - 0.5V	30
Logical high level	2 - 5	4.5 - 5V	18

INFO: The maximum total current for the three GPIO pins is 180 mA.



Pin nr.	Level and direction
1	Configurable
2	
3	
Ground	



GPIO connector and plug pin assignments

Compatible plug type

Phoenix® Combicon series (3.5mm pitch 4-pole), type: MC 1.5/8-ST-3.5.

3.4.4. USB Connector

Behind the front panel there is a standard USB mini-B receptacle.

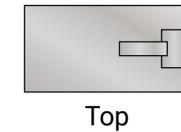
3.4.5. Control Ethernet Port

The room automation panel is supplied an RJ-45 connector for Ethernet/LAN connection for local control functions.

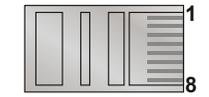


Wiring of LAN Cables

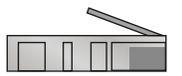
Lightware recommends the termination of LAN cables on the basis of TIA/EIA T 568 A or TIA/EIA T 568 B standards.



Top



Bottom



Side

Pin	TIA/EIA T568 A	Color and name	TIA/EIA T568 B	Color and name
1		white/green stripe		white/orange stripe
2		green solid		orange solid
3		white/orange stripe		white/green stripe
4		blue solid		blue solid
5		white/blue stripe		white/blue stripe
6		orange solid		green solid
7		white/brown stripe		white/brown stripe
8		brown solid		brown solid

4

Device Concept

This chapter is guide for building a room automation system using the whole functionality of the RAP-B511 series.

- ▶ [GENERAL CONCEPT](#)
- ▶ [INPUTS 1. - USER INTERACTIONS](#)
- ▶ [INPUTS 2. - AUTOMATION OPTIONS](#)
- ▶ [OUTPUTS - ACTIONS](#)
- ▶ [SETTINGS FOR OTHER INTERFACES](#)

4.1. General Concept

Room automation panel is designed for advanced control functions. Industrial standard communication interfaces (RS-232, Ethernet, GPIO, IR) ensure the compatibility with third-party units or Lightware products. They make automating the whole AV system in a huddle room possible.

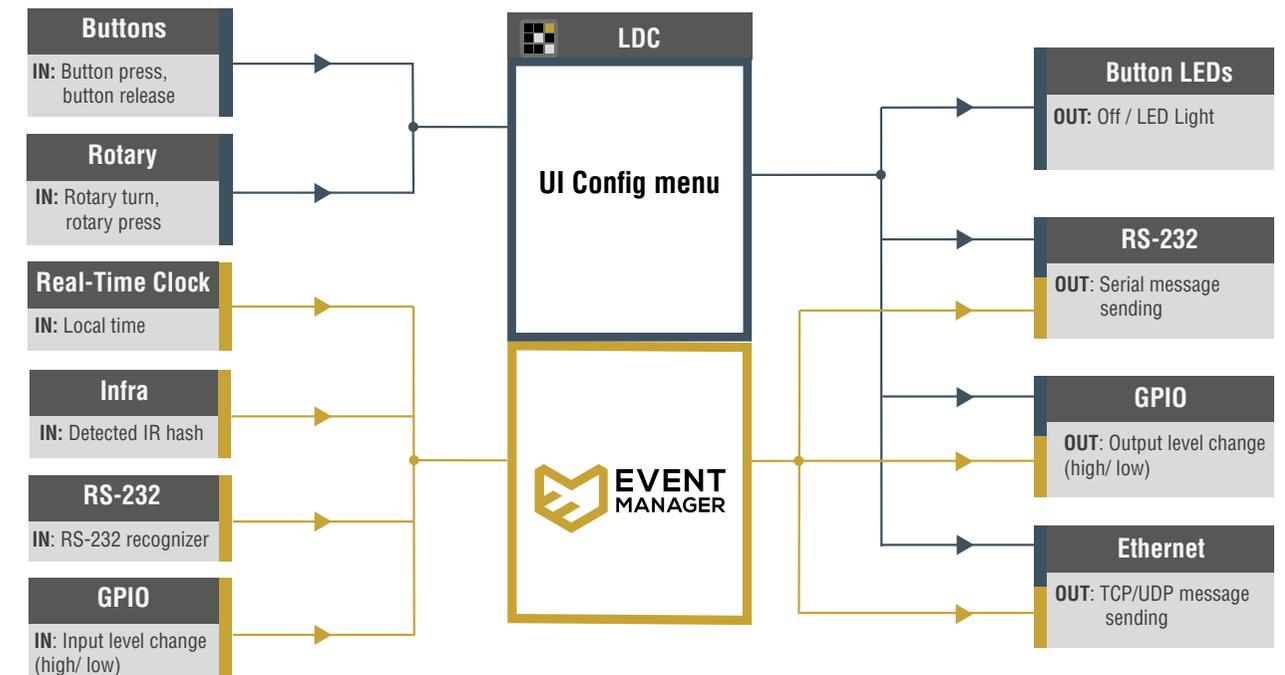
Customizing the control functions can be done by making connections between the proper inputs (triggers or conditions) and the desired outputs (actions). These settings can be done from a computer using the [Software Control - Lightware Device Controller](#) (LDC) software or via LW3 protocol commands (for more details see [LW3 Programmers' Reference](#) section).

Inputs may come from:

- The Room Automation Panel by pushing (or releasing) the button, turning or pushing the rotary switch.
- Real-Time Clock (e.g. when the local time is equal 12:00 the action is executed).
- Other incoming signals: detected IR codes, recognized RS-232 messages, GPIO level changes.

Outputs can be the followings:

- Button LEDs of the Room Automation Panel.
- Send messages (or signals) to the other device: RS-232 message sending, TPC/UDP message sending, GPIO output state changing.



These settings are available both the Event manager and the UI Config menu, but managing the configuration is highly recommended in the UI config menu.

These settings are available only in the Event manager.

4.2. Inputs 1. - User Interactions

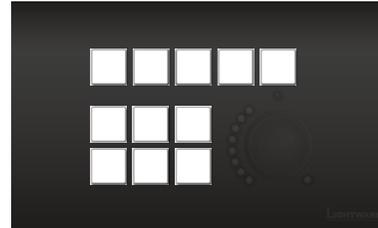
The operation of the RAP-B511 series is based on user interactions such as button press, or turn the rotary. These are the main triggers (or inputs) of the control functions. They can be quickly and easily customize in [UI Config Menu](#) of the [Software Control - Lightware Device Controller \(LDC\)](#) software.

4.2.1. Buttons

The RAP-B511 has 11 configurable buttons, and two main button states are defined: **Pressed** and **Released**.

Operation mode is an attribution of the button, which declares the button behavior when it is pressed or released. Three different operation modes are available: **momentary**, **toggle** and **radio group (1-5)**.

The chosen **operation mode** defines how the **interaction state** changes when the button is pressed or released (see the details about it in the table on the right). The true or false value of the **interaction state** triggers the button LED function and the desired action.



Momentary operation mode

Simple button function, when the button is pressed, the action will be executed.

Example: Roll down the shades with keeping the button pressed. When the button is released, the shades stop.

Explanation: When the button is pressed, the interaction state changes true, when the button is released, the interaction state changes false.

Toggle operation mode

This button type toggles between two states.

Example: Turn on and off the light with one button.

Explanation: When the button is pressed, the interaction state changes true, when the button is released, the interaction state does not change. When the button is pressed once again, the interaction state changes false.

Radio group operation mode

It defines the assigned radio group of the button. One button can belong to one group at the same time. Five groups are available, one group may contain max. 11 buttons.

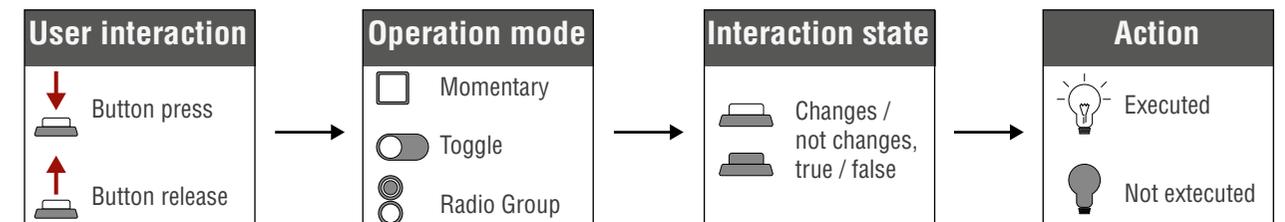
Example: Select video input on a crosspoint or switcher. One input can be active at the same time.

Explanation: When the button is pressed, the interaction state changes true and the interaction state of the other group members are false. When the button is released, the interaction state does not change.

Summary of the button operation modes

Momentary Operation Mode				
	PRESS	RELEASE	PRESS	RELEASE
				
				
interaction state	true	false	true	false
Toggle Operation Mode				
	PRESS	RELEASE	PRESS	RELEASE
				
				
interaction state	true	true	false	false
Radio Group Operation Mode				
	PRESS	RELEASE	PRESS	RELEASE
				
	 1	 2	 3	 1
	 2	 3	 1	 2
	 3	 1	 2	 3
interaction state	true false false	true false false	false true false	false true false

Flowchart of the button configuration process



INFO: All settings of the button functions are available in the Lightware Device Controller software (see the details in [Buttons](#) section) or via LW3 protocol commands (for more details see [Button Configuration](#) section).

4.2.2. Rotary

The jog dial knob is designed for volume control (in a 16-level scale), but it can be used for other controlling purposes, too.

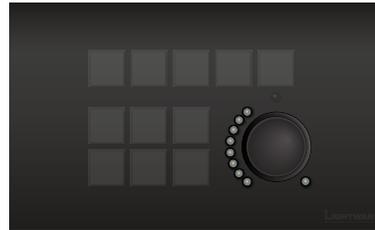
Turning left and right the rotary changes the volume value from 0 to 16. The volume values are the conditions, which are assigned to the control commands (e.g. SET /MEDIA/PORTS/VIDEO/O2/ANALOGAUDIO.VolumedB=-96\x0d\x0a). When the rotary reaches the proper position, the action will be executed.

The control command can be sent over RS-232 or Ethernet (in this case, the IP address of the target device is needed).

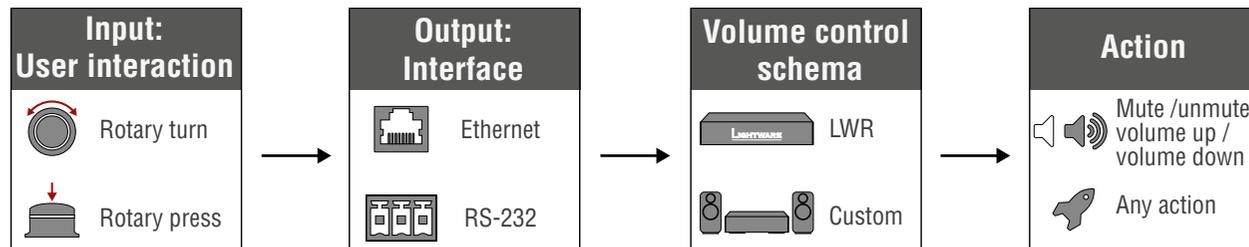
LWR Volume Control Schema supports to load the LW3 command list automatically for controlling the volume (and the mute/unmute state) of the Lightware devices. Choose the proper schema (see more details about the compatibility table in [Configurations of the Rotary](#) section) and fill the audio port number.

Custom Volume Control Schema makes it possible to configure any command for controlling a third-party device.

Knob press toggles between the muted and the unmuted states. When the **Custom** schema is loaded, press and release event can be configure for any purpose.



Flowchart of the rotary configuration process



INFO: Customizing the rotary functions is possible with Lightware Device Controller software (the details can be found in [Configurations of the Rotary](#) section) or with LW3 protocol commands (for more details see [Volume Control Configuration](#) section).

4.3. Inputs 2. - Automation Options

The below-listed features give an opportunity to "automate" the control system, and the Room Automation Panel reacts to the inputs automatically, user intervention is not necessary.

These inputs can be set as a condition in the [Event Manager](#) in the [Software Control - Lightware Device Controller](#) (LDC) software. They trigger the desired actions.

4.3.1. Real-Time Clock

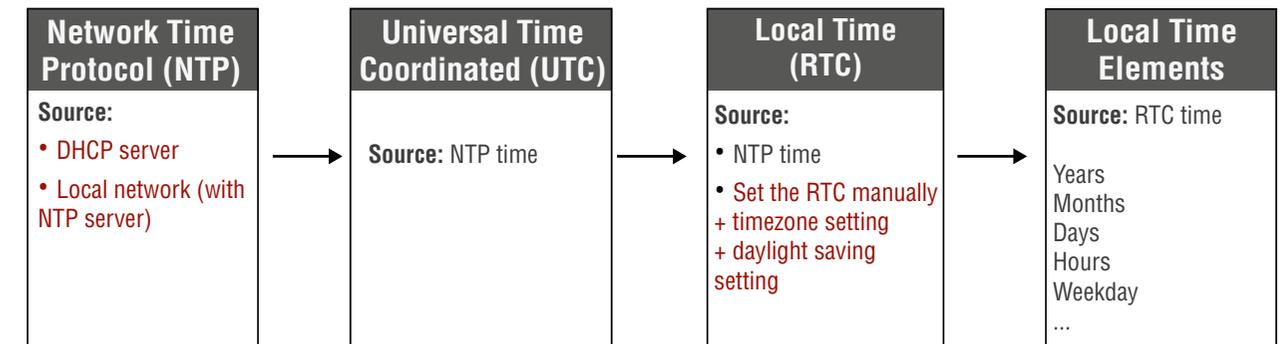
The real-time clock feature supports the storage of the exact time in the device. The time can be programmed as a condition in the event manager: single and weekly repetitive events may be configured with this function. Local time elements (years, months, days, etc.) help customize the proper timing of the actions.

A BR1632A battery is supplied with the product, it ensures the fluent operation of the built-in timer while the device is not powered.

ATTENTION! The battery is designed for life-long usage in a fixed installation, so it cannot be replaced!

Real-Time Clock Settings

The flowchart below displays the correlation of the time properties. The red colored settings can be defined by the user, the others generated automatically.



Flowchart of the real-time clock configuration process

INFO: All settings of the Real-time clock is possible using the Lightware Device Controller software (see the details in [Time Settings](#) section) or via LW3 protocol commands (in [Time Settings](#) section).

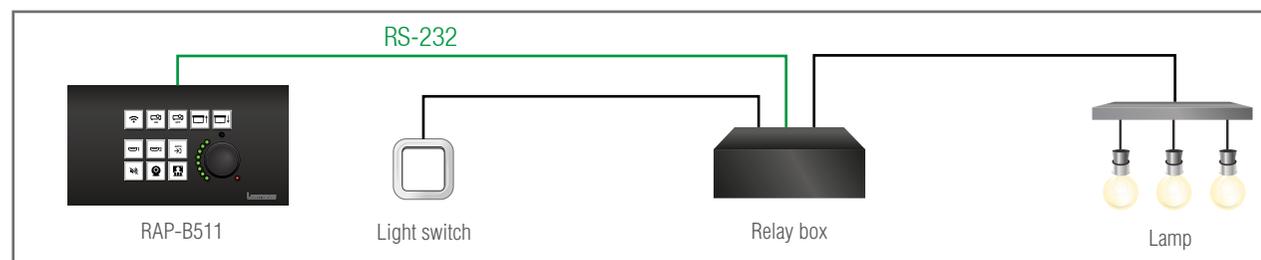
4.3.2. RS-232 Recognizer

This tool is able to recognize and store the incoming RS-232 message until the previously defined string (delimiter) has arrived or the timeout has elapsed after the last data. The last incoming serial data is stored and it can trigger an action in Event Manager.

ATTENTION! The recognizer function works, when the operation mode of the RS-232 port is control or command injection (in this case, one of the Ethernet socket have to be opened). For more details about the operation modes see [Serial Interface](#) section.

RS-232 Recognizer Example

The lamp can be turned on and off both with the light switch and the RAP-B511. When the lamp turned off by the switch, the relay box sends an RS-232 status message to the RAP-B511 to inform, and that the lamp was turned off. When the lamp is controlled with RAP-B511 next time, the device sends the 'turn on' command to the relay box of the lamp. This example shows how to synchronize the same control function in the RAP with an other device.

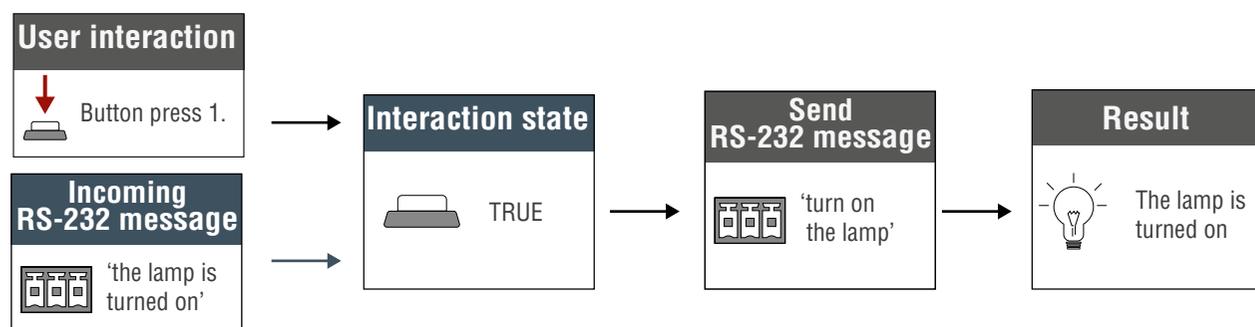


At first, configure the recognizer for the serial communication, after that, configure the Button1.

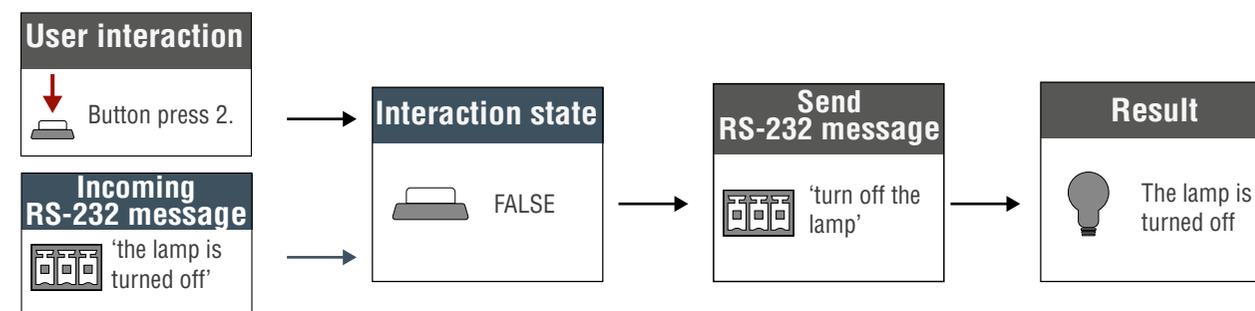
Step 1. Enable the operation of the recognizer, set an optimal timeout (e.g. 30 ms). Set the RS-232 operation mode to Control.

The flowcharts below show the process of the system. The blue highlight boxes display the settings which connected to the RS-232 recognizer.

Turn on the lamp



Turn off the lamp



Do the following setting on the UI Config page:

- Step 2.** Select the **Button1** and set the operation mode to **Toggle**. The first button press changes the interaction state to true. It happens automatically.
- Step 3.** Choose the **TRUE feedbacks** tab and click on the **RS-232 message recognized** condition. Write the serial message which is sent by the relay box about the lamp status in the entry field of the pop-up window (e.g. 'the lamp is turned on'). Click **Ok** to save.
- Step 4.** Choose the **FALSE feedbacks** tab and click on the **RS-232 message recognized** condition. Write the serial message which is sent by the relay box about the lamp status in the entry field of the pop-up window (e.g. 'the lamp is turned off'). Click **Ok** to save.

The RS-232 recognizer settings has to be done with Lightware Device Controller Software (see details in see [Message recognizer](#) section) or with LW3 protocol commands (see more information in [RS-232 Recognizer](#) section).

For more information about the button configuration, see [UI Config Menu](#) section.

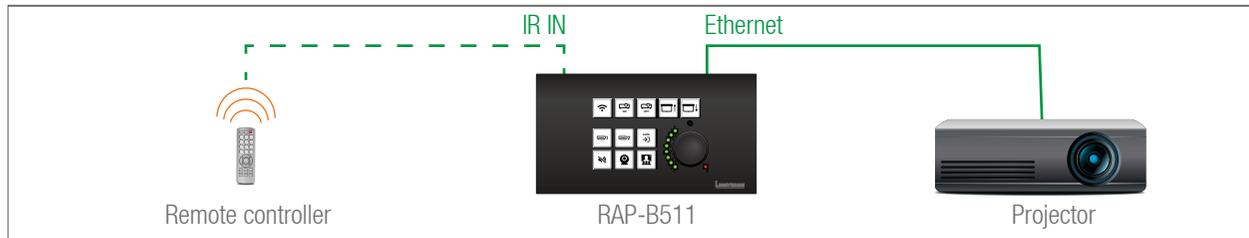
4.3.3. IR Recognizer

The RAP-B511 has a built-in IR eye with IR recognizer function. The incoming signal is stored in hash (fingerprint), and it can trigger actions in Event Manager.

INFO: All settings are available in the LDC software, more details can be found in the [Infra](#) section.

IR Recognizer Example

IR signals are sent by the Remote controller, the projector is connected to the Ethernet port of the RAP-B511.



The projector can be powered on via the RAP-B511 by using the remote controller with the following way:

- Set an action in Event Manager: if the power button is pressed on the Remote controller, the RAP-B511 sends a control command ('Power on') to the projector via Ethernet. In this case you can control the device via the RAP-B511 remotely. See the details about the Event Manager settings in the [Event Manager](#) section.

4.3.4. GPIO Input Level Change

The GPIO (General Purpose Input/Output) port is a multifunctional input/output interface to control the RAP-B511 or third-party devices and peripherals. You can establish connection between the controller/controllable device and the RAP-B511 by the 4-pole Phoenix connector. Three pin's direction is configurable independently based on needs of the application.

When the GPIO pin is used as an input, it is able to receive feedbacks from the other device by changing the input level. The configuration is available in [UI Config Menu](#) and the [Event Manager](#).

4.4. Outputs - Actions

Outputs of the Room Automation Panel can be a feedback about the executed event (e.g. after the button press the button LED lights) or a control signal to the other device. Outputs can be set in the [UI Config Menu](#) (and in the [Event Manager](#)) in the [Software Control - Lightware Device Controller](#) (LDC) software.

4.4.1. Button LED Configuration

Button LEDs are customizable feedback of the user interaction or any input which is set as a condition. The LED behavior takes into consideration of the status of the **interaction states**. For more details about it, see [Buttons](#) section. The button LEDs can be configured separately.

LED states

Six different LED behaviors are available:

Off / Low brightness / High brightness / Blinking / Slow blinking /Sine pulse

Default LED intensity

Low brightness and High brightness intensity can be customized in 0-5 level scale where 0 means no light, 5 means maximum intensity.

The factory default value of the low brightness: 2

The factory default value of the high brightness: 5

This setting is available in the LDC in the [Front Panel Settings](#) section or with LW3 protocol commands (for more details see [Configure Button](#) section).

Default LED function

The button LED can get a **default** function where two cases are defined:

- LED function for true state (when the **interaction state** is **true**)

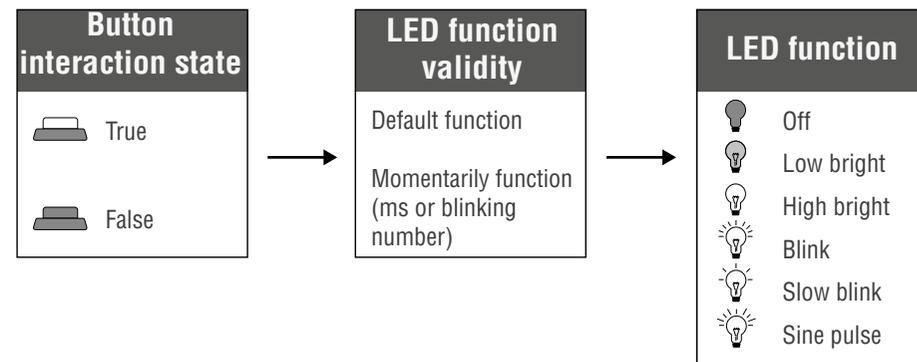
Example: Button1 is in Momentary operation mode, so when it is pressed, the interaction state changes true. If the LED function for true state is on, the button LED will turn on while it is pressed.

- LED function for false state (when the **interaction state** is **false**)

Example: Button2 Button3, Button4 are in the same radio group. When Button2 is pressed, its interaction state changes true and the other's interaction states change false. If the LED function for false state is off (by all buttons in the group), the LEDs of Button3 and Button4 will turn off.

Momentarily LED function

The Button LED can get a **momentarily** function. This overwrites the **default** function for a while. Duration time has to be set if the LEDs **momentarily** function is off / low bright /high bright. Blinking number is required when the LEDs **momentarily** function is blinking.



LED function settings has to be done with [Software Control - Lightware Device Controller](#) software (in [UI Config Menu](#) section) or with LW3 protocol commands (for more details see [Button LED Configuration](#) section).

4.4.2. Rotary LEDs

Rotary LEDs always display the actual position of the rotary. For more details about it see [Front View](#) section.

4.4.3. Serial Message Sending

The RAP-B511 can send serial messages via RS-232 port in order to control the other devices. This function can be set as an action which executed after the trigger condition (e.g. buttonpress).

Preparations and Settings

- The RS-232 port settings (baud rate, data bits, parity, stop bits) of the connected serial devices must be the same.
- The RS-232 port of the RAP-B511 must be in **Disconnect** mode. (If the target device is also Lightware unit, take care of the its operation mode, too)
- Pay attention to the correct serial cabling (connector pinout). For more details about the cabling, see [Wiring Guide for RS-232 Data Transmission](#) section.

The configuration is available in [UI Config Menu](#) and the [Event Manager](#). The details about serial message sending is available in the [Sending Message via the Communication Ports](#) section or in the [Message Sending Application Note](#).

4.4.4. Ethernet Message Sending

The RAP-B511 can send TCP or UDP messages via Ethernet port in order to control the other devices. This function can be set as an action which executed after the trigger condition (e.g. buttonpress).

Preparations and Settings

- Pay attention to the TCP/IP port no. (and have it opened) settings in the connected devices. (The Ethernet has to be enabled at the TPS and Ethernet ports.)
- The Ethernet devices must be in the same subnet.
- If you have problems with accessing a device over Ethernet, try to check the connection e.g. by pinging the IP address.

All settings are available in [UI Config Menu](#) and the [Event Manager](#). The details about Ethernet message sending is available in the [Sending Message via the Communication Ports](#) section or in the [Message Sending Application Note](#).

4.4.5. GPIO Output Level Change

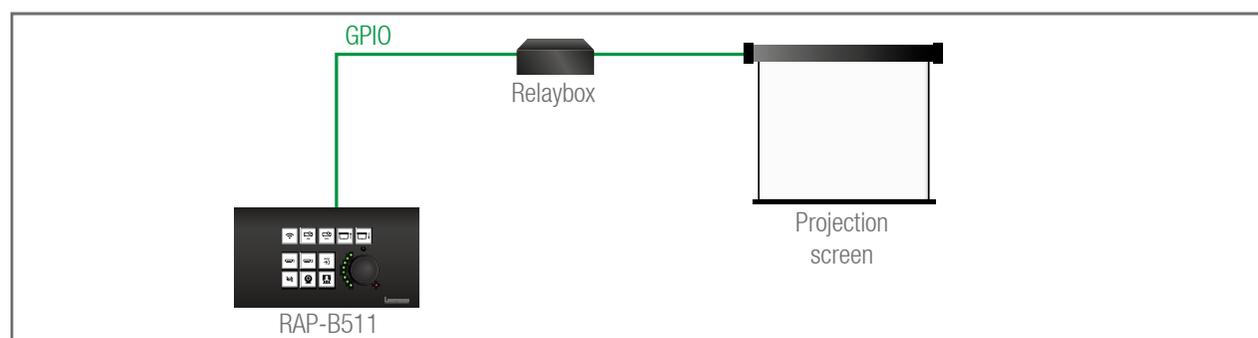
The GPIO (General Purpose Input/Output) port is a multifunctional input/output interface to control the RAP-B511 or third-party devices and peripherals. You can establish connection between the controller/controllable device and the RAP-B511 by the 4-pole Phoenix connector. Three pin's direction is configurable independently based on needs of the application.

When the GPIO pin is used as an output, it is able to send a TTL signal the other device by changing the output level. GPIO output level change can be set as an action.

The configuration is available in [UI Config Menu](#) and the [Event Manager](#).

GPIO Example

The projection screen is moved up and down by **Relay box** when the Button2 or the Button3 is pushed. Relay box is controlled by the GPIO port.



Step 1. Select the **Button2** and **Button3** set their operation mode to **Radio Group1**.

Step 2. When the **Button2** is pressed, it triggers the P1 pin of the GPIO to high level (it closes the Relay and the projection screen is rolled down). Select the **Button2** and choose the **Turn ON actions** tab. Click on the **Set output state to 'High'** action and set the **P1** output port. Click **OK** to save.

Step 3. When the **Button3** is pressed, it triggers the P1 pin of the GPIO to low level (it opens the Relay and the projection screen is rolled up). Select the **Button3** and choose the **Turn ON actions** tab. Click on the **Set output state to 'Low'** action and set the **P1** output port. Click **OK** to save.

ATTENTION! Please always check the electrical parameters of the devices what you want to control. The maximum current of one GPIO pin is 30 mA, the maximum total current for the three pins is 180 mA.

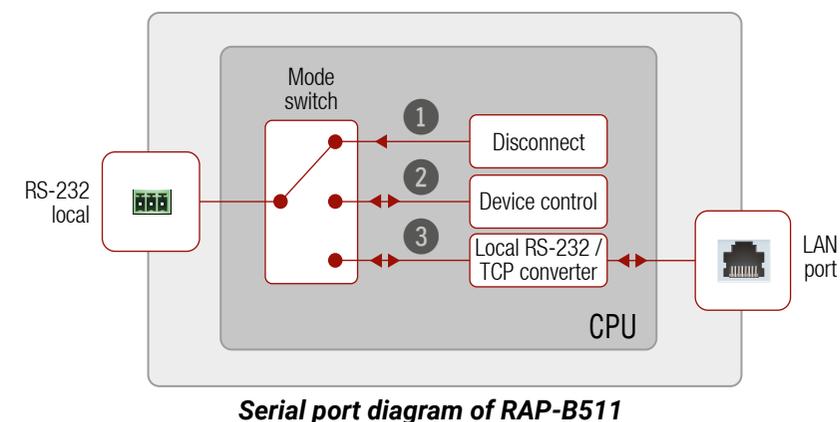
See the LDC settings for GPIO port in the [GPIO](#) section. See also the details about the button configuration, in the [UI Config Menu](#) section.

4.5. Settings for Other Interfaces

4.5.1. Serial Interface

Technical Background

Serial data communication can be established via the local RS-232 port (Phoenix connector). Three different RS-232 modes can be set for the serial port: Disconnect, Control mode, or Command Injection; see the figure below.



The following settings are defined:

- ① The serial port is in **Disconnect mode**.
- ② The serial port is in **Control mode**.
- ③ The serial port is in **Command Injection mode**.

INFO: All settings are available in the LDC software, see details in the [RS-232](#) section.

Only one mode can be used at a time: **Disconnect**, **Control mode**, or **Command Injection mode**.

Disconnect Mode

This mode is for sending control commands to a third-party (or a Lightware) device from the RAP-B511. ASCII characters and binary data in hexadecimal format can be used in this case.

Control Mode

The incoming data from the given port is processed and interpreted by the CPU. The mode allows to control the device directly. LW2 or LW3 protocol commands are accepted – depending on the current port setting.

INFO: Serial message sending is available in control mode.

Command Injection Mode

In this mode, the device works as a TCP/IP <-> RS-232 bidirectional converter. The TCP/IP data is converted to RS-232 data and vice versa. For this operation separated TCP/IP port number is defined (independent of the basic ones which are used for device control over TCP/IP).

4.5.2. Ethernet Interface

The device can be controlled via Ethernet (standard RJ45 connector). This interface supports:

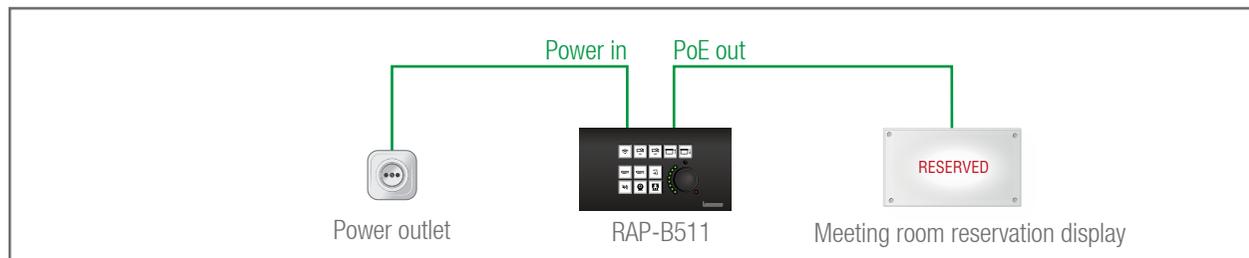
- Configure the device with Lightware Device Controller. For more information about the LDC, see [Software Control - Lightware Device Controller](#) section.
- Control Lightware devices with LW2 and LW3 command protocols. See more details about the Lightware protocols in [LW2 Programmer's Reference](#) and [LW3 Programmers' Reference](#) sections.
- Establish the connection to Lightware Device Updater v2 software and perform [Firmware Upgrade](#).
- Create local network, passthrough the Ethernet data traffic.

About PoE

The Ethernet ports of the RAP-B511 are in accordance with IEEE 802.3af (PoE) standard. One Ethernet port can receive and the other one can send power over the Ethernet line. For more information about the PoE function, see [Powering Options](#) section.

INFO: PoE-compatible and not compatible devices can be connected simultaneously as the feature can be set individually on each port.

Example



The Room Automation Panel sends PoE via Ethernet to the PoE-compatible display outside the meeting room, which shows the availability of the room.

4.5.3. USB Control Interface

The device can be controlled over front panel USB mini B-type connector. The interface can be used to establish a connection to Lightware Device Controller. For more information about the LDC, see [Software Control - Lightware Device Controller](#) section.

This interface only supports LW3 protocol. See more details about the Lightware protocols in [LW3 Programmers' Reference](#) sections.

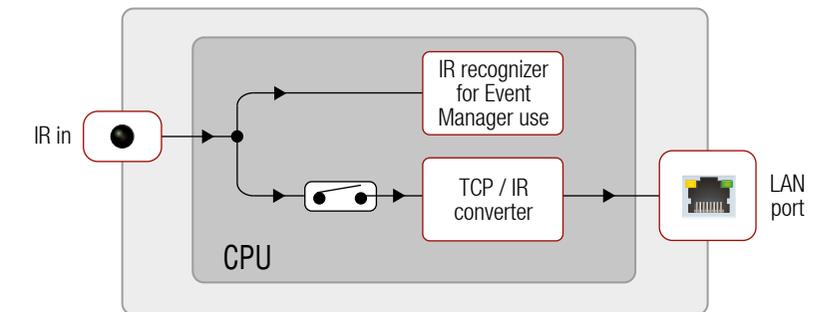
Establish the connection via USB to Lightware Device Updater v2 software and perform [Firmware Upgrade](#).

4.5.4. Infra Interface

Technical background

RAP-B511 contains dedicated IR in connection and is able to receive IR signal via the built-in IR detector units. The signal is stored in hash (fingerprint) format.

With the help of the device's IR recognizer functionality you can assign actions in Event manager (for more details, see [IR Recognizer](#) section). The second option is the command injection mode (like at [Serial Interface](#) in the previous section) where you can send IR commands over LAN. Command injection mode can be turned on and off on the input port.



Port diagram of the IR interface

INFO: All settings are available in the LDC software, see settings in the [Infra](#) section.

5

Software Control - Lightware Device Controller

The device can be controlled by a computer through the Ethernet and RS-232 port using Lightware Device Controller (LDC). The software can be installed on a Windows PC or macOS. The application and the User's manual can be downloaded from www.lightware.com.

- ▶ [INSTALL AND UPGRADE](#)
- ▶ [RUNNING THE LDC](#)
- ▶ [ESTABLISHING THE CONNECTION](#)
- ▶ [UI CONFIG MENU](#)
- ▶ [CONTROL MENU](#)
- ▶ [EVENT MANAGER](#)
- ▶ [SETTINGS MENU](#)
- ▶ [CONFIGURATION CLONING \(BACKUP TAB\)](#)
- ▶ [TIME SETTINGS](#)
- ▶ [FRONT PANEL SETTINGS](#)
- ▶ [ADVANCED VIEW WINDOW](#)

5.1. Install and Upgrade

INFO: After the installation, the Windows and the Mac application has the same look and functionality. This type of the installer is equal with the Normal install in case of Windows and results in an updateable version with the same attributes.

Installation for Windows OS

Run the installer. If the User Account Control drops a pop-up message click **Yes**.

During the installation you will be prompted to select the type of the installation: **normal** and the **snapshot** install:

Normal install	Snapshot install
Available for Windows and macOS	Available for Windows
The installer can update only this instance	Cannot be updated
Only one updateable instance can exist for all users	More than one different version can be installed for all users

Comparison of installation types

ATTENTION! Using the Normal install as the default choice is highly recommended.

Installation for macOS

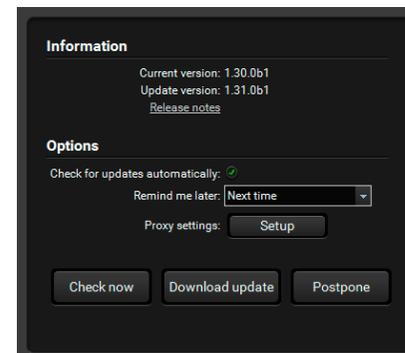
Mount the DMG file with double clicking on it and drag the LDC icon over the Applications icon to copy the program into the Applications folder. If you want to copy the LDC into another location just drag the icon over the desired folder.

Upgrading of LDC

Step 1. Run the application.

The **Device Discovery** window appears automatically and the program checks the available updates on Lightware's website and opens the update window if LDC updates are found.

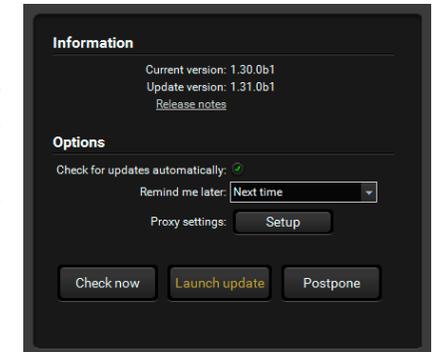
The current and the update version number can be seen at the top of the window and they are shown in this window even with the snapshot install.



The **Update** window can also be opened by clicking the **About icon** (?) and the **Update** button.

Step 2. Set the desired update setting in the **Options** section.

- If you do not want to check for the updates automatically, uncheck the **circle**, which contains the green tick.
- If you want to postpone the update, a reminder can be set with different delays from the **drop down list**.
- If the proxy settings traverse the update process, set the proper values then click the **OK** button.



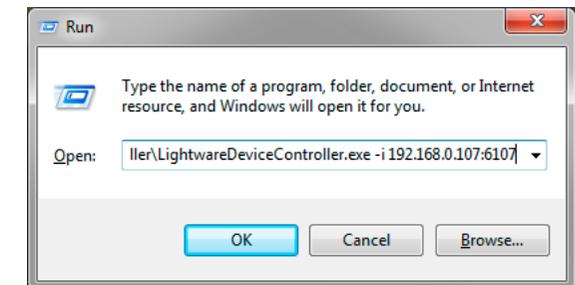
Step 3. Click the **Download update** button to start the upgrading.

Step 4. When the download process finished, the **Download Update** button changes to **Launch update**. Click it on to install the new version.

The updates can be checked manually by clicking the **Check now** button.

5.2. Running the LDC

The common way to start the software is double-click on the LDC icon. But the LDC can be run by command line parameters as follows:



Connecting to a Device with Static IP Address

Format: LightwareDeviceController -i <IP_address>:<port>

Example: LightwareDeviceController -i 192.168.0.20:6107

The LDC is connected to a device with the indicated static IP address directly; the Device Discovery window is not displayed. When the port number is not set, the default port is used: 10001 (LW2 protocol). For LW3 devices use the **6107** port number.

Connecting to a Device via a Serial Port

Format: LightwareDeviceController -c <COM_port>:<Baud>

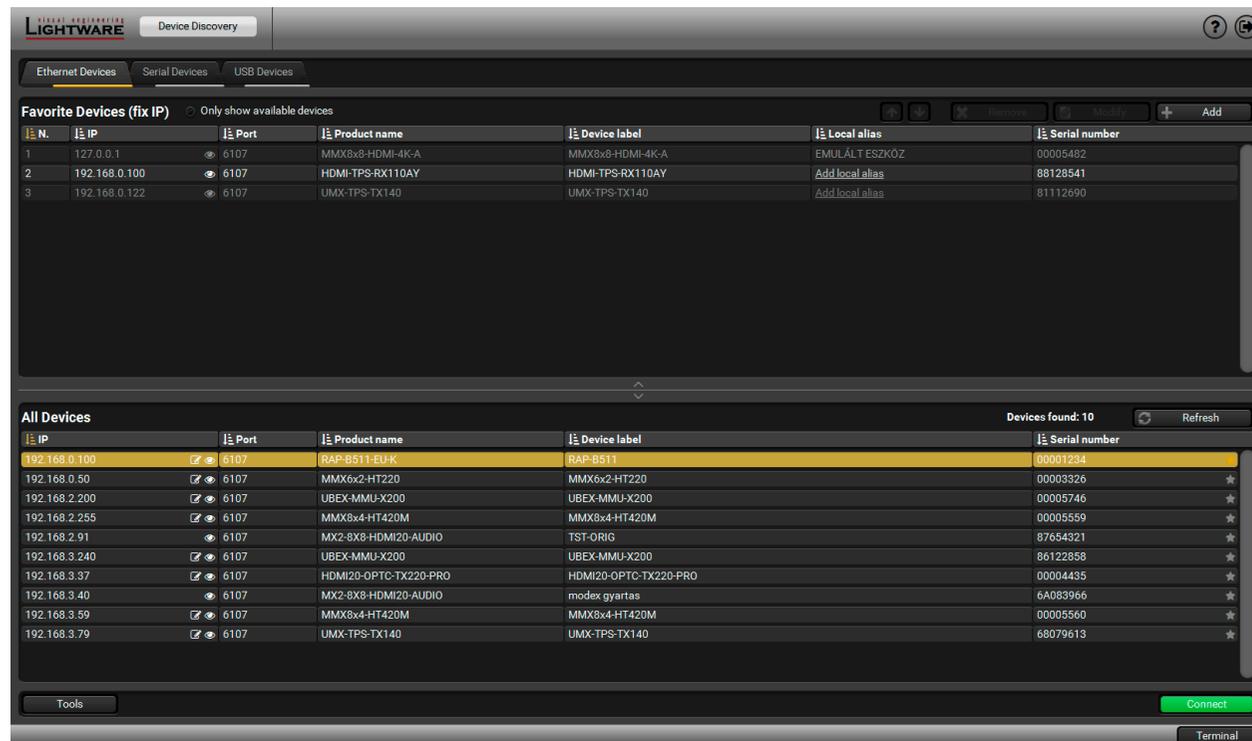
Example: LightwareDeviceController -c COM1:57600

The LDC is connected to a device with the indicated COM port directly; the Device Discovery window is not displayed. If no Baud rate is set the application will detect it automatically.

5.3. Establishing the Connection

Step 1. Connect the device to a computer via Ethernet (RS-232 or USB).

Step 2. Run the controller software; device discovery window appears automatically.



Device Discovery Window in LDC

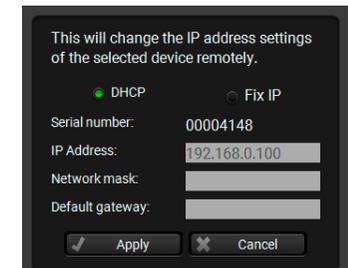
Step 3. Select the unit from the discovered Ethernet devices or under Serial devices; when the device is connected through RS-232 click on the **Query** button next to the desired serial port to display the device's name and serial number. Double click on the RAP-B511 or select the device and click on the **Connect** button.

ATTENTION! When the device is connected via the local RS-232 port, make sure that Control mode and LW3 protocol are set on the serial port.

Change IP Address



To modify IP address settings quickly it is not necessary to enter the device's settings/network menu, you can set them by clicking the pencil icon beside the IP address. In this window you can see only the new settings.

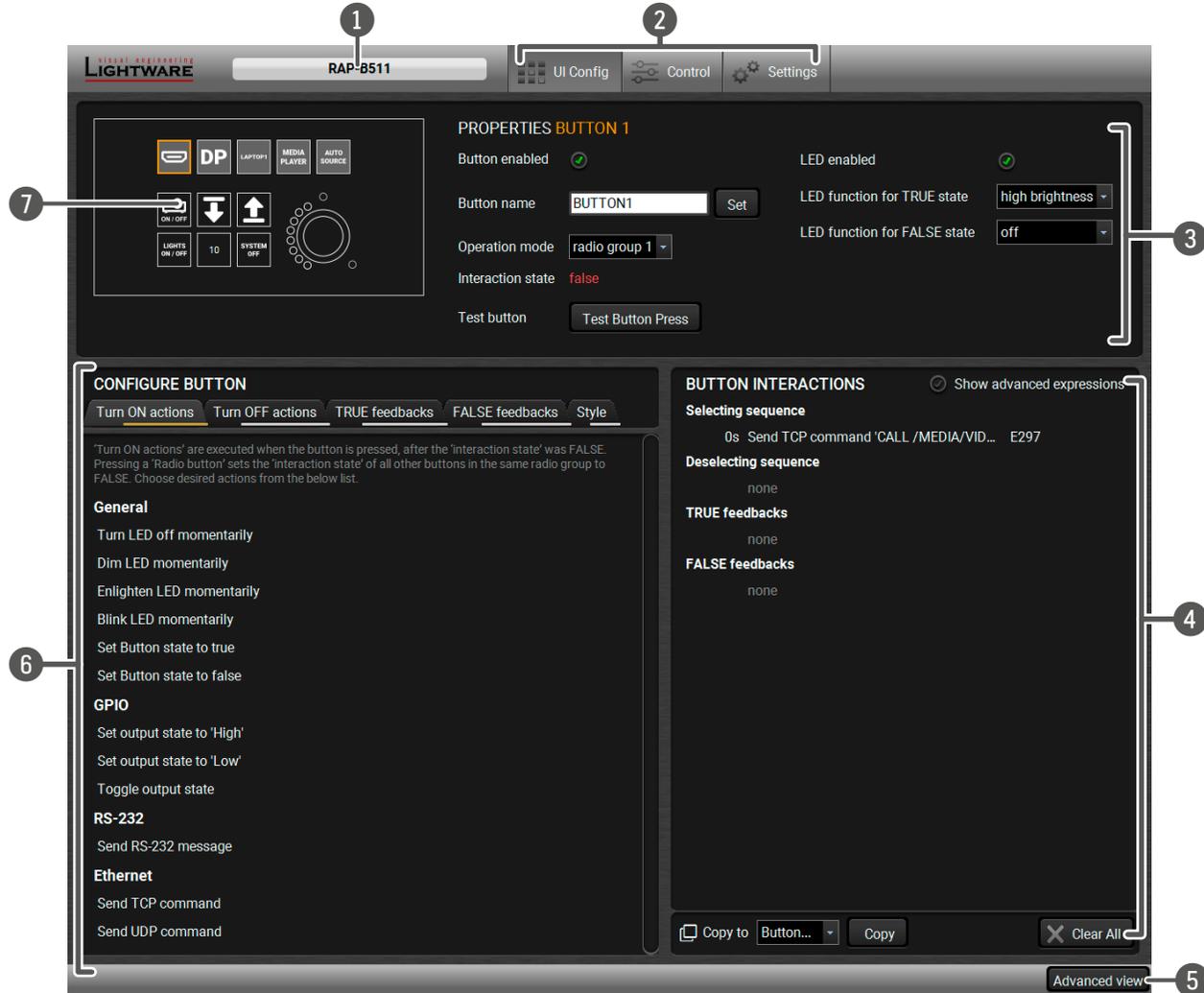


Identifying the Device



Clicking on the icon results the blinking of the LEDs for 10 seconds. The feature helps to identify the device itself.

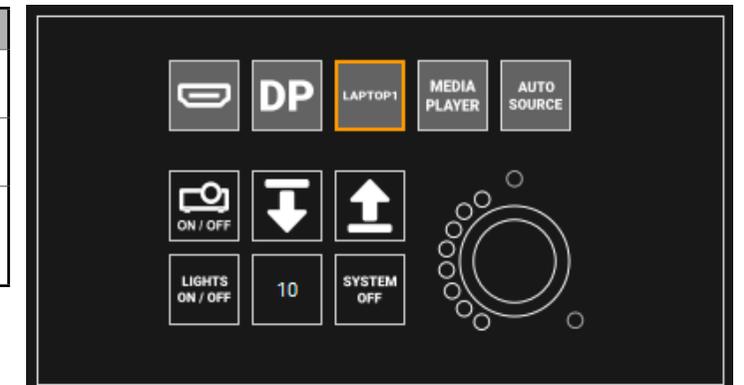
5.4. UI Config Menu



- 1 **Information ribbon** The label shows the device label which can be edited in the Settings menu - [Status](#) tab. Device discovery window can be displayed by clicking on this ribbon.
- 2 **Main menu** The available menu items are displayed. The active one is showed with dark grey background color.
- 3 **Button Properties** Basic button settings (e.g. button name, operation mode) can be done in this section. See more details in [Button Properties](#) section.
- 4 **Summary of the Button Interactions** This section contains all the defined events of the selected button. For more details about it, see [Button Interactions](#) section.
- 5 **Advanced View button** Displaying [Advanced View Window](#), showing the Terminal window and the LW3 protocol tree.
- 6 **Configure button section** The tabs consist of actions and conditions which can be set to the selected button. The tab denomination depends on the button operation mode. The wireframe view of the buttons can be customized by icons and text on the Style tab. For more details about it, see [Configure Button](#) section.
- 7 **Wireframe view** Wireframe view shows the configurable button (or the rotary) with **highlight color** and shows the buttons in the same radio group, too. Click one to select and adjust it.

Legend of the wireframe view

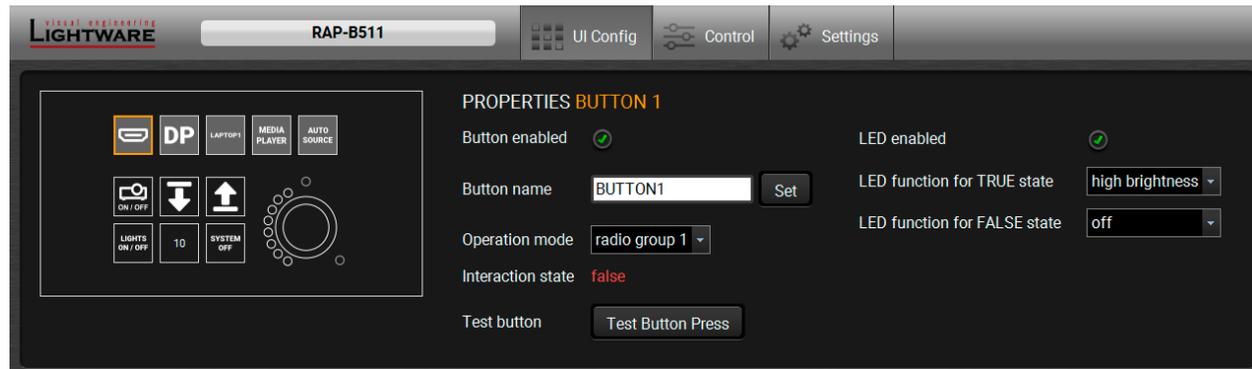
Icon	Sign	Explanation
	no highlight, black background	default view
	amber highlight	selected button
	grey background	member of the same radio group



5.4.1. Button Properties

Click the button icon on the wireframe view to display and modify the related configuration.

ATTENTION! Clicking the button icon on the wireframe view does not simulate the button click. **Test Button Press** button is for that purpose.



The following settings are available in the Button Properties section:

- **Button enabled:** The buttons can be enabled or disabled independently of each other (when the button is disabled, pressing it will have no effect).
- **Button name:** The button name can be 32 character-long, ASCII characters are allowed. Longer names are not accepted.
- **Operation mode:** Three modes are available: momentary, toggle, or radio group (1-5). For more details about the operation modes, see the [Buttons](#) section.
- **Interaction state:** Displays the current state of the selected button. For more information about the interaction states, see the [Buttons](#) section.
- **LED enabled:** LED function of the selected button can be turn on and off.
- **Test Button Press:** Press the **Test Button Press** button to test the buttonpress (indicates a virtual button press).
- **LED function for TRUE/FALSE state:** Six default button LED state can be set: off / low bright / high bright/ blink /slow blink / sine pulse
LED behavior changes depending on the interaction state. For more information, see the [Button LED Configuration](#) section.

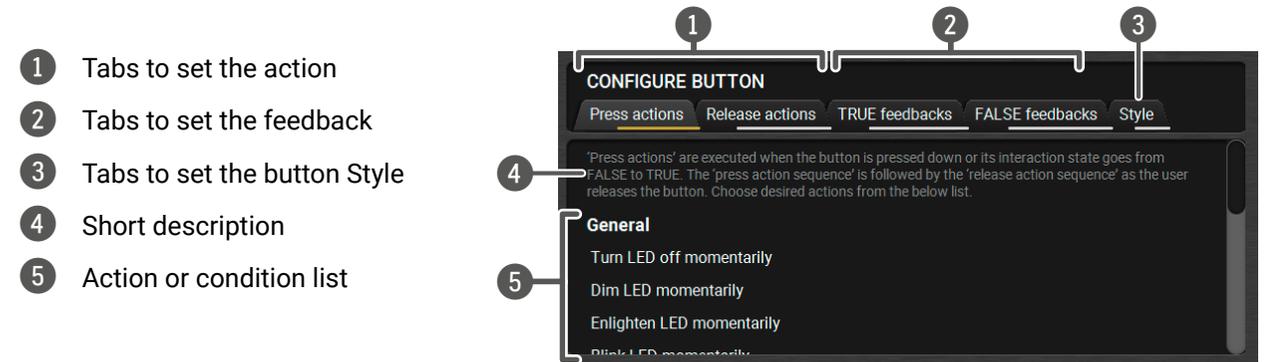
INFO: The intensity of the LED brightness can be customized in the Settings menu, on the Front panel tab. For more details see [Front Panel Settings](#) section.

5.4.2. Configure Button

This section provides a layout where button functions can be set quick and easy.

The first two configuration tabs are for **setting the Actions (outputs)** of the chosen button. In this case, the trigger **condition is always the same**. The second two tabs are for **setting the Feedbacks (conditions or inputs)** and the **action is fix**.

The tab denomination depends on the button operation mode. A short description gives a hint to choose the proper condition or action for the selected button.



Summary of the actions and feedbacks tabs

Button operation mode	Tab name	Action	Feedback (condition)
Momentary	Press actions	Choose the desired action from the list	Interaction state is true
	Release actions	Choose the desired action from the list	Interaction state is false
	TRUE feedbacks	Interaction state is true	Choose the desired condition from the list
	FALSE feedbacks	Interaction state is false	Choose the desired condition from the list
Toggle	Toggle ON actions	Choose the desired action from the list	Interaction state is true
	Toggle OFF actions	Choose the desired action from the list	Interaction state is false
	TRUE feedbacks	Interaction state is true	Choose the desired condition from the list
	FALSE feedbacks	Interaction state is false	Choose the desired condition from the list
Radio group 1-5	Turn ON action	Choose the desired action from the list	Interaction state is true
	Turn OFF action	Choose the desired action from the list	Interaction state is false
	TRUE feedbacks	Interaction state is true	Choose the desired condition from the list
	FALSE feedbacks	Interaction state is false	Choose the desired condition from the list

Button configuration steps:

- Step 1.** Choose the tab and click on the desired action or condition in the thematic list.
- Step 2.** Type the missing parameters (and the delay, if it is necessary) in the pop up window (on the right).
- Step 3.** Click **OK** to save. The configuration is saved as an Event in the [Event Manager](#). It can be seen in the event list, numbered backwards.

*Pop-up window of the action setting***Style the Buttons**

When the button has a function, the last step is to add a text or icon to the wireframe view. This layout will appear on the [Built-in Miniweb](#) and supports the identification of the virtual buttons with the front panel.



- 1 Tab of Style config.
- 2 Button icons (same with the device label stickers). Click one to set for the currently selected button.
- 3 Selected icon (highlighted with amber frame)
- 4 Button text entry field. Maximum three rows can be displayed for one button. 30 ASCII characters are allowed for all rows.
- 5 Click to clear the button style.
- 6 Click to open the Miniweb page in the web browser. For more details, see the [Built-in Miniweb](#) section.
- 7 This QR code contains the web address of the Miniweb page. It can be saved in png.

TIPS AND TRICKS: Using the same appearance of the button with the label on the physical device helps identify them easily.

5.4.3. Button Interactions

This section provides an overview of all defined events of the selected button. One line represents one event. It displays the delay time between the action and the condition, the condition or the action with the parameters, the event number, where the current setting is saved.

The icon shows that the event was not created from the UI config page. It means that an event was set in the [Event Manager](#), where the interaction state of the selected button was defined as an action or condition (e.g. /EVENTS/E3.Condition=/MANAGEMENT/UI/BUTTONS/BUTTON11.State=true)

Click on the icon to **Show advanced expression**. It displays the LW3 path of the event.

TIPS AND TRICKS: If the Show advanced expression mode is not active, keep the cursor on the event line for a second, and the whole expression appears in the hint box.



The following settings are available in this section:

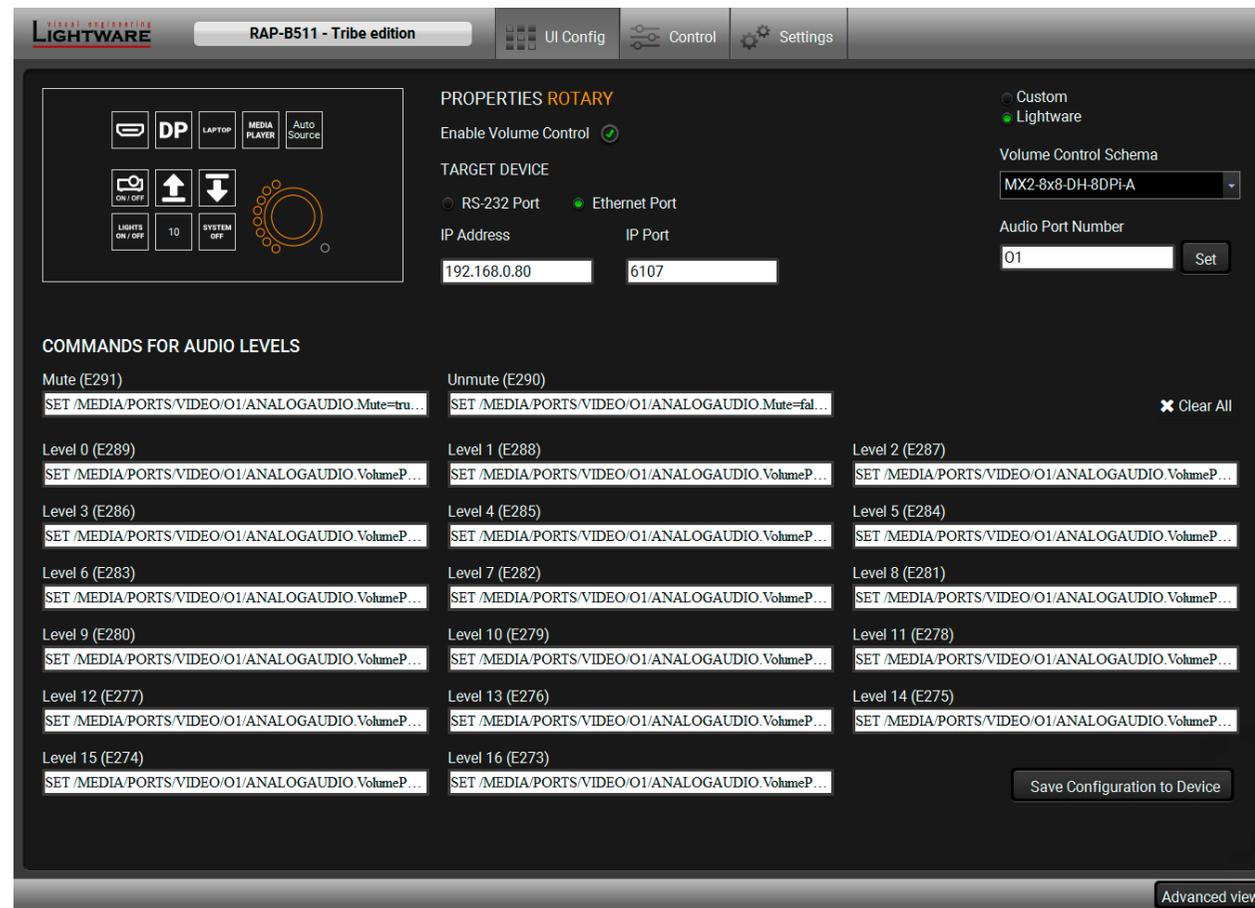
- The existing events can be edited by clicking on the event line (when it is highlighted with **amber**).
- Modifying the event properties is possible in the pop-up window.
- Click on the icon beside the event to delete it.
- All events of the button can be copied to another button. Choose a target button by clicking on the drop-down menu and press **Copy**.
- **Clear All** button is for deleting all events of the selected button.

5.4.4. Configurations of the Rotary

Click the rotary icon on the wireframe view to display and modify the related configuration.

The jog dial knob can be configured for volume control (or other controlling purposes). Turning left and right the rotary triggers the command sending via RS-232 or Ethernet.

Mute and unmute commands are assigned to the knob press, level 0-16 commands belong to the volume setting on a 16-level scale.



Follow the instructions to set the rotary:

Step 1. Choose an interface for the (volume) command sending (via RS-232 port or via Ethernet port). When the Ethernet is selected, IP address and port number are also required.

Step 2. Choose a volume control schema: **Custom** or **Lightware**.

a) **Custom** schema makes it possible to send serial or Ethernet messages to the third-party (or Lightware) device depending on the rotary state. Type the desired commands into the proper entry fields.

b) **Lightware** schema is for controlling the volume of the analog audio levels of the chosen audio port in any Lightware device. The entry fields are inactive, because the command schema is loaded automatically after setting the parameters:

- The target device can be selected by typing the device type or chosen from the device list/generic schema list in a drop-down menu. For more details about the generic schema see [Volume Control Schema Table](#)
- Write the audio port number (e.g. I2 or O8)
- Click **Set** to confirm. Commands are loaded into the list.

Step 3. Save the Schema by clicking **Save Configuration to Device** button. The configuration is saved to Events in the [Event Manager](#) (one event for one level settings). It can be seen in the event list, numbered backwards.

INFO: Rotary LEDs give feedback about the current position of the jog dial knob. As it is rotated right (and the volume increases), the LEDs turn on one-by-one. One level means half brightness.

Volume Control Schema Table

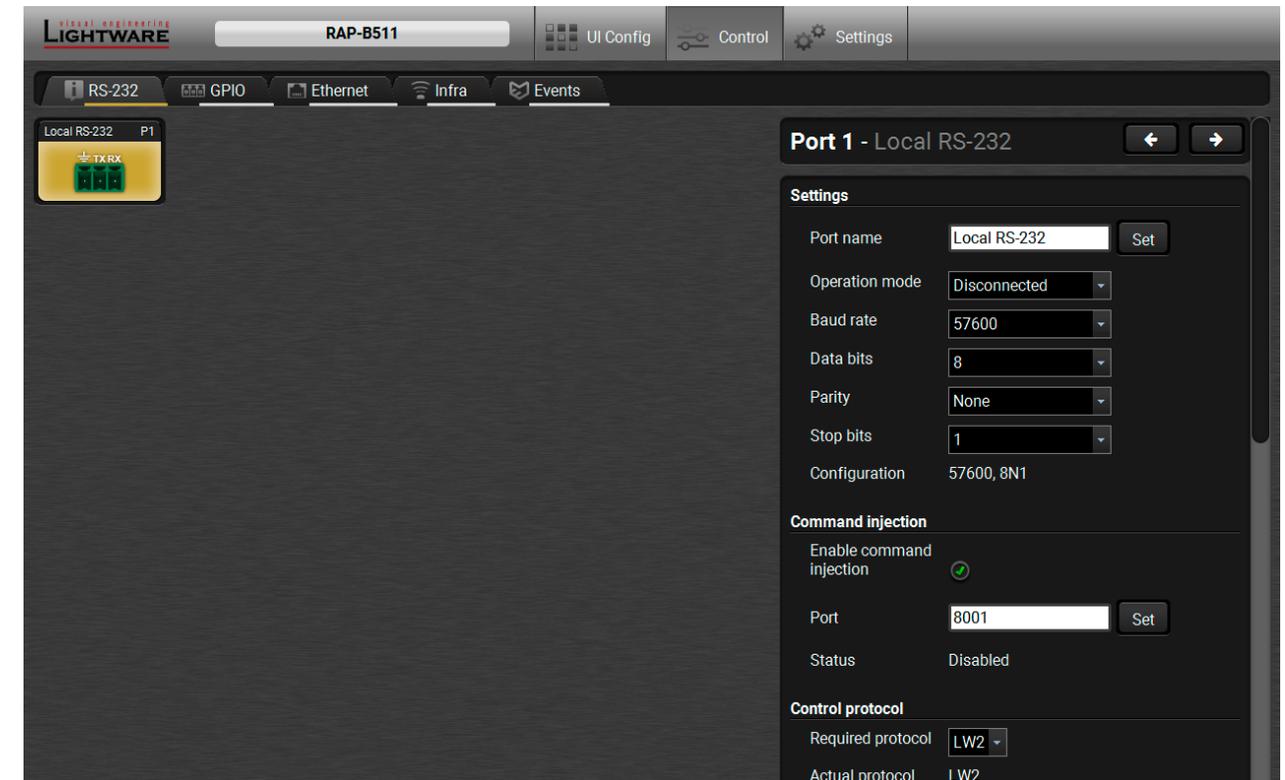
Generic schemes collect the Lightware devices by the same audio setting commands.

Schema ID	Device Type
Generic LWR-A	DP-TPS-TX220 DVI-HDCP-TPS-TX220 FP-UMX-TPS-TX120 FP-UMX-TPS-TX130 HDMI-3D-OPT-RX150RA HDMI-3D-OPT-TX220 HDMI-TPS-RX110AY HDMI-TPS-TX220 MMX4x2-HDMI MMX4x2-HT200 SW4-OPT-TX240 SW4-TPS-TX240 UMX-TPS-TX120 UMX-TPS-TX130 UMX-TPS-TX140 WP-UMX-TPS-TX120 WP-UMX-TPS-TX130
Generic LWR-B	MX2-16x16-DH-8DPi-A-R, MX2-24x24-DH-12DPi-A-R MX2-24x24-DH-24DPi-A-R, MX2-24x24-HDMI20-Audio MX2-24x24-HDMI20-Audio-R, MX2-32x32-DH-16DPi-A-R MX2-32x32-HDMI20-A-R, MX2-48x48-DH-24DPi-A-R MX2-48x48-DH-48DPi-A-R, MX2-48x48-HDMI20-A-R MX2-8x4-HDMI20-CA, MX2-8x8-DH-4DPi-A MX2-8x8-DH-8DPi-A, MX2-8x8-DH-8DPi-A MX2-8x8-HDMI20-Audio, MX2-8x8-HDMI20-Audio-L MX2-8x8-HDMI20-CA

Schema ID	Device Type
Generic LWR-C	MMX8x4-HT420M (mixer addon) MMX8x4-HT400MC (mixer addon)
Generic LWR-D	MMX6X2-HT200 MMX6X2-HT210 MMX6X2-HT220
Generic LWR-E	MX-FR (IB/OB-A) UMX-OPT-TX150R UMX-TP-TX100
Generic LWR-F	UBEX-PRO20-HDMI-F110, -F120

5.5. Control Menu

5.5.1. RS-232



RS-232 Tab in Control Menu

The following settings and functions are available on the local RS-232 port:

- Port name
- Operation mode: Control, Command Injection, or Disconnected (for more details about serial interface modes see the [Settings for Other Interfaces](#) section);
- Baud rate: 4800, 7200, 9600, 14400, 19200, 38400, 57600, 115200;
- Data bits: 8 or 9;
- Parity: None, Odd, or Even;
- Stop bits: 1, 1.5, or 2;
- Command injection: enable or disable;
- Command injection port number;
- Control protocol: LW2 or LW3;
- [Message recognizer](#)
- Message sending via serial port;
- Reloading factory defaults (see factory default settings in the [Factory Default Settings](#) section).

Message recognizer

RAP-B511 series button panel is able to analyze and store the received serial data. For more information see [RS-232 Recognizer](#) section.

Check **Enable message recognizer on this port** to switch the recognizer on.

Delimiter sequence text box is for setting the delimiter string in hex format. When this string is detected in the incoming serial data, the device saves the RS-232 message data from the first bit, to the delimiter (or the data between the two delimiters).

INFO: 0D0A is the factory default value, this is the hexadecimal code of Carriage Return and Line Feed. LW3 protocol commands end with this formula, so the default value support the recognition of the LW3 commands and the stored changes automatically.

If the **Timeout** is enabled and set, the received data is saved when the timeout is elapsed after the last received message.

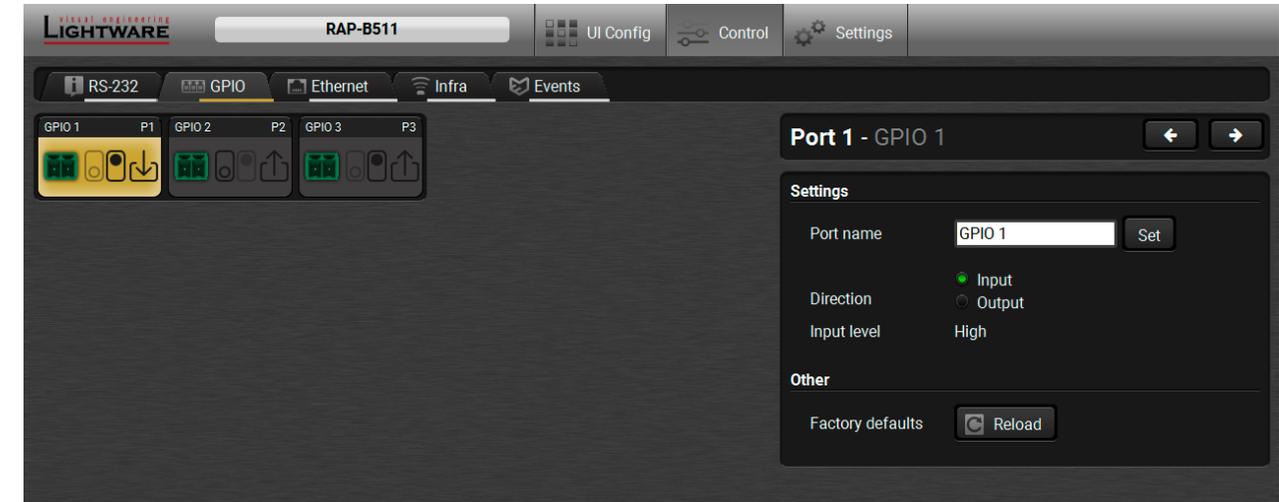
In **Received messages** box shows the last received and stored message in Text (RECOGNIZER.Rx), Hex (RECOGNIZER.RxHex), and Hash (RECOGNIZER.Hash) format. The Hex and Hash contains the delimiter.

Press the **Clear** button to erase this storage.

Clicking on **Reload** restores the [Factory Default Settings](#) of the recognizer.

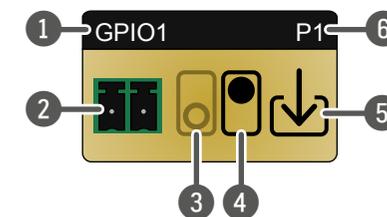
INFO: Message recognizer operates independently of the RS-232 mode.

5.5.2. GPIO



GPIO tab in Control menu

The GPIO port has 3 pins, which operate at TTL digital signal levels and can be controlled by LDC or protocol commands. Select a GPIO pin and under the Port settings section; the settings (pin direction and input level) are displayed on the port tiles as well:

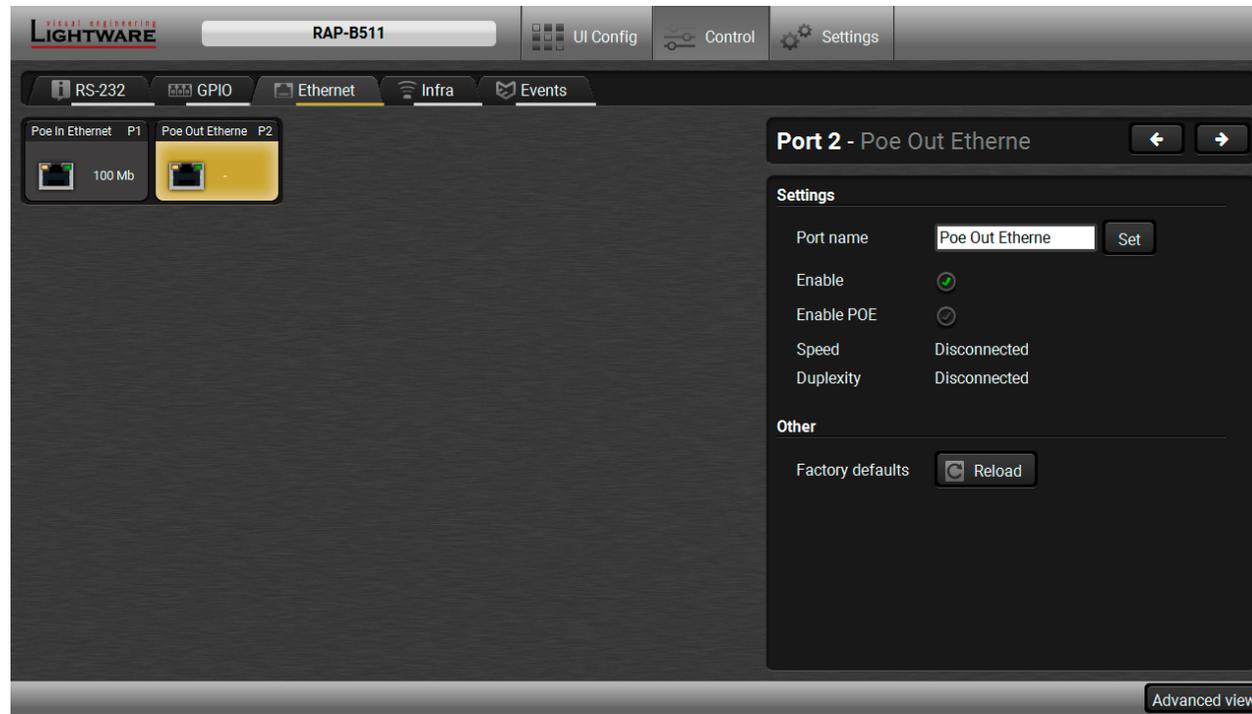


- | | | | |
|---|---------------------|---|---|
| 1 | GPIO pin name | 4 | High level indicator * |
| 2 | GPIO port icon | 5 | Pin direction:
Input: down arrow
Output: up arrow |
| 3 | Low level indicator | 6 | GPIO port number |

* Highlighted with black means the current setting.

INFO: Output level can be set only in case of setting the pin direction to Output. In case of input direction the output level setting and the Toggle button is not available.

5.5.3. Ethernet



Ethernet tab in Control menu

Poe In Ethernet (P1) and PoE Out Ethernet (P2) ports are displayed on this tab. The status of the Ethernet line can be checked by each ports: the speed and the duplexity of the connection.

The following settings are available for the local port:

- Enable / disable the port (for loop protection);
- Only on P2 port: Enable / disable PoE;
- Reloading [Factory Default Settings](#).

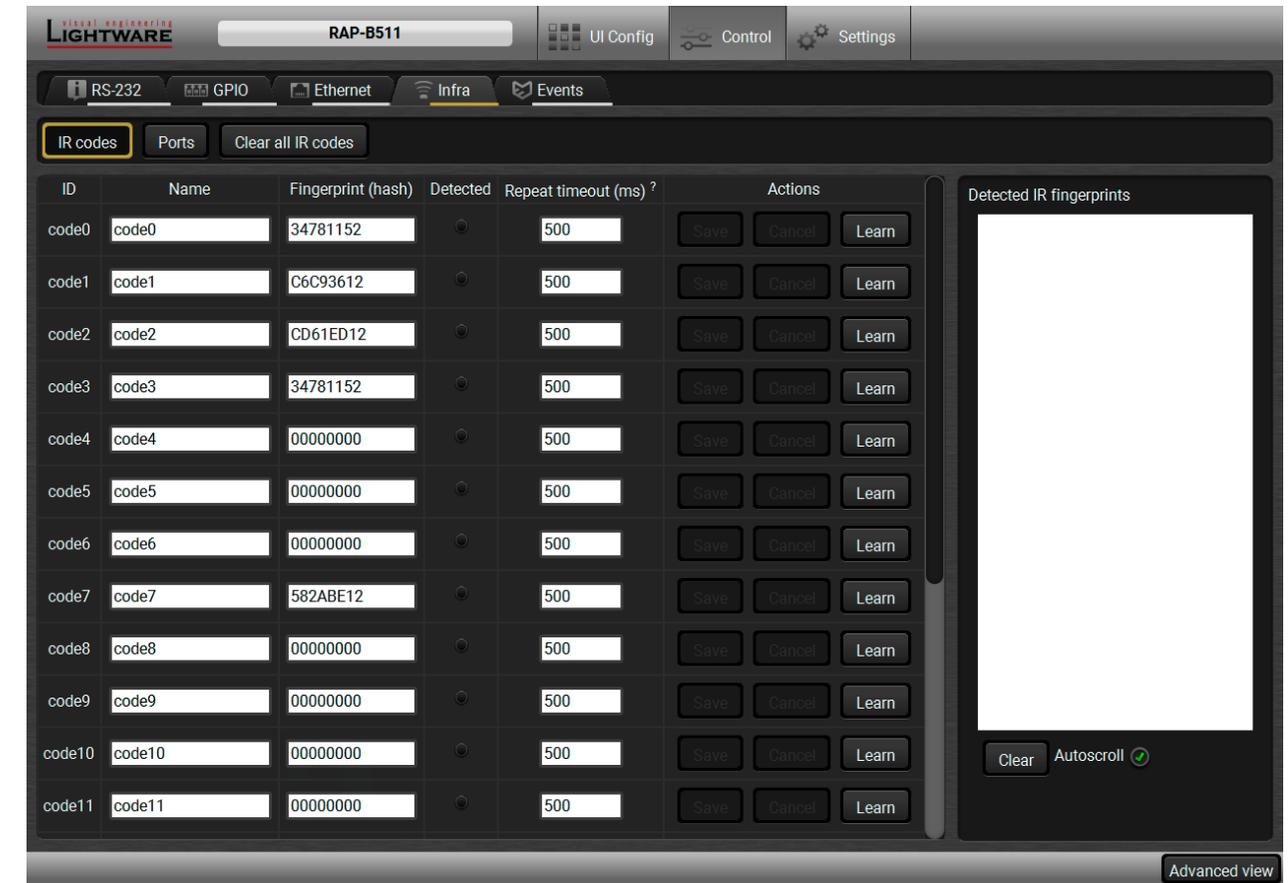
ATTENTION! If the Ethernet port is set to disabled, this may break the connection with the device.

5.5.4. Infra

Infra-Red (IR) receiver options can be found on this tab. There are three submenus available under it: **IR codes**, **Ports**, and **Clear all IR codes**.

IR Codes

The user can set the name of the IR code, the fingerprint (hash), and the repeat timeout in ms, actions can be ordered to each IR code as well.



IR Codes Window in Control Menu

Description	Function
ID	Code number.
Name	You can give an unique name for the desired code.
Fingerprint (hash)	Fingerprint code in pronto hexa format.
Detected	Indicator gives feedback about the given IR code is detected currently.
Repeat timeout (ms)	You can set a timeout to avoid the involuntary code recurrence.
Actions	Action buttons for the desired IR code: Save: saving the fingerprint. Cancel: canceling the fingerprint. Learn: learning the detected IR code.
Detected IR fingerprints	You can check the detected IR codes in this panel. Pushing Clear button deleting all current fingerprints and switch on or off the automatic scrolling with the Autoscroll pipe.

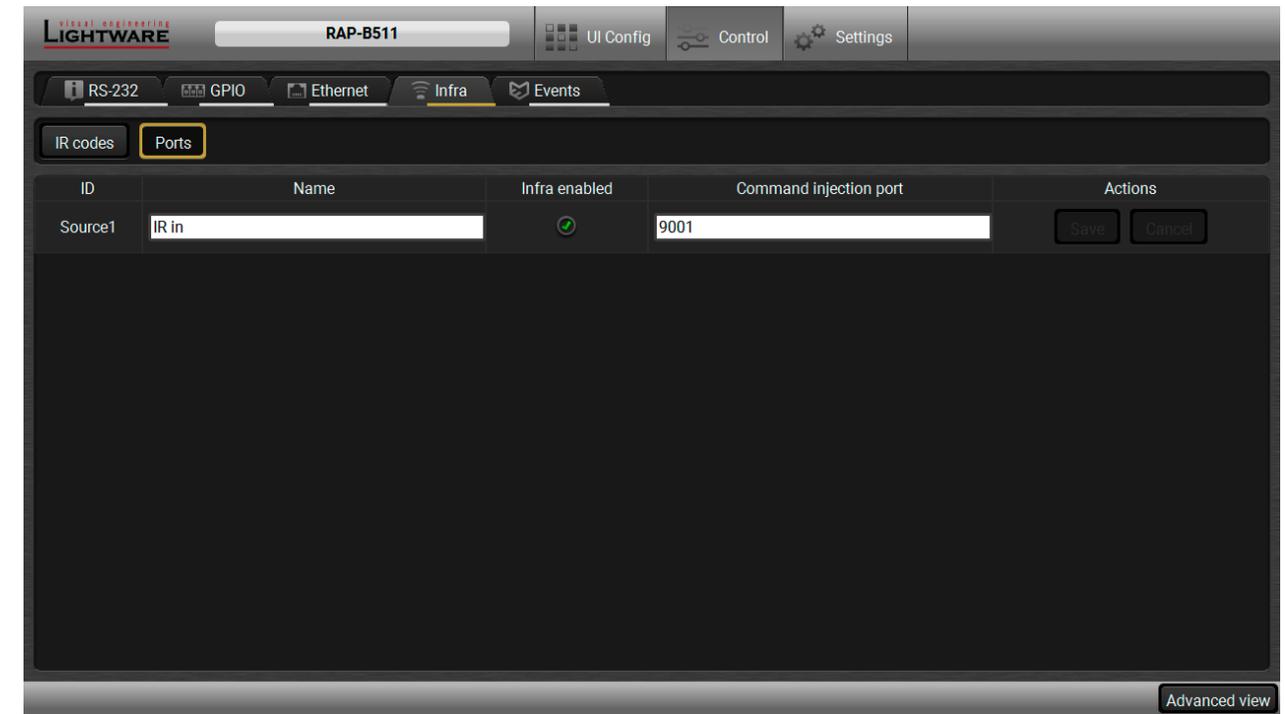
20 fingerprints can be stored in the device at the same time. Each of them can be ordered to an action in [Event Manager](#).

Learning IR Codes

- Step 1.** Click on the **Learn** button.
- Step 2.** Turn the remote controller to the IR detector. A pop-up window appears in LDC - press your remote button to learn.
- Step 3.** Once the code is received, a new window pops up in LDC - learning completed. Click **OK** to continue.
- Step 4.** Optionally type a unique name for the code in the **Name** text box. The default name is code#, e.g. code0.

Ports Tab

User can set the name and command injection port to each sources and destinations. For more details about IR interface see the [Infra Interface](#) section.



Infra Tab - Ports Window

Clear all IR codes

Clicking on the button results deleting all stored IR fingerprints.

5.6. Event Manager

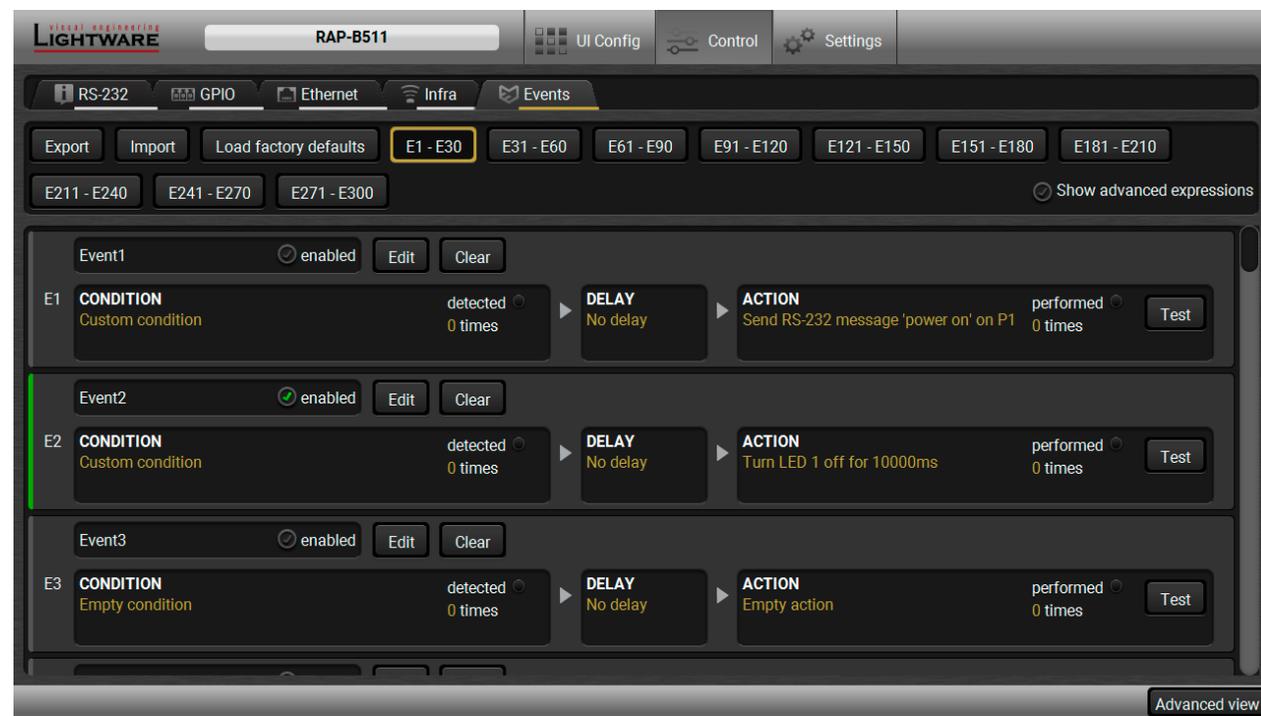
The feature means that the device can sense changes on its ports and able to react according to the pre-defined settings. The development idea of the Event manager is based on users' feedbacks. In many cases internal events are necessary to display but it is not easy when the device is hard to access (e.g. built under the desk).



The Event manager can be configured to perform an action if a condition has been detected. E.g. the desired setup is that after a certain type of IR signal has been detected on S1 port, the device send an RS-232 message. The settings can be done via the LDC in the Control/Events tab, or by LW3 protocol commands. Configurable events number depends on the device what you are using actually.

Numerous new ideas and requests have been received in connection with the features and settings of the Event manager since the first release. Therefore, the user interface has been re-designed and many new functions implemented. The Event editor can be opened by pressing the **Edit** button at each Event.

There is a **grey bar** on the left of the Event panel in each line. If a condition and an action are set and the Event is enabled, the bar is displayed in **green**.



Control menu, Event Manager tab

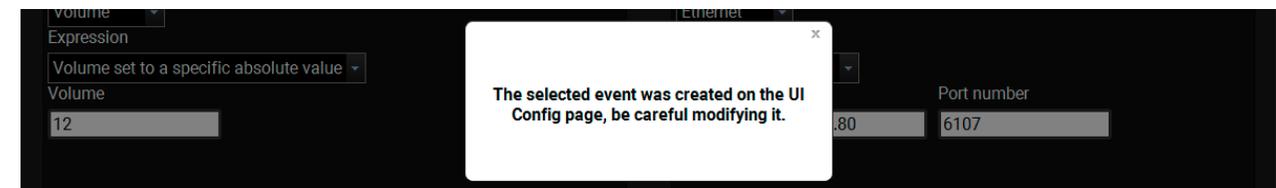
5.6.1. Event Manager in the RAP-B511 series

The functionality of the Room Automation Panel is based on the Event Manager. UI config page provides an interface where the events can be set easily and they are saved in the Event Manager. Events from the UI config page are listed backwards (e.g. first event is saved to the E300 slot).

These events are identified by the event name property, which refers to the button (e.g. UIConfig_B11_1) or the rotary position (e.g. UIConfig_ROT_13).

ATTENTION! Rename the Events from the UI Config page is highly not recommended!

When one of these events is opened to Edit in the Event Manager, the warning message appears:



The tables below summarize the availability of the conditions and actions of the RAP-B511.

Conditions

Launch configuration from...	...UI config menu	...Event Manager
Button press /button release	✓	⚠
Rotary turn / rotary press	✓	⚠
Real-time clock	✗	✓
Infra detector	✗	✓
RS-232 recognizer	✗	✓
GPIO input level change	✗	✓

Actions

Launch configuration from...	...UI config menu	...Event Manager
Button LEDs	✓	⚠
Button Interaction State	✗	⚠
Ethernet	✓	✓
RS-232	✓	✓
GPIO	✓	✓

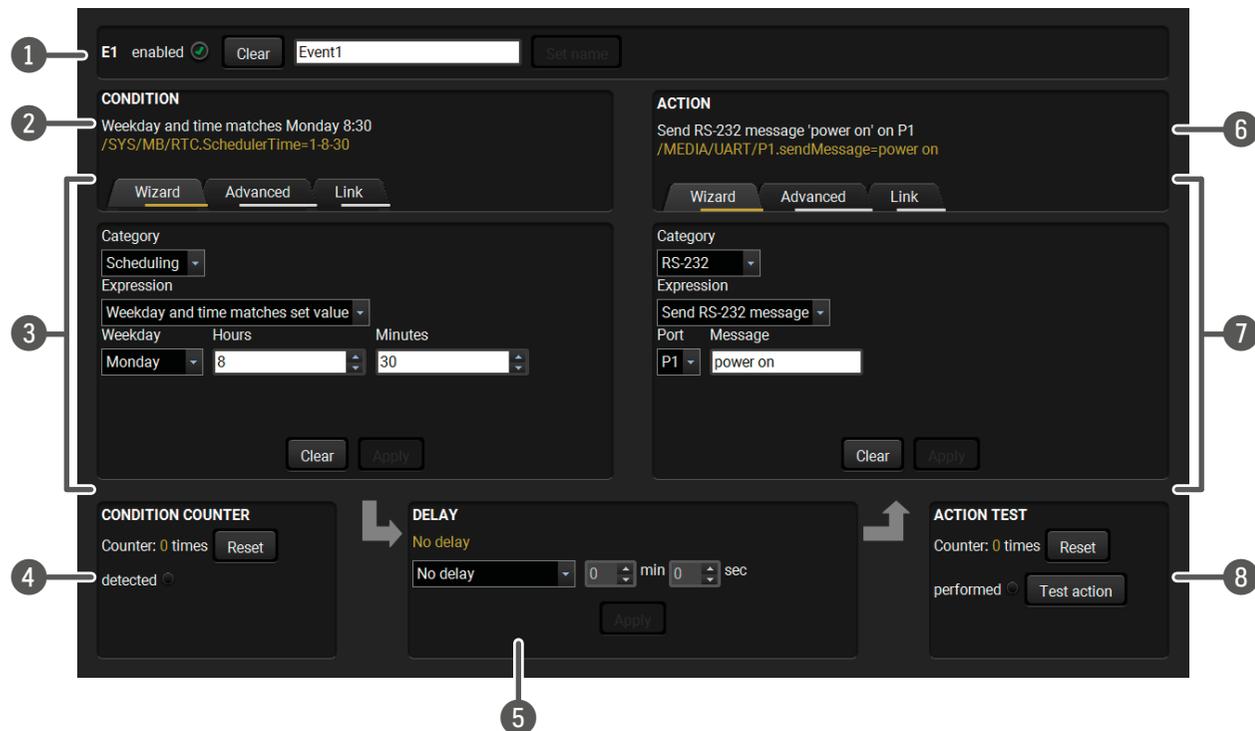
✓ The setting is available and recommended to do the configuration from this menu.

✗ The setting is not available in that menu.

⚠ Only for advanced users! The setting is available in the Event Manager, but doing the configuration is highly recommended from the UI config menu.

5.6.2. The Event Editor

Press the **Edit** button in the desired Event line to open the Event editor window.



- 1 **Event header** The name of the Event is displayed. Type the desired name and press the Set name button. The Event can be cleared by the **Clear** button. Use the tick mark to enable/disable the Event.
- 2 **Condition header** If the condition is set, the description (white colored text) and the exact LW3 protocol expression (yellow colored text) can be seen. If the advanced mode was used the description is **Custom condition**.
- 3 **Condition panel** The Wizard, the Advanced or the Link tool is available to set the condition. The parameters and settings are displayed below the buttons.
- 4 **Condition test** The set condition can be tested to see the working method in the practice.
- 5 **Delay settings** The action can be scheduled to follow the condition after the set time value.
- 6 **Action header** If the action is set, the description (white colored text) and the exact LW3 protocol expression (yellow colored text) can be seen. If the advanced mode was used the description is **Custom action**.
- 7 **Action panel** The Wizard, the Advanced or the Link tool is available to set the action. The parameters and settings are displayed below the buttons.
- 8 **Action test** The set action can be tested to see the working method in the practice.

5.6.3. Create or Modify an Event

Wizard Mode

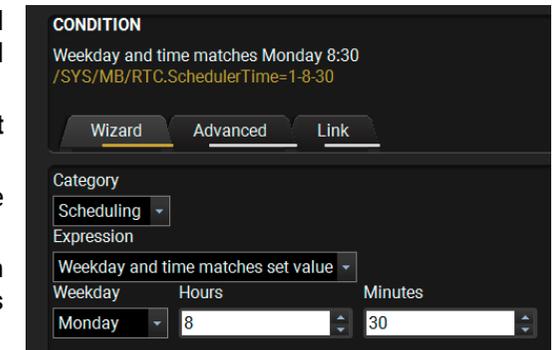
The wizard mode lists the most common conditions and actions, so the user does not have to look for LW3 nodes and properties.

Step 1. Click on the **Edit** button of the desired Event; the **Event editor** is displayed.

Step 2. The wizard mode is displayed as default. Select the desired **Category** first (e.g. Audio or Video).

Step 3. Select the desired **Expression** from the drop-down menu. If any other parameter is necessary to set, it is going to be displayed.

Step 4. Press the **Apply** button to store the settings of the Condition.



Advanced Mode

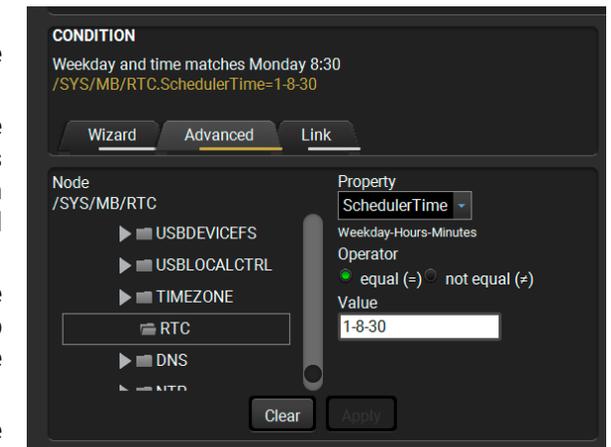
The goal of this mode is the same as of the wizard: set the properties and methods for conditions and actions. The difference is the number of the available and usable properties and methods of the LW3 protocol. Advanced mode allows almost all of it.

Step 1. Click on the **Edit** button of the desired Event; the **Event editor** is displayed.

Step 2. The wizard mode is the default, press the **Advanced** button. The LW3 protocol tree is displayed showing the list of the properties in the drop-down menu. Navigate to the desired node.

Step 3. Select the desired **Property** from the menu. The **manual** of the property is displayed below to help to select the necessary property and to set the value.

Step 4. Set the desired **value** and **operator**, then press the **Apply** button to store settings.

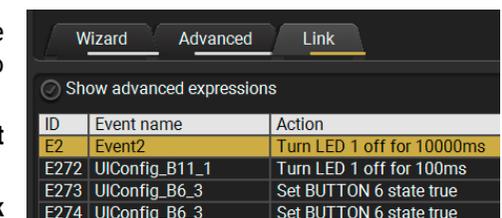


The Link Tool

The new interface allows creating more actions for the same condition. In that case, a condition can trigger more actions. To set such an Event, the Link tool has been introduced.

Step 1. Click on the **Edit** button of the desired Event; the **Event editor** is displayed.

Step 2. The wizard mode is displayed as default, press the **Link** button.



Step 3. All the saved Events are analyzed and the **conditions** are listed (it takes some seconds to finish). The **Show advanced expressions** option allows showing the exact path and set the value of the given property.

Step 4. Select the desired **Condition** and press the **Apply** button to store the settings.

5.6.4. Special Tools and Accessories

The Name of the Event

The name of a port can be changed by typing the new name and clicking the **Set** button. The following characters are allowed when naming:

Letters (A-Z) and (a-z), numbers (0-9), special characters: hyphen (-), underscore (_), and space ().

Enable or Disable an Event

The set Event can be enabled or disabled in the Event list, or directly in the Event editor window by setting the **tick mark** beside the name.

Testing the Condition

When the desired Condition is arranged, the setting can be tested. The Event list and the Event editor contains a small panel that shows if the set condition is detected and how many times. The **Counter** can be reset by the button in Event editor. If the Condition is true, the **detected** mark turns green for two seconds and the **Counter** is increased.

Testing the Action

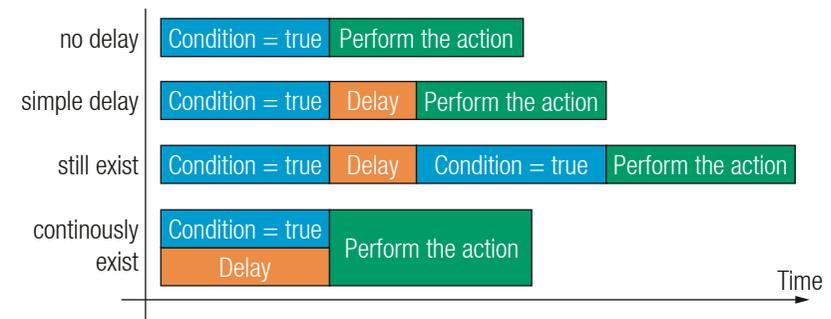
The method is the same as testing the Condition, but in this case, the Action can be triggered manually by pressing the **Test** button.

TIPS AND TRICKS: The Test button is also placed on the Action panel in the Event list. Thus, you can check the Actions without opening the Event editor.

Delay the Action

In most cases the Action is performed immediately after the Condition is detected. But sometimes a delay is necessary between the Condition and the Action. Therefore, the new Event manager contains the Delay panel which allows that feature with below settings:

- **No delay:** when the Condition is detected, the Action is launched.
- **Simple delay:** when the Condition is detected, the Action is launched after the set time interval.
- **Still exists:** when the Condition is detected, the Action is launched after the set time interval only if the Condition still exists.
- **Continuously exists:** when the Condition is detected, the Action is launched after the set time interval only if the Condition has been existing continuously.



The available delay settings of an Event

TIPS AND TRICKS: **Show advanced expressions** option is a useful tool when you look for the path or value of a property but just the expression is displayed. The option is available in the Event list window or when Link tool is used.

5.6.5. Clear One or More Event(s)

Clear an Event

Press the **Clear** button in the Event list or in the header section in the Event editor.

Clear all Events

When all the Events must be cleared press the **Load factory defaults** button above the Event list. You will be prompted to confirm the process.

WARNING! Clicking on **Load factory defaults** button means, the configuration of the buttons are also deleted, because the conditions and the actions of the buttons are saved as events.

5.6.6. Export and Import Events

The feature allows saving all the Events. The backup file can be uploaded to another RAP-B511 series device.

Export all the Events

Step 1. Press the **Export** button above the Event list.

Step 2. The Save as dialog box will appear. Set the desired folder and file name, then press the **Save** button.

The generated file is a simple text file which contains LW3 protocol commands. The file can be viewed by a simple text editor, e.g. Notepad.

ATTENTION! Editing the file is recommended only for expert users.

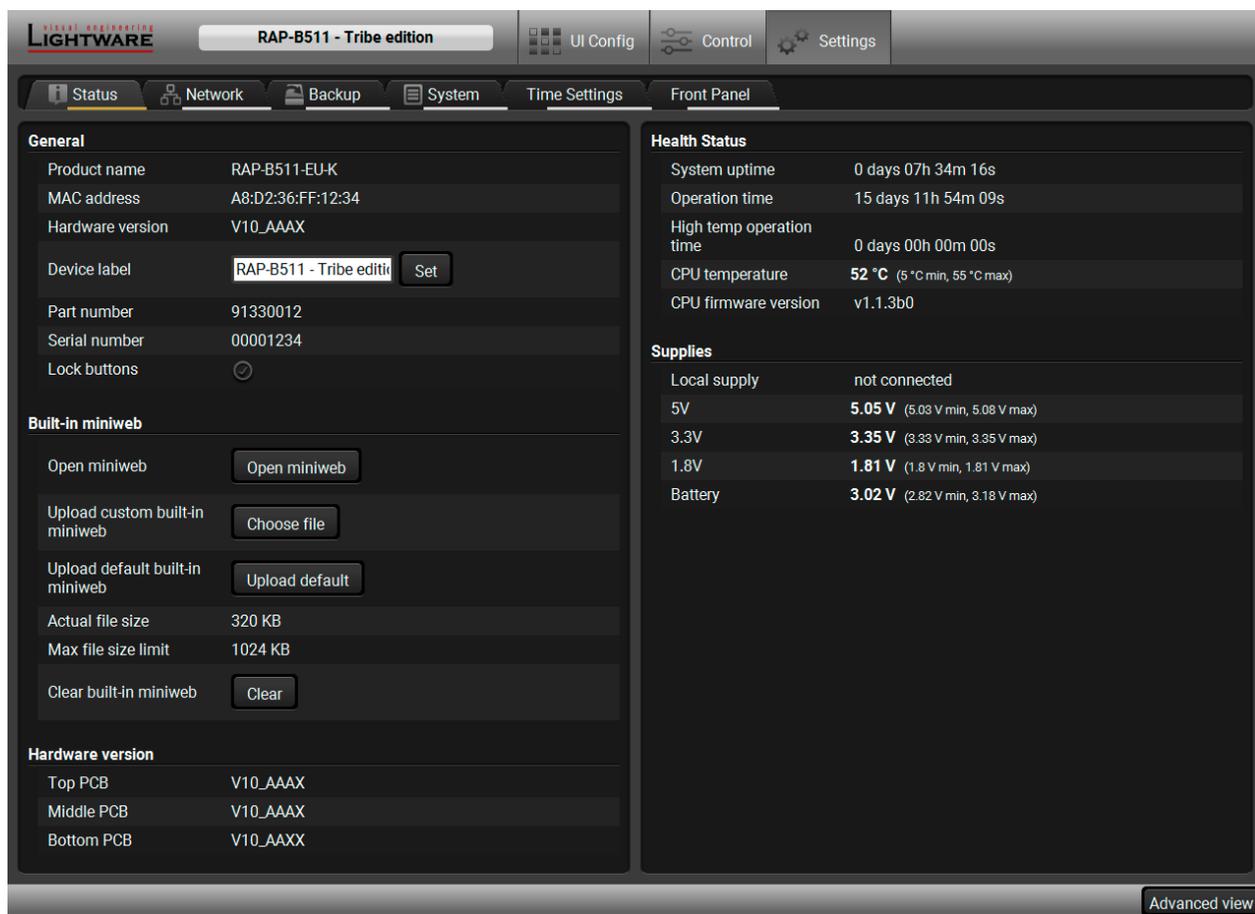
Import all the Events

Step 1. Press the **Import** button above the Event list.

Step 2. The Open dialog box will appear. Select the desired folder and file, then press the **Open** button.

5.7. Settings Menu

5.7.1. Status



Status Tab in Settings Menu

The most important hardware and software related information can be found on this tab: hardware and firmware version, serial numbers, temperatures, operation time, and voltage information. Device label can be changed to unique description by the **Set** button.

Enable **Lock buttons** disables the whole functionality of the front panel (buttons and the rotary). Blinking of the button and rotary LEDs three times means, that the front panel functionality is locked. Unlocking is also possible via LW3 protocol commands (for more details see [LW3 Programmers' Reference](#) section).

For more details about the Miniweb see [Built-in Miniweb](#) section.

5.7.2. Built-in Miniweb

Built-in Miniweb feature supports to reach certain functions of the RAP-B511 in the web browser.

The RAP-B511 has three different type miniweb pages for different purposes:

- **Default Miniweb Page:** This interface provides similar functionality to the front panel.
- **Advanced Miniweb Page:** Action trigger buttons of the selected events are displayed on this page.
- **Custom Miniweb page:** Any .html site with custom content can be upload to the device.

General system requirements

- System requirements for **operating systems:** Microsoft Windows XP, Windows Vista, Windows 7, Windows 10, macOS, Linux.
- Compatible **web browsers:** Mozilla Firefox, Google Chrome, Apple Safari.

Lightware system requirements

- Firmware package: the Miniweb is available from firmware package v1.1.3. The default control page can be installed in the device during the first firmware upgrade process if the necessary parameter is enabled. See the [Firmware Upgrading Steps](#) section.
- **Lightware Device Controller** software supports the Miniweb feature above v1.33.1b1.

ATTENTION! Please be sure that the computer is in the same network as the RAP-B511. If the computer has multiple Ethernet connections (for example Wi-Fi and LAN connections are used simultaneously) you will have to know the IP address for the one that is used for controlling the automation panel.

Default miniweb page

This interface provides similar functionality to the front panel. Clicking on the button icon has the same effect as the buttonpress (or clicking on the **Test Button Press** button in the LDC). The volume control is available with the scrollbar. Button styles help to identify the buttons.

INFO: Button configuration settings of the RAP-B511 are not available in the Built-in miniweb page, because it is designed for common usage.

To **activate** the Default Miniweb page click on the **Upload default** button in the Settings menu/ Status tab.

The website can be easily reached:

- **Write the IP address** of the device in the search bar of the web browser.
- Launch the LDC, connecting to the device, navigate to **Settings/Status** or **UI Config/Style** and pressing the **View miniweb** button.
- In the **UI Config/Style** tab, the **QR code** of the web address of the miniweb page is available and it can be download in .png format and print or display where the RAP-B511 is needed to control.

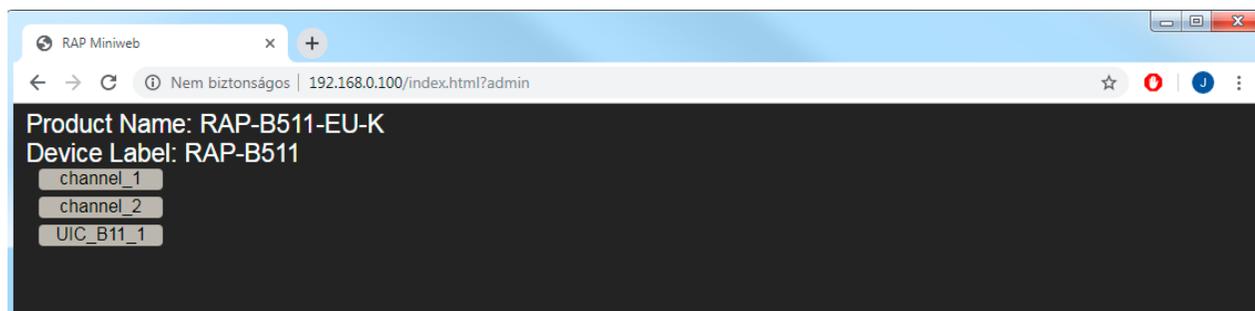
To **delete** the Default Miniweb page click on the **Clear** button.



Advanced Miniweb Page

The Advanced Miniweb is available by opening the web browser with this address:
http://<device_IP_address>/index.html?admin

The action trigger buttons can be used to perform a configured Event Action without waiting for the condition to occur. This can be done remotely by a mobile device, too. The buttons of Action triggers section are linked to Actions of certain Events in the Event Manager.

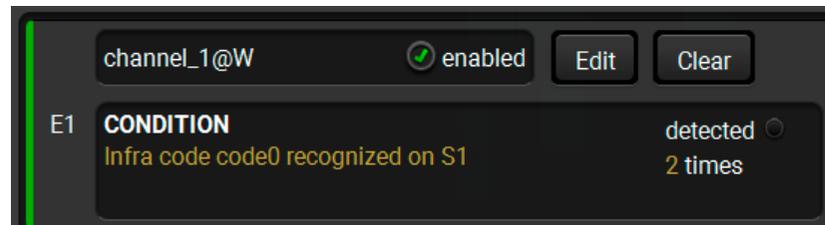


Advanced Miniweb Page

These buttons are displayed **only** for specific events:

- Any Event which does **not** have the @W suffix in its name will **not** be displayed as a trigger button.
- The displayed trigger buttons will get a **text label** with the **event name** except the suffix.

To add the desired Action as a button, append the name of the desired Event with the @W characters - see below:



To **delete** the Advanced Miniweb page click on the **Clear** button.

Custom Miniweb page

The control page can be replaced in the LDC; navigate to the Settings/Status page. A custom HTML file can be uploaded by pressing the Choose file button. Pay attention to the size of the HTML file. Only one file is allowed and the maximum file size is 1024 KB. The default control page can be restored during a firmware upgrade process, see the [Firmware Upgrading Steps](#) section.

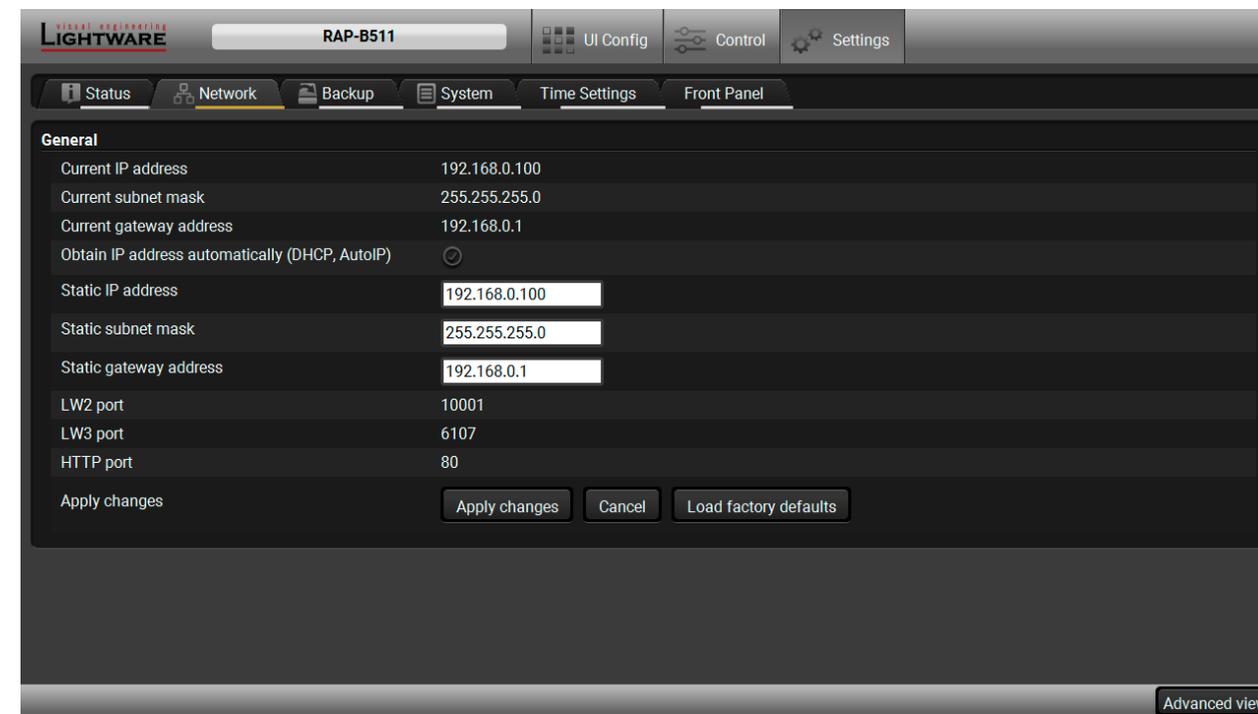
Press the **Clear** button to remove the control page. In this case, status information becomes available about the device.

Manufacturer Name	Lightware Visual Engineering
Device Name	RAP-B511-EU-K
Part Number	91330012
Hardware Version	V10_AAAX
Serial Number	00001234
Boot IP Address	192.168.0.100
Up time	17747
Mcu Firmware	v1.1.3b0
Control Software	software.lightware.eu
	Download log

Miniweb Status Page

INFO: Status information is always available at http://<device_IP_address>/status.html page.

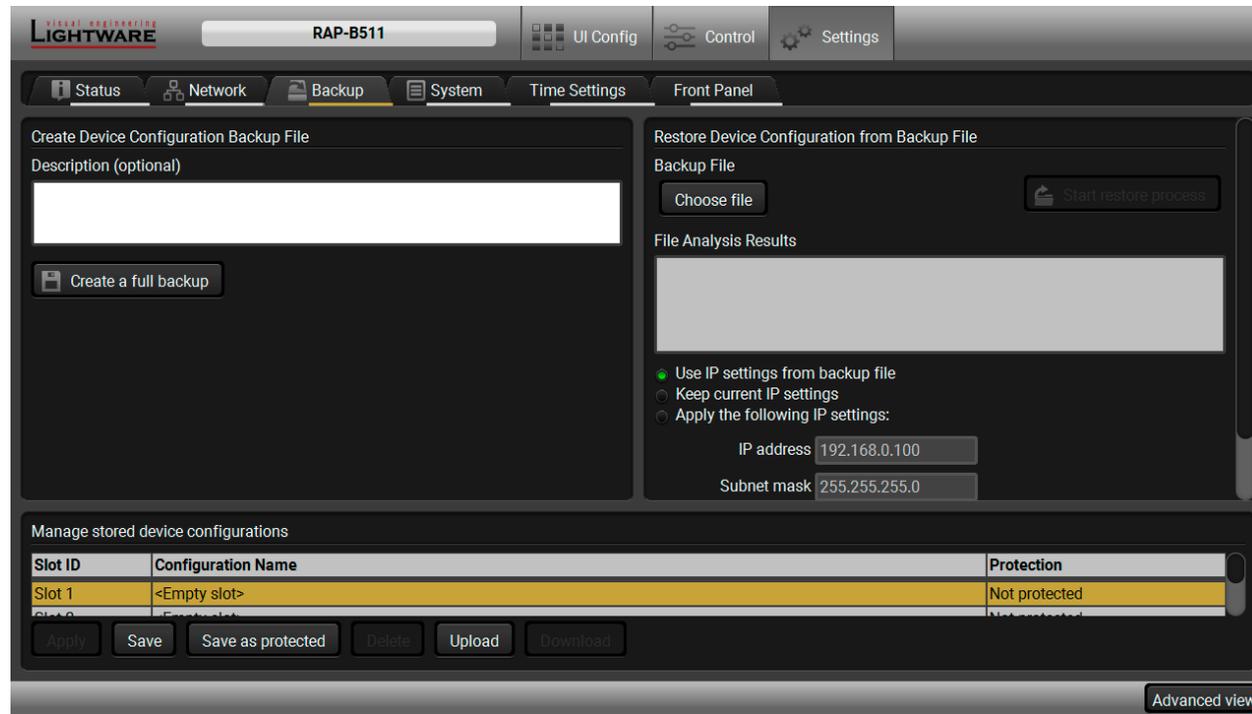
5.7.3. Network



Network tab in Settings menu

IP address and DHCP settings can be set on this tab. Always press the **Apply settings** button to save changes. [Factory Default Settings](#) can be recalled with a dedicated button.

5.8. Configuration Cloning (Backup Tab)



Backup tab in Settings menu

The configuration cloning of Lightware LW3 devices is a simple method that eliminates the need to repeatedly configure certain devices to have identical (non-factory) settings. If the devices are installed in the same type of system multiple times then it is enough to set up only one device to fit the user's needs and then copy those settings to the others, thus saving time and resources.

5.8.1. Cloning Steps in a Nutshell

Installing multiple devices with the same customized configuration settings can be done in a few easy steps:

- Step 1.** Configure one device with all your desired settings with the LDC software.
- Step 2.** Backup the full configuration file to your computer.
- Step 3.** If needed, make some modifications to the configuration file using a text editor (e.g. Notepad). E.g. modifying the static IP address is needed when DHCP is not used.
- Step 4.** Connect to the other device which has to be configured and upload (restore) your configuration file.
- Step 5.** Done! You can have as many totally identical, customized devices as you like.

5.8.2. Save the Settings of the Device (Backup)

- Step 1.** Apply the desired settings in the RAP-B511 (events, serial settings, etc.)
- Step 2.** Select the Settings / Backup tab from the menu.
- Step 3.** Write a short description in the text box on the left (optional).
- Step 4.** Press the Create a full backup button. You will be prompted to save the file to the computer. The default file name is the following:

backup_<DEVICE LABEL>_SN<SERIAL NUMBER>.LW3

- Step 5.** Set the desired file name, select the folder and save the file.

TIPS AND TRICKS: Using the exact product type in the filename is recommended since it makes the file usage more comfortable.

About the Backup File

The backup file is a simple text file which contains LW3 protocol commands. The first line is the description, and the further lines are the commands which will be executed during the restore process. The file can be viewed (and/or edited) by a simple text editor, e.g. Notepad.

ATTENTION! Editing the command lines is only recommended for expert users.

See the entire list of saved data in the Content of Backup File section.

5.8.3. Upload the Settings to a Device (Restore)

WARNING! Please note that the settings will be permanently overwritten with the restored parameters in the device. Withdrawal is not possible.

ATTENTION! The cloning is successful when the backup file is downloaded from the same type of source device as the destination device.

The Restoring Process

- Step 1.** Select the **Settings / Backup** tab from the menu.
- Step 2.** Click on the **Choose file** button on the right panel and browse the desired file.
- Step 3.** The file is checked and the result will be displayed in the textbox below. If the file is correct, the settings can be restored.
- Step 4.** Choose IP settings what you want to use after backup. You can apply settings from the backup file, keep actual settings, set it manually in a dialog box or apply DHCP.
- Step 5.** Press the **Start restore process** button and click on the Yes button when asked.
- Step 6.** Reboot the device to apply the network settings after finishing.

5.8.4. Create and Restore Backups from the Device Memory

The RAP-B511 is able to store backups in its own memory. It can be recalled from the device, so user does not need to save backup files to the local computer. Four slots are available for this purpose.

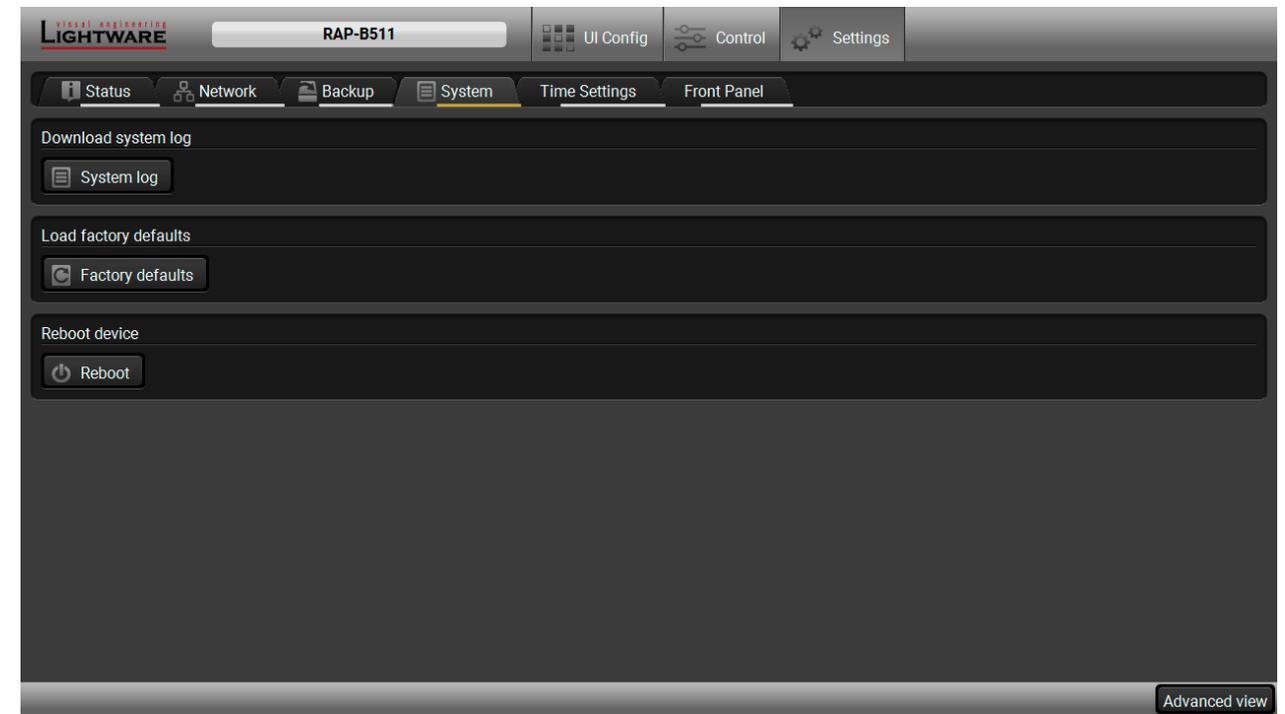
Slot ID	Configuration Name	Protection
Slot 1	meeting room 1.	Not protected
Slot 2	<Empty slot>	Not protected
Slot 3	<Empty slot>	Not protected
Slot 4	<Empty slot>	Not protected

Apply Save Save as protected Delete Upload Download

You can save presets as not protected using the **Save** button and as protected with using the **Save as protected** button. To restore a preset, select on the slot of the desired backup and click on the **Apply** button. You can save presets from a file from your local computer clicking on the **Upload** button and you can also save a preset from the device's memory to a backup file with using the **Download** button. If you do not need a saved preset any more, select it and click on the **Delete** button.

WARNING! Loading factory default settings will erase all presets which has been saved in the device memory!

5.8.5. System

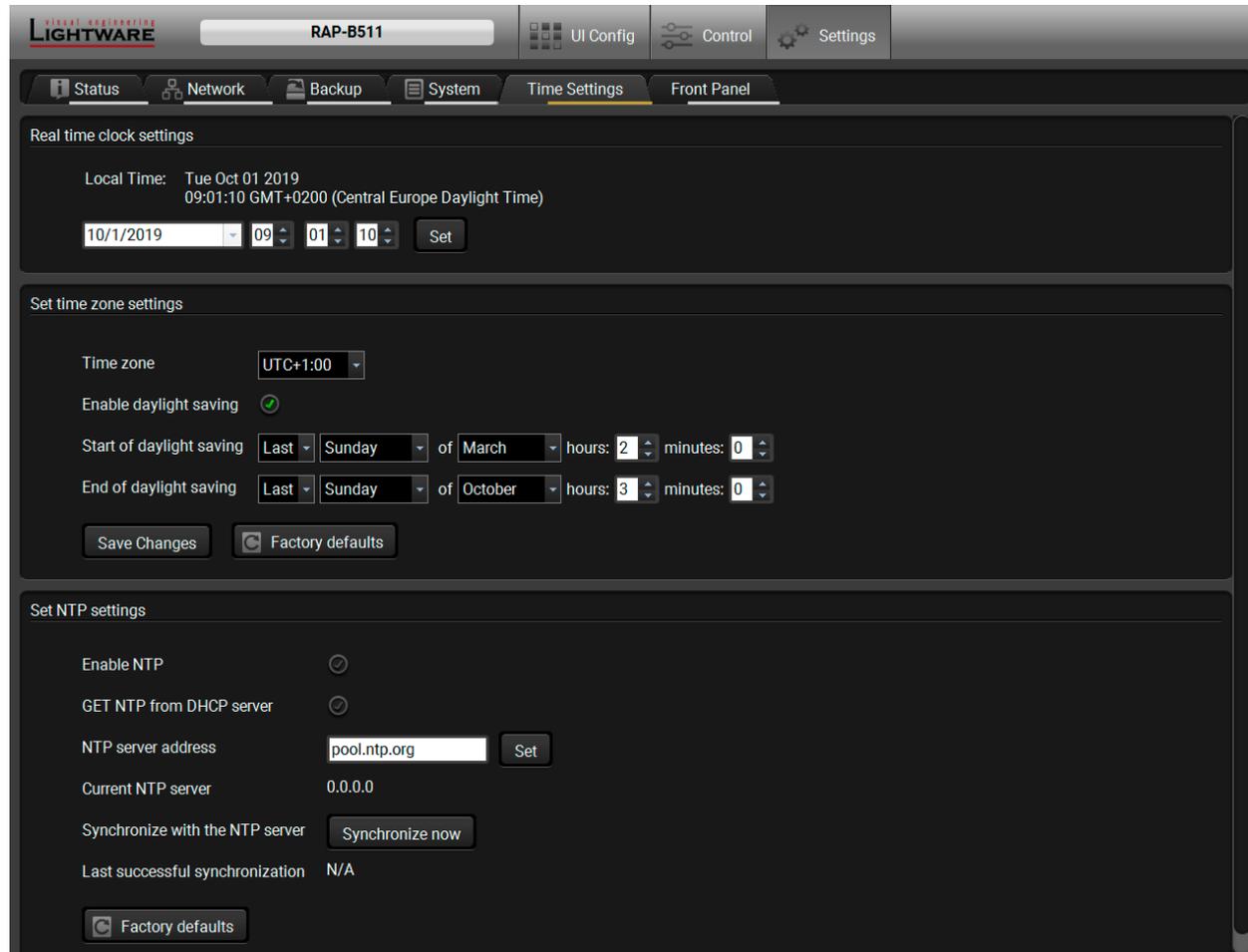


System tab in Settings menu

Three functions are available under System tab:

- **Download system log** - saving the file of the device.
- **Load factory defaults** - recalling factory defaults settings and values. All factory default settings are listed in the [Factory Default Settings](#) section.
- **Reboot** - rebooting the system.

5.9. Time Settings



Real-Time settings can be managed from **Time settings** tab. For more details about the dependency of the time properties, see the [Flowchart of the real-time clock configuration process](#).

Real time clock setting

In this section the current RTC (Real-time clock) time is displayed and can be modified manually. Click to **Set** button to save the new setting.

Set time zone setting

- **Time zone** can be selected from the drop-down menu.
- Check **Enable the daylight saving** if it is needed, and set the start and end date. These setting will added to the UTC (Universal Time Coordinated) and the NTP (Network Time Protocol) time.

INFO: If the RTC time is set manually, these settings will be ignored.

Set NTP (Network Time Protocol) settings

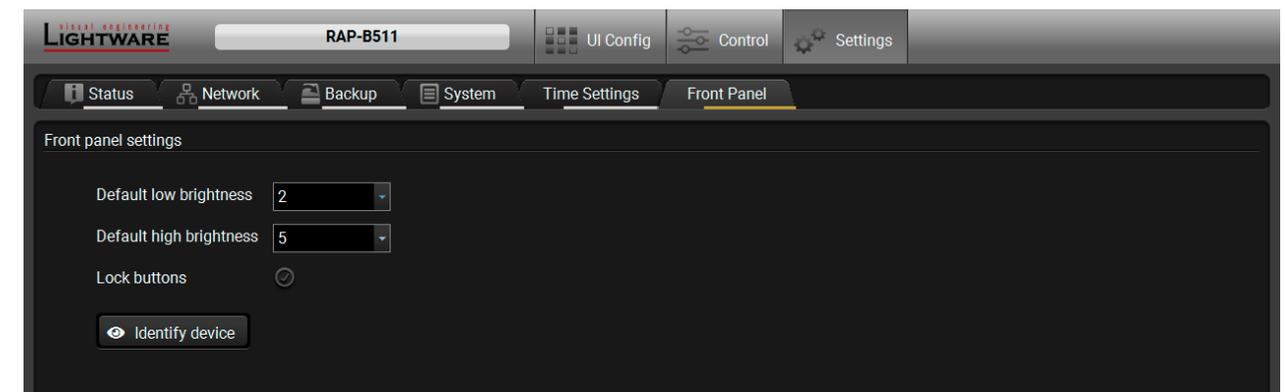
- **Enable NTP** makes it possible to query time information from an NTP server. It means, that the RAP-B511 is permitted to get time information from an NTP server. The device time synchronized repeatedly and automatically. In this case, the NTP server address entry field is active, where the IP address or URL of the NTP server can be typed manually. Click to set to save the address. The current setting is also displayed.
- Enable **GET NTP from DHCP server** means, when that DHCP server assigns an IP address to the RAP-B511, its own IP address or URL can be queried, and this address may be saved as an NTP server. In this case, the user does not have to give the IP address or URL manually.
- Clicking on the **Synchronize now** button queries the time information from the NTP server. Time is updated, when the device is restarted, powered off and on again and in certain time periods.

For more information about the time properties, the see the [Real-Time Clock](#) in the Device Concept chapter.

All settings are available with LW3 protocol commands, see the details in [Time Settings](#) section in LW3 programmers reference chapter.

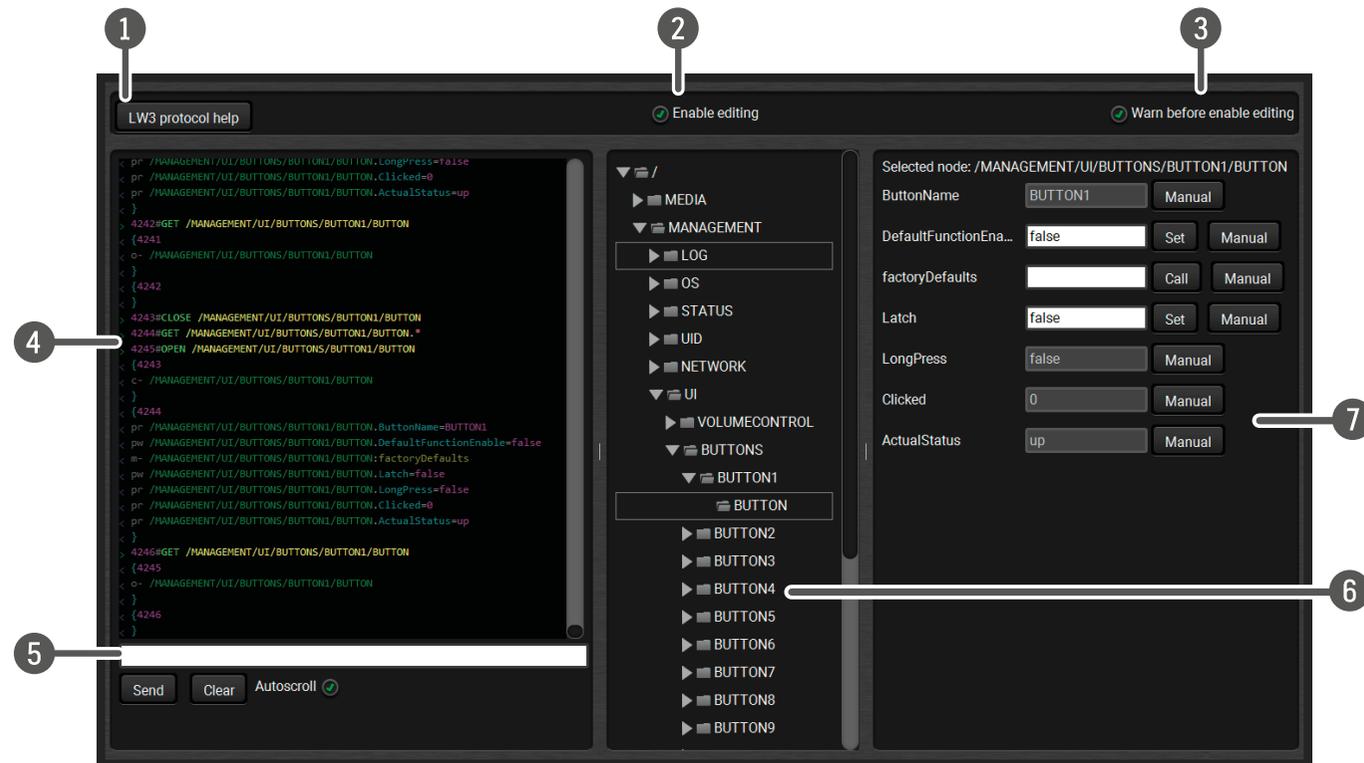
5.10. Front Panel Settings

The following settings are available on the Front Panel tab:



- **Default low brightness** and **default high brightness** intensity can be customized in 0-5 level scale where 0 means the no light, 5 means the maximum intensity.
The factory default value of the low brightness: 2
The factory default value of the high brightness: 5
- You can disable the functionality of the front panel buttons and the rotary knob with marking the **Lock buttons** option.
- Clicking on **Identify the device** button results the front panel LEDs blink for 10 seconds which helps to identify the device physically.

5.11. Advanced View Window



- 1 LW3 protocol help** Pushing the button results a help window opening which describes the most important information about LW3 protocol commands in HTML format.
- 2 Edit mode** The default appearance is the read-only mode. If you want to modify the values or parameters, tick the option. You will be prompted to confirm your selection.
- 3 Warning mode** If this is checked, a warning window pops up when you enable Edit mode.
- 4 Terminal window** Commands and responses with time and date are listed in this window. Sent command starts with '>' character, received response starts with '<' character. The color of each item depends on the type of the command and response. The content of the window can be emptied by the **Clear** button. If the **Autoscroll** option is ticked, the list is scrolled automatically when a new line is added.
- 5 Command line** Type the desired command and execute it by the **Send** button. Clear all current commands and responses in the Terminal window by the **Clear** button.
- 6 Protocol tree** LW3 protocol tree; select an item to see its content.
- 7 Node list** Correspondent parameters and nodes are shown which are connected to the selected item in the protocol tree.
 - Manual button:** Manual (short description) of the node can be called and displayed in the terminal window.
 - Set button:** Saves the value/parameter typed in the textbox.
 - Call button:** Calls the method, e.g. reloads factory default settings.

6

LW2 Programmer's Reference

The device can be controlled through a reduced command set of LW2 protocol commands to ensure the compatibility with other Lightware products. The supported LW2 commands are described in this chapter.

- ▶ [LW2 PROTOCOL DESCRIPTION](#)
- ▶ [GENERAL LW2 COMMANDS](#)
- ▶ [NETWORK CONFIGURATION](#)
- ▶ [GPIO CONFIGURATION](#)
- ▶ [LW2 COMMANDS – QUICK SUMMARY](#)

6.1. LW2 Protocol Description

The below listed commands can be sent to the device in RAW format via the TCP/IP port no. 10001.

The device accepts commands surrounded by curly brackets - {} - and responds data surrounded by round brackets - () - only if a command was successfully executed.

Format	Explanation
<in>	Input number in 1 or 2 digit ASCII format (01, 5, 07, 16, etc.)
<out>	Output number in 1 or 2 digit ASCII format
<in ² >	Input number in 2 digit ASCII format (01, 02, 10, 12 etc.)
<out ² >	Output number in 2 digit ASCII format (01, 02, 10, 12 etc.)
<loc>	Location number in 1, 2 or 3 digit ASCII format
<id>	id number in 1 or 2 digit ASCII format
<id ² >	id number in 2 digit ASCII format
CrLf	Carriage return, Line feed (0x0D, 0x0A)
•	Space character (0x20)
→	Each command issued by the controller
←	Each response received from the router

6.2. General LW2 Commands

6.2.1. View Product Type

Description: The device responds its label.

Format	Example
Command {i} Response (I:<PRODUCT_TYPE>)CrLf	→ {i} ← (I:RAP-B511-EU-K)

Explanation: The connected device is a RAP-B511-EU-K.

Legend: <PRODUCT_TYPE> shows type.

6.2.2. View Device Label

Description: The device responds its name.

Format	Example
Command {label} Response (LABEL=<DEVICE_LABEL>)CrLf	→ {label} ← (LABEL=RAP-B511)

Explanation: The connected device is a RAP-B511-EU-K.

Legend: <DEVICE_LABEL> shows the label.

6.2.3. Query Control Protocol

Description: The device can be controlled with different control protocols. This command queries the active protocol of the currently used control interface.

Format	Example
Command {P_?} Response (CURRENT●PROTOCOL●=●#<protocol>) CrLf	→ {P_?} ← (CURRENT PROTOCOL = #1)

Explanation: The device communicates with LW2 protocol.

6.2.4. View Firmware Version of the Package

Description: View the firmware package version.

Format	Example
Command {f} Response (FW:<FW_VER><s>)CrLf	→ {f} ← (FW:v1.0.4b1)

Legend: <FW_VER> is the firmware version. It is followed by <s> string which may indicate special versions.

6.2.5. View Firmware for All Controllers

Description: Shows the firmware versions of all installed controllers.

Format	Example
Command {FC} Response (CF●<DESC>)CrLf (CF END)CrLf	→ {fc} ← (CF RAP-B511-EU-K v1.0.4b1) ← (SL END)

6.2.6. Connection Test

Description: Simple test to see if the connection is established successfully.

Format	Example
Command {PING} Response (PONG!)CrLf	→ {ping} ← (PONG!)

6.2.7. View Serial Number

Description: The device responds its 8-digit serial number.

Format	Example
Command {s} Response (SN:<SERIAL_N>)CrLf	→ {s} ← (SN:12345678)

6.2.8. Compile Time

Description: Returns the date, when the microcontroller firmware was compiled.

Format	Example
Command {CT} Response (Complied: <DATE&TIME>)CrLf	→ {ct} ← (Complied: Jan 23 2019 12:58:38)

6.2.9. View Installed Board

Description: Shows the hardware name and revision of the installed card.

Format	Example
Command {is} Response (SL#●0●<MB_DESC>)CrLf (SL●END)CrLf	→ {is} ← (SL# 0 RAP-B511) ← (SL END)

Explanation: The device reports its motherboard (slot 0).

6.2.10. Restart the Device

Description: The device can be restarted without unplugging power.

Format	Example
Command {RST} Response	→ {rst}

Explanation: The device reboots; no response is sent in this case.

6.2.11. Query Health Status

Description: Internal voltages and measured temperature values are shown.

Format	Example
Command {ST} Response (ST●<DESC>)CrLf	→ {st} ← (ST CPU 3.00V 5.06V 1.81V 3.35V 50.20C 50.15C)

6.2.12. Restore Factory Default Settings

Description: Settings can be reset to factory default values as follows:

Format	Example
Command {FACTORY=ALL} Response (FACTORY ALL...)CrLf	→ {factory=all} ← (FACTORY ALL...)

Explanation: All settings and parameters are reset to factory default, see the table in the [Factory Default Settings](#) section.

6.3. Network Configuration

6.3.1. Query the Current IP Status

Description: IP address settings can be queried as follows.

Format	Example
Command {IP_STAT=?} Response (IP_STAT=<type>;<ip_address>; <subnet_mask>;<gateway_addr>)CrLf	→ {ip_stat=?} ← (IP_STAT=0;192.168.0.100; 255.255.255.0;192.168.0.1)

Legend:

<type>:	0 = static IP; 1 = DHCP.
<ip_addr>:	IP address (four decimal octets separated by dots).
<subnet_mask>:	Subnet mask (four decimal octets separated by dots).
<gateway_addr>:	Gateway address (four decimal octets separated by dots).

Explanation: The device has a static (fix) IP address: 192.168.0.100; the subnet mask is 255.255.255.0, the gateway address is 192.168.0.1.

6.3.2. Set the IP Address

Description: IP address can be set as follows.

Format	Example
Command {IP_ADDRESS=<type>;<ip_address>} Response (IP_ADDRESS=<type>;<ip_address>)CrLf	→ {ip_address=0;192.168.0.110} ← (IP_ADDRESS=0;192.168.0.110;)

Legend: <type>: 0 = static IP; 1 = DHCP

INFO: The IP address can be queried by typing the "ip_address=?" command. The response contains the fix IP address that is stored in the device even if DHCP is enabled; in this case, this IP address is not valid.

6.3.3. Set the Subnet Mask

Description: Subnet mask can be set as follows.

Format	Example
Command {IP_NETMASK=<subnet_mask>} Response (IP_NETMASK=<subnet_mask>)CrLf	→ {ip_netmask=255.255.255.0} ← (IP_NETMASK=255.255.255.0)

Legend: <subnet_mask>: Four decimal octets separated by dots.

INFO: The subnet mask can be queried by typing the "ip_address=?" command. The response contains the fix IP subnet mask that is stored in the device even if DHCP is enabled; in this case, this IP subnet mask is not valid.

6.3.4. Set the Gateway Address

Description: Gateway address can be set as follows.

Format	Example
Command {IP_GATEWAY=<gateway_addr>} Response (IP_GATEWAY=<gateway_addr>)CrLf	→ {ip_gateway=192.168.0.50} ← (IP_GATEWAY=192.168.0.50)

Legend: <gateway_addr>: Four decimal octets separated by dots.

INFO: The gateway address can be queried by typing the "ip_gateway=?" command. The response contains the static IP gateway address that is stored in the device even if DHCP is enabled. In that case, the latest valid gateway address (for static IP) is stored.

6.3.5. Apply Network Settings

Description: Apply the network settings and restart the network interface.

Format	Example
Command {ip_apply} Response (IP_APPLY)CrLf	→ {ip_apply} ← (IP_APPLY)

6.4. GPIO Configuration

6.4.1. Set Level and Direction for Each Pins

Description: GPIO pins can be configured as follows. See more details about GPIO connector in the section and about the interface in the section.

Format	Example
Command {GPIO<pin_nr>=<dir>;<level>} Response (GPIO<pin_nr>=<dir>;<level>)CrLf	→ {gpio1=0;H} ← (GPIO1=0;H)

Legend:

<pin_nr>:	GPIO pin number 1...3
<dir>:	The direction of the communication, it can be input or output.
<level>:	The level of the pin, it can be low or high.

Parameter <dir>	Description
I	Input
O	Output

Parameter <level>	Description
L	Low
H	High
T	Toggle

Explanation: GPIO pin 1 is set to output with high level.

INFO: The current GPIO pin configuration can be queried by typing the {GPIO<pin_nr>=?} command.

6.5. LW2 Commands – Quick Summary

General LW2 Commands

Operation	See in chapter	Command
View Product Type	6.2.1	{I}
View Device Label	6.2.2	{LABEL}
Query Control Protocol	6.2.3	{P_?}
View Firmware Version of the Package	6.2.4	{F}
View Firmware for All Controllers	6.2.5	{FC}
Connection Test	6.2.6	{PING}
View Serial Number	6.2.7	{S}
Compile Time	6.2.8	{CT}
View Installed Board	6.2.9	{IS}
Restart the Device	6.2.10	{RST}
Query Health Status	6.2.11	{ST}
Restore Factory Default Settings	6.2.12	{FACTORY=ALL}

Network Configuration

Operation	See in chapter	Command
Query the Current IP Status	6.3.1	{IP_STAT=?}
Set the IP Address	6.3.2	{IP_ADDRESS=<type>;IP_ADDRESS}
Set the Subnet Mask	6.3.3	{IP_NETMASK=<subnet_mask>}
Set the Gateway Address	6.3.4	{IP_GATEWAY=<gateway_address>}
Apply Network Settings	6.3.5	{IP_APPLY}

GPIO Configuration

Operation	See in chapter	Command
Set Level and Direction for Each Pins	6.4.1	{GPIO<pin_nr>=<dir>;<level>}

7

LW3 Programmers' Reference

The device can be controlled through Lightware 3 (LW3) protocol commands to ensure the compatibility with other Lightware products. The supported LW3 commands are described in this chapter.

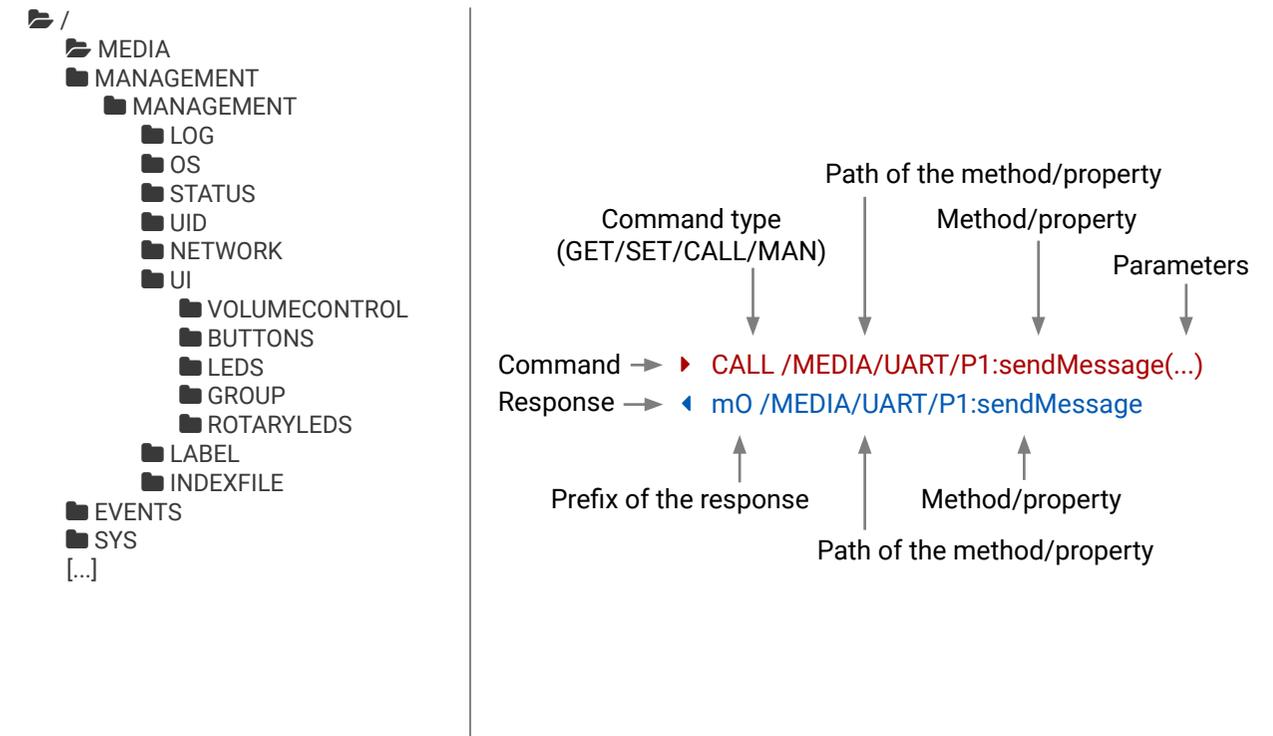
- ▶ [OVERVIEW](#)
- ▶ [PROTOCOL RULES](#)
- ▶ [SYSTEM COMMANDS](#)
- ▶ [TIME SETTINGS](#)
- ▶ [BUTTON CONFIGURATION](#)
- ▶ [BUTTON LED CONFIGURATION](#)
- ▶ [BUTTON GROUP CONFIGURATION](#)
- ▶ [VOLUME CONTROL CONFIGURATION](#)
- ▶ [NETWORK CONFIGURATION](#)
- ▶ [RS-232 PORT CONFIGURATION](#)
- ▶ [RS-232 RECOGNIZER](#)
- ▶ [INFRARED PORT CONFIGURATION](#)
- ▶ [GPIO PORT CONFIGURATION](#)
- ▶ [SENDING MESSAGE VIA THE COMMUNICATION PORTS](#)
- ▶ [LW3 QUICK SUMMARY](#)

7.1. Overview

The Lightware Protocol #3 (LW3) is implemented in almost all new Lightware devices (matrix switchers, signal extenders and distribution amplifiers) since 2012. The protocol is ASCII-based and all commands are terminated with a carriage return (Cr, '\r') and line feed (Lf, '\n') pair. It is organized as a tree structure that provides outstanding flexibility and user-friendly handling with 'nodes', 'properties' and 'methods'. The **Advanced View** of the Lightware Device Controller software is the perfect tool for browsing and learning how the LW3 protocol can be used in practice.

7.2. Protocol Rules

7.2.1. LW3 Tree Structure and Command Structure (examples)



7.2.2. General Rules

- All names and parameters are **case-sensitive**.
- The nodes are separated by a slash ('/') character.
- The node name can contain the elements of the English alphabet and numbers.
- Use the **TCP port no. 6107** when using LW3 protocol over Ethernet.
- When a command is issued by the device, the received response cannot be processed by the CPU.
- The node paths describe the exact location of the node, listing each parent node up to the root.

7.2.3. Command Types

GET command

The **GET** command can be used to get the child nodes, properties and methods of a specific node. It can also be used to get the value of a property. Use the dot character (.) when addressing a property:

- ▶ **GET /.SerialNumber**
- ◀ **pr /.SerialNumber=87654321**

GETALL command

The **GETALL** command can be used to get all child nodes, properties and methods of a node with one command.

- ▶ **GETALL /MEDIA/UART**
- ◀ **ns /MEDIA/UART/P1**
- ◀ **ns /MEDIA/UART/RECOGNIZER**
- ◀ **pr /MEDIA/UART.PortCount=1**
- ◀ **pr /MEDIA/UART.PortUi=P1:01209**
- ◀ **pr /MEDIA/UART.P1=Local RS-232**

SET command

The **SET** command can be used to modify the value of a property. Use the dot character (.) when addressing the property:

- ▶ **SET /MANAGEMENT/UI/BUTTONS/BUTTON1.Enabled=false**
- ◀ **pw /MANAGEMENT/UI/BUTTONS/BUTTON1.Enabled=false**

CALL command

A method can be invoked by the **CALL** command. Use the colon character (:) when addressing the method:

- ▶ **CALL /MANAGEMENT/UI/BUTTONS/BUTTON1:factoryDefaults()**
- ◀ **mO /MANAGEMENT/UI/BUTTONS/BUTTON1:factoryDefaults**

MAN command

The manual is a human readable text that describes the syntax and provides a hint for how to use the primitives. For every node, property and method in the tree there is a manual, type the MAN command to get the manual:

- ▶ **MAN /MANAGEMENT/UI/LEDS/LED1.TrueFunction**
- ◀ **pm /MANAGEMENT/UI/LEDS/LED1.TrueFunction [0-5] 0: off, 1: low, 2: high, 3: blink, 4: slow blink, 5: sine pulse**

7.2.4. Prefix Summary

DEFINITION: The prefix is a 2-character long code that describes the type of the response.

The following prefixes are defined in the LW3 protocol:

Prefix	Description	Prefix	Description
n-	a node	pm	a manual for the property
nE	an error for a node	m-	a method
nm	a manual for a node	mO	a response after a success method execution
pr	a read-only property	mF	a response after a failed method execution
pw	read-write property	mE	an error for a method
pE	an error for the property	mm	a manual for a method

7.2.5. Error Messages

There are several error messages defined in the LW3 protocol, all of them have a unique error number.

- ▶ **CALL /MEDIA/VIDEO/XP:switch(IA:01)**
- ◀ **nE /MEDIA/VIDEO/XP %E002:Not exists**

7.2.6. Escaping

DEFINITION: An escape sequence is a sequence of characters that does not represent itself when used inside a character or string literal, but is translated into another character or a sequence of characters.

Property values and method parameters can contain characters which are used as control characters in the protocol. They must be escaped. The escape character is the backslash ('\') and escaping means injecting a backslash before the character that should be escaped (like in C language).

Control characters are the following: \ { } # % () \r \n \t

The **original** message: **CALL /MEDIA/UART/P1:sendMessage(Set(01))**

The **escaped** message: **CALL /MEDIA/UART/P1:sendMessage(Set\01\)**

7.2.7. Signature

DEFINITION: The signature is a four-digit-long hexadecimal value that can be optionally placed before every command to keep a command and the corresponding responses together as a group.

Each line is terminated with a carriage return (Cr, '\r') and line feed (Lf, '\n') characters. In several cases the number of the lines in the response cannot be determined in advance, e.g. the client intends to receive for the whole response and also wants to be sure, that the received lines belong together and to the same command. In these cases, a special feature the 'signature' can be used. The response to that particular command will also be preceded by the signature, and the corresponding lines will be between brackets:

```
▶ GET /MEDIA/IR.*
◀ pr /MEDIA/IR.PortCount=1
◀ pr /MEDIA/IR.PortUi=S1:13313
◀ pr /MEDIA/IR.S1=IR in
```

INFO: The lines of the signature are also Cr and Lf terminated.

7.2.8. Subscription

DEFINITION: Subscription to a node means that the user will get a notification if a property of the node changes.

A user can subscribe to any node. These notifications are asynchronous messages and are useful to keep the client application up to date, without having to periodically poll the node to detect a changed property. When the user does not want to be informed about the changes anymore, he can simply unsubscribe from the node.

ATTENTION! The subscriptions are handled separately for connections. Hence, if the connection is terminated all registered subscriptions are deleted. After reopening a connection all subscribe commands have to be sent in order to get the notifications of the changes on that connection.

Subscribe to a Node

```
▶ OPEN /MEDIA/IR
◀ o- /MEDIA/IR
```

Get the Active Subscriptions

```
▶ OPEN
◀ os /MEDIA/IR/S1
◀ o- /MANAGEMENT/UI/BUTTONS/BUTTON1
◀ o- /MANAGEMENT/UI/LEDS/LED1
◀ o- /MANAGEMENT/UI/VOLUMECONTROL
◀ o- /MANAGEMENT/LABEL
```

Subscribe to Multiple Nodes

```
▶ OPEN /MEDIA/ETHERNET/*
◀ c- /MEDIA/ETHERNET/*
```

Unsubscribe from a Node

```
▶ CLOSE /MEDIA/ETHERNET
◀ c- /MEDIA/ETHERNET
```

Unsubscribe from Multiple Nodes

```
▶ CLOSE /MEDIA/ETHERNET/*
◀ c- /MEDIA/ETHERNET/*
```

7.2.9. Notifications about the Changes of the Properties

When the value of a property is changed and the user is subscribed to the node, which the property belongs to, an asynchronous notification is generated. This notification is called as the 'change message'. The format of such a message is very similar to the response for the **GET** command:

```
◀ CHG /EDID.EdidStatus=F48:E1
```

A Short Example of How to Use the Subscription

There are two independent users controlling the device through two independent connections (**Connection #1** and **Connection #2**). The events in the rows occur after each other.

```
▶ OPEN /MEDIA/VIDEO/QUALITY
◀ o- /MEDIA/VIDEO/QUALITY
▶ GET /MEDIA/VIDEO/Quality.QualityMode
◀ pm /MEDIA/VIDEO/QUALITY.QualityMode=graphic
▶ GET /MEDIA/VIDEO/Quality.QualityMode
◀ pm /MEDIA/VIDEO/QUALITY.QualityMode=graphic
▶ SET /MEDIA/VIDEO/Quality.QualityMode=video
◀ pw /MEDIA/VIDEO/QUALITY.QualityMode=video
◀ CHG /MEDIA/VIDEO/QUALITY.QualityMode=video
```

} Connection #1
} Connection #2
→ Connection #1

Explanation: The first user (**Connection #1**) set a subscription to a node. Later the other user (**Connection #2**) made a change, and thanks for the subscription, the first user got a notification about the change.

7.2.10. Legend for the Control Commands

Format	Description
<in>	Input port number
<out>	Output port number
<port>	Input or output port number
<loc>	Location number
<parameter>	Variable, which is defined and described in the command
<expression>	Batched parameters: the underline means that more expressions or parameters can be placed by using a semicolon, e.g. I2;I4;I5 or F27:E1;F47:E2
▶	Sent command
◀	Received response
.	Space character

7.3. System Commands

7.3.1. Query the Product Name

The name of the product is a read-only parameter and cannot be modified.

Command and Response

- ▶ GET·/.ProductName
- ◀ pr·/.ProductName=<product_name>

Example

- ▶ GET /.ProductName
- ◀ pr /.ProductName=RAP-B511-EU-K

7.3.2. Set the Device Label

ATTENTION! The device label can be changed to a custom text in the [Status](#) tab of the LDC software. This writable parameter is not the same as the ProductName parameter.

Command and Response

- ▶ SET·/MANAGEMENT/ LABEL.DeviceLabel=<custom_name>
- ◀ pw·/MANAGEMENT/LABEL.DeviceLabel=<custom_name>

The Device Label can be 31 character length and ASCII characters are allowed. Longer names are truncated.

Example

- ▶ SET /MANAGEMENT/LABEL.DeviceLabel=RAP-B511
- ◀ pw /MANAGEMENT/LABEL.DeviceLabel=RAP-B511

7.3.3. Query the Serial Number

Command and Response

- ▶ GET·/.SerialNumber
- ◀ pr·/.SerialNumber=<serial_nr>

Example

- ▶ GET /.SerialNumber
- ◀ pr /.SerialNumber=00009865

7.3.4. Query the Firmware Version

Command and Response

- ▶ GET·/SYS/MB.FirmwareVersion
- ◀ pr·/SYS/MB.FirmwareVersion=<firmware_version>

Example

- ▶ GET /SYS/MB.FirmwareVersion
- ◀ pr /SYS/MB.FirmwareVersion= v1.0.1b2

7.3.5. Resetting the Device

The device can be restarted – the current connections (LAN, RS-232 or USB) will be terminated.

Command and Response

- ▶ CALL·/SYS:reset()
- ◀ m0·/SYS:reset=

Example

- ▶ CALL /SYS:reset()
- ◀ m0 /SYS:reset=

7.3.6. Restore the Factory Default Settings

Command and Response

- ▶ CALL·/SYS:factoryDefaults()
- ◀ m0·/SYS:factoryDefaults=

Example

- ▶ CALL /SYS:factoryDefaults()
- ◀ m0 /SYS:factoryDefaults=

The device is restarted, current connections are terminated, and the default settings are restored. See the complete list in the [Factory Default Settings](#) section.

7.3.7. Enable PoE

Command and Response

- ▶ SET·/SYS/MB/POE.PoeEnabled=<PoE_status>
- ◀ pw·/SYS/MB/POE.PoeEnabled=<PoE_status>

Parameters

<PoE_status> **True:** PoE sending is enabled on P2 Ethernet port.
False: PoE sending is disabled on P2 Ethernet port.

Example

- ▶ SET /SYS/MB/POE.PoeEnabled=true
- ◀ pw /SYS/MB/POE.PoeEnabled=true

INFO: The RAP-B511 sends PoE when the connected device is also PoE-compatible.

7.4. Time Settings

7.4.1. Query the Timezone

Command and Response

- ▶ SET /SYS/MB/TIMEZONE.Timezone=<timezone>
- ◀ pw /SYS/MB/TIMEZONE.Timezone =<timezone>

Parameters

<timezone> Time zone setting in POSIX TZ format.

Example

- ▶ SET /SYS/MB/TIMEZONE.Timezone=CET-1CEST,M3.5.0/2,M10.5.0/3
- ◀ pw /SYS/MB/TIMEZONE.Timezone=CET-1CEST,M3.5.0/2,M10.5.0/3

TIPS AND TRICKS: Timezone and daylight saving settings can be done easily and quickly with Lightware Device Controller software in [Time Settings](#) section.

7.4.2. Enable Network Time Protocol (NTP)

Enabling Network Time Protocol means, that the RAP-B511 is permitted to get time information from an NTP server. The device time synchronized repeatedly and automatically.

Command and Response

- ▶ SET /SYS/MB/NTP.Enable=<enable_ntp>
- ◀ pw /SYS/MB/NTP.Enable=<enable_ntp>

Parameters

<enable_ntp> **true:** NTP enabled
false: NTP disabled

Example

- ▶ SET /SYS/MB/NTP.Enable=true
- ◀ pw /SYS/MB/NTP.Enable=true

7.4.3. Enable Getting NTP from DHCP server

When the DHCP server assigns an IP address to the device, there is an option to request an NTP time information. When the RAP-B511 connected to the internet, the NTP time is updated repeatedly.

Command and Response

- ▶ SET /SYS/MB/NTP.NtpServerFromDhcp=<enable_ntp_dhcp>
- ◀ pw /SYS/MB/NTP.NtpServerFromDhcp=<enable_ntp_dhcp>

Parameters

<enable_ntp_dhcp> **true:** Enable getting NTP from DHCP server
false: Disable getting NTP from DHCP server

Example

- ▶ SET /SYS/MB/NTP.NtpServerFromDhcp=true
- ◀ pw /SYS/MB/NTP.NtpServerFromDhcp=true

7.4.4. Query the Active NTP Server

Command and Response

- ▶ GET /SYS/MB/NTP.ActiveNtpServer
- ◀ pr /SYS/MB/NTP.ActiveNtpServer=<server_address>

Parameters

<server_address> NTP server address (IP address or URL)

Example

- ▶ GET /SYS/MB/NTP.ActiveNtpServer
- ◀ pr /SYS/MB/NTP.ActiveNtpServer=pool.ntp.org

7.4.5. Set NTP server

Command and Response

- ▶ SET /SYS/MB/NTP.NtpServer=<server_address>
- ◀ pw /SYS/MB/NTP.NtpServer=<server_address>

Parameters

<server_address> NTP server address (IP address or URL)

Example

- ▶ SET /SYS/MB/NTP.NtpServer=pool.ntp.org
- ◀ pw /SYS/MB/NTP.NtpServer=pool.ntp.org

7.4.6. Synchronize with the NTP server

Command and Response

- ▶ CALL /SYS/MB/NTP:updateTime()
- ◀ mO /SYS/MB/NTP:updateTime

Example

- ▶ CALL /SYS/MB/NTP:updateTime()
- ◀ mO /SYS/MB/NTP:updateTime

7.4.7. Query the Last Synchronization

Command and Response

- ▶ GET /SYS/MB/RTC.LastUpdate
- ◀ pr /SYS/MB/RTC.LastUpdate=<last_sync>

Parameters

<last_sync> Displays the last synchronization time.

Example

- ▶ GET /SYS/MB/RTC.LastUpdate
- ◀ pr /SYS/MB/RTC.LastUpdate=2019-04-30T16:36:41

7.4.8. Query the Universal Time Coordinated Time (UTC)

Command and Response

- ▶ GET /SYS/MB/RTC.UtcTime
- ◀ pr /SYS/MB/RTC.UtcTime=<utcTime>

Parameters

<utcTime> Displays the date and the UTC time.

Example

- ▶ GET /SYS/MB/RTC.UtcTime
- ◀ pr /SYS/MB/RTC.UtcTime=2019-05-16T10:41:38

7.4.9. Query the Local Time (RTC)

Command and Response

- ▶ GET /SYS/MB/RTC.LocalTime
- ◀ pr /SYS/MB/RTC.LocalTime=<localtime>

Parameters

<localtime> Displays the date and the local time.

Example

- ▶ GET /SYS/MB/RTC.LocalTime
- ◀ pr /SYS/MB/RTC.LocalTime=2019-02-14T17:16:14

7.4.10. Query the Local Time (RTC) Elements

TIPS AND TRICKS: When repetitive scheduled actions are required, these properties should be set as a condition in the Event Manager.

Command and Response

- ▶ GET /SYS/MB/RTC.<RTC_element>
- ◀ pr /SYS/MB/RTC.LocalTime=<RTC_element>

Parameters

Identifier	Parameter description	Parameter example
<RTC_element>	Years	2019 (four digit number between 2000 and 2099)
	Months	12 (max. two digit number between 1 and 12)
	Days	7 (max. two digit number between 1 and 31)
	Hours	9 (max. two digit number between 0 and 24)
	Minutes	54 (max. two digit number between 0 and 59)
	Seconds	11 (max. two digit number between 0 and 59)
	DaylightSaving	true or false
	Weekday	1: Monday; 2: Tuesday; 3: Wednesday; 4: Thursday 5: Friday; 6: Saturday; 7: Sunday It shows the which day is on the week.
	Yearday	193 (max. two digit number between 1 and 365) It shows the which day is in the year.
	Scheduler time	5-18-19 (Weekday-Hours-Minutes)

Example

- ▶ GET /SYS/MB/RTC.Years
- ◀ pr /SYS/MB/RTC.Years=2019

7.5. Button Configuration

General parameters

Identifier	Parameter description	Parameter values
<btn_ID>	Button identifier	BUTTON1-11

7.5.1. Lock the Front Panel Functionality

Command and Response

- ▶ SET /MANAGEMENT/UI.ControlLock=<lock_status>
- ◀ pw /MANAGEMENT/UI.ControlLock=<lock_status>

Parameters

<lock_status> **0:** None - All functions of the front panel buttons and the rotary are enabled.
1: Locked - Locking and unlocking of the front panel buttons and the rotary are possible with Lightware Device Controller software or via protocol command.

Example

- ▶ SET /MANAGEMENT/UI.ControlLock=1
- ◀ pw /MANAGEMENT/UI.ControlLock=1

7.5.2. Lock the Buttons Separately

Command and Response

- ▶ SET /MANAGEMENT/UI/BUTTONS/<btn_ID>.Enabled=<btn_lock_status>
- ◀ pw /MANAGEMENT/UI/BUTTONS/<btn_ID>.Enabled= <btn_lock_status>

Parameters

Identifier	Parameter description	Parameter values
<btn_lock_status>		true: On buttonpress event, the functionality of the button is enabled. false: On buttonpress event, the functionality of the button is disabled.

Example

- ▶ SET /MANAGEMENT/UI/BUTTONS/BUTTON1.Enabled=false
- ◀ pw /MANAGEMENT/UI/BUTTONS/BUTTON1.Enabled=false

7.5.3. Set the Button Operation Mode

Command and Response

- ▶ SET /MANAGEMENT/UI/BUTTONS/<btn_ID>.Mode=<btn_mode>
- ◀ pw /MANAGEMENT/UI/BUTTONS/<btn_ID>.Mode=<btn_mode>

Parameters

Identifier	Parameter description	Parameter values
<btn_mode>	Shows the button type. It can be momentary or toggle or radio .	<p>0: Momentary: Simple button function, when the button is pressed, the action will execute.</p> <ul style="list-style-type: none"> ▪ When the button is pressed, the <btn_ID>.State=true ▪ When the button is released, the <btn_ID>.State=false <p>1: Toggle: This button type toggles between two states (e.g. control turning on and off the light with one button).</p> <ul style="list-style-type: none"> ▪ When the button is pressed, the <btn_ID>.State changes. ▪ When the button is released, the <btn_ID>.State does not change. <p>2-6: Radio: It defines the assigned radio group of the button. One button can belong to one group at the same time.</p> <p>When the button is pressed, the <btn_ID>.State changes true and <btn_ID>.State of the other members in the same group changes false.</p> <p>2: Member of group 1; 3: Member of group 2; 4: Member of group 3; 5: Member of group 4; 6: Member of group 5.</p>

Example

- ▶ SET /MANAGEMENT/UI/BUTTONS/BUTTON1.Mode=1
- ◀ pw /MANAGEMENT/UI/BUTTONS/BUTTON1.Mode=1

7.5.4. Set the Button Interaction State

This property gives immediate feedback about the button status, which changes depending on the button mode. When the button function is configured with Lightware Device Controller Software, this parameter is set as a Condition in the Event Manager.

Command and Response

- ▶ SET /MANAGEMENT/UI/BUTTONS/<btn_ID>.State=<btn_state>
- ◀ pw /MANAGEMENT/UI/BUTTONS/<btn_ID>.State=<btn_state>

Parameters

Identifier	Parameter description	Parameter values
<btn_state>	Button state	true or false : It gives a feedback about the current state of the button, which changes depending on the Set the Button Operation Mode .

Example

- ▶ SET /MANAGEMENT/UI/BUTTONS/BUTTON1.State=true
- ▶ pw /MANAGEMENT/UI/BUTTONS/BUTTON1.State=true

7.5.5. Set the Button Name

Command and Response

- ▶ SET /MANAGEMENT/UI/BUTTONS/<btn_ID>.Name=<btn_name>
- ◀ pw /MANAGEMENT/UI/BUTTONS/<btn_ID>.Name=<btn_name>

Parameters

Identifier	Parameter description	Parameter values
<btn_name>	Button name	The button name can be 33 character-long, ASCII characters are allowed. Longer names are not accepted.

Example

- ▶ SET /MANAGEMENT/UI/BUTTONS/BUTTON1.Name=Projector on
- ▶ pw /MANAGEMENT/UI/BUTTONS/BUTTON1.Name=Projector on

7.5.6. Set the Icon for the Button

Command and Response

- ▶ SET /MANAGEMENT/UI/BUTTONS/<btn_ID>.IconId=<icon_ID>
- ◀ pw /MANAGEMENT/UI/BUTTONS/<btn_ID>.IconId=<icon_ID>

Parameters

Identifier	Parameter description	Parameter values
<icon_ID>	It defines the displayed icon of the button in the Miniweb or the LDC layout.	i1-i140 : Sets the pictogram on the button.

Button Icon and IDs													
0	1	2	3	4	5	6	7	8	9	10	11	APPLE TV	Apple TV
i1	i2	i3	i4	i5	i6	i7	i8	i9	i10	i11	i12	i13	i14
AUTO →	AUTO SOURCE	⊕	⊘	🔕	🔔	BLACK SCREEN	BLANK / AV MUTE	BLURAY	📺	⚡	CAMERA	📹	📺
i15	i16	i17	i18	i19	i20	i21	i22	i23	i24	i25	i26	i27	i28
📍	📺↓	📺↑	🕒	👤	DISPLAY 2	DISPLAY 1	DISPLAY OFF	📺	DISPLAY ON	📺	DISPLAY ON / OFF	📺	DOC CAM
i29	i30	i31	i32	i33	i34	i35	i36	i37	i38	i39	i40	i41	i42
DP	↑	↔	←	↓	HDMI	HDMI1	📺1	HDMI2	📺2	📺	📺	📺	🕒
i43	i44	i45	i46	i47	i48	i49	i50	i51	i52	i53	i54	i55	i56
🕒	INPUT1	→1	INPUT2	→2	INPUT3	→3	INPUT4	→4	LAPTOP	LAPTOP1	📺1	LAPTOP2	📺2
i57	i58	i59	i60	i61	i62	i63	i64	i65	i66	i67	i68	i69	i70
📺	LECTERN PC	💡 OFF	💡 ON	💡 ON / OFF	LIGHTS OFF	LIGHTS ON	LIGHTS ON / OFF	🔒	MEDIA PLAYER	📺	📺	📺	📺
i71	i72	i73	i74	i75	i76	i77	i78	i79	i80	i81	i82	i83	i84
🌙	📺	PC	PC1	📺1	PC2	📺2	📺	+	📺 OFF	📺 ON	📺 ON / OFF	PROJ OFF	PROJ ON
i85	i86	i87	i88	i89	i90	i91	i92	i93	i94	i95	i96	i97	i98
PROJ ON / OFF	📺	📺	ROOM PC	📺1	📺2	SCREEN DOWN	📺 OFF	📺 ON	📺 ON / OFF	SCREEN UP	SOURCE	★	
i99	i100	i101	i102	i103	i104	i105	i106	i107	i108	i109	i110	i111	i112
⚙️	SYSTEM OFF	📺 ON / OFF	SYSTEM ON	📺 ON	SYSTEM ON / OFF	📺 ON / OFF	📺	📺	📺	📺	📺	📺	📺
i113	i114	i115	i116	i117	i118	i119	i120	i121	i122	i123	i124	i125	i126
VGA	📺	VIDEO CONF	📺	📺	📺	📺	VOL DOWN	VOL MUTE	VOL UP	WALL PLATE	📺	📺	WIRELESS
i127	i128	i129	i130	i131	i132	i133	i134	i135	i136	i137	i138	i139	i140

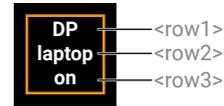
Example

- ▶ SET /MANAGEMENT/UI/BUTTONS/BUTTON2.IconId=i139
- ▶ pw /MANAGEMENT/UI/BUTTONS/BUTTON2.IconId=i139

7.5.7. Set the Label for the Button

Command and Response

- ▶ SET /MANAGEMENT/UI/BUTTONS/<btn_ID>. IconId=<row1>;<row2>;<row3>
- ◀ pw /MANAGEMENT/UI/BUTTONS/<btn_ID>. IconId=<row1>;<row2>;<row3>



Parameters

Identifier	Parameter description	Parameter values
<row1>;<row2>;<row3>	It defines the displayed text of the button in the Miniweb or the LDC layout.	Maximum three rows can be displayed for one button separated with semicolon. 30 ASCII characters are allowed for all rows.

Example

- ▶ SET /MANAGEMENT/UI/BUTTONS/BUTTON1.IconId=DP;laptop;on
- ▶ pw /MANAGEMENT/UI/BUTTONS/BUTTON1.IconId=DP;laptop;on

7.5.8. Clear the Button Style

The buttons style deleted when IconId has no parameter.

Command and Response

- ▶ SET /MANAGEMENT/UI/BUTTONS/<btn_ID>. IconId=
- ◀ pw /MANAGEMENT/UI/BUTTONS/<btn_ID>. IconId=

Example

- ▶ SET /MANAGEMENT/UI/BUTTONS/BUTTON1.IconId=
- ▶ pw /MANAGEMENT/UI/BUTTONS/BUTTON1.IconId=

7.5.9. Button Status Indicators

Query the Latch

Command and Response

- ▶ GET /MANAGEMENT/UI/BUTTONS/<btn_ID>/BUTTON.Latch
- ◀ pr /MANAGEMENT/UI/BUTTONS/<btn_ID>/BUTTON.Latch=<btn_latch_status>

Parameters

Identifier	Parameter description	Parameter values
<btn_latch_status>	When the button is pressed, the latch property toggles between true and false values every time. This property operates independently of the Set the Button Operation Mode .	True or False .

Example

- ▶ GET /MANAGEMENT/UI/BUTTONS/BUTTON1/BUTTON.Latch
- ◀ pw /MANAGEMENT/UI/BUTTONS/BUTTON1/BUTTON.Latch=false

Query the Actual Status

Command and Response

- ▶ GET /MANAGEMENT/UI/BUTTONS/<btn_ID>/BUTTON.ActualStatus
- ◀ pr /MANAGEMENT/UI/BUTTONS/<btn_ID>/BUTTON.ActualStatus=<btn_status>

Parameters

Identifier	Parameter description	Parameter values
<btn_status>	Shows if the button is pressed or not at the moment.	up : The button is not pressed at the moment. down : The button is pressed at the moment.

Example

- ▶ GET /MANAGEMENT/UI/BUTTONS/BUTTON1/BUTTON.ActualStatus
- ◀ pr /MANAGEMENT/UI/BUTTONS/BUTTON1/BUTTON.ActualStatus=up

Query the Clicked Status

Command and Response

- ▶ GET /MANAGEMENT/UI/BUTTONS/<btn_ID>/BUTTON.Clicked
- ◀ pr /MANAGEMENT/UI/BUTTONS/<btn_ID>/BUTTON.Clicked=<clicked_nr>

Parameters

Identifier	Parameter description
<clicked_nr>	Gives feedback about the number of the quick button presses (max. 1 sec between the presses). After the clicking, the value restores to default (0) immediately. It can be set as a condition in the Event Manager when the trigger should be e.g. a double click.

Example

- ▶ GET /MANAGEMENT/UI/BUTTONS/BUTTON1/BUTTON.Clicked
- ◀ pr /MANAGEMENT/UI/BUTTONS/BUTTON1/BUTTON.Clicked=0

Query the Longpress Status

Command and Response

- ▶ GET /MANAGEMENT/UI/BUTTONS/<btn_ID>/BUTTON.LongPress
- ◀ pr /MANAGEMENT/UI/BUTTONS/<btn_ID>/BUTTON.LongPress=<longpress_status>

Parameters

Identifier	Parameter description	Parameter values
<longpress_status>	True, when the button has been pressing more than 1 sec.	true : The button has been pressed more than 1 sec. false : The button has been pressed less than 1 sec.

Example

- ▶ GET /MANAGEMENT/UI/BUTTONS/BUTTON1/BUTTON.LongPress
- ◀ pr /MANAGEMENT/UI/BUTTONS/BUTTON1/BUTTON.LongPress=false

7.6. Button LED Configuration

General parameters

Identifier	Parameter description	Parameter values
<LED_ID>	LED identifier (LED1 is behind the BUTTON1)	LED1-11

7.6.1. Enable the Button LED

ATTENTION! If the Button LED is not enabled, the following LED-related settings will not be displayed.

Command and Response

- ▶ SET-/MANAGEMENT/UI/LEDS/<LED_ID>.Enabled=<LED_enable>
- ◀ pw-/MANAGEMENT/UI/LEDS/<LED_ID>.Enabled=<LED_enable>

Parameters

<LED_enable> **true:** The button LED is allowed to light.
false: The button LED is not allowed to light.

Example

- ▶ SET /MANAGEMENT/UI/LEDS/LED11.Enabled=true
- ◀ pw /MANAGEMENT/UI/LEDS/LED11.Enabled=true

7.6.2. Set the Default Intensity of the Low Brightness

Command and Response

- ▶ SET-/MANAGEMENT/UI/LEDS.LowBright=<light_intensity>
- ◀ pw-/MANAGEMENT/UI/LEDS.LowBright=<light_intensity>

Parameters

Identifier	Parameter description	Parameter values
<light_intensity>	The default intensity of the background light.	0-5:0 means no bright, 5 is the maximum brightness.

Example

- ▶ SET /MANAGEMENT/UI/LEDS.LowBright=1
- ◀ pw /MANAGEMENT/UI/LEDS.LowBright=1

7.6.3. Set the Default Intensity of the High Brightness

Command and Response

- ▶ SET-/MANAGEMENT/UI/LEDS.HighBright=<light_intensity>
- ◀ pw-/MANAGEMENT/UI/LEDS.HighBright=<light_intensity>

Parameters

Identifier	Parameter description	Parameter values
<light_intensity>	The default intensity of the background light.	0-5:0 means no bright, 5 is the maximum brightness.

Example

- ▶ SET /MANAGEMENT/UI/LEDS.HighBright=3
- ◀ pw /MANAGEMENT/UI/LEDS.HighBright=3

7.6.4. Set Background Light of the Button

Set the TrueFunction

Here the LEDs behaviour can be defined how the when the button is pressed or released. This property takes into consideration the [Set the Button Interaction State](#). If it is true (<btn_ID>.State=true), the LED will light according to this setting.

Command and Response

- ▶ SET-/MANAGEMENT/UI/LEDS/<LED_ID>.TrueFunction=<light_mode>
- ◀ pw-/MANAGEMENT/UI/LEDS/<LED_ID>.TrueFunction=<light_mode>

Parameters

Identifier	Parameter description	Parameter values
<light_mode>	Type of the background light.	0: Off 1: Low brightness 2: High brightness 3: Blinking 4: Slow blinking 5: Sine pulse

Example

- ▶ SET /MANAGEMENT/UI/LEDS/LED11.TrueFunction=1
- ◀ pw /MANAGEMENT/UI/LEDS/LED11.TrueFunction=1

Set the FalseFunction

Here the LEDs behaviour can be defined, when the button is pressed or released. This property takes into consideration the [Set the Button Interaction State](#). If it is false (<btn_ID>.State=false), the LED will light according to this setting.

Command and Response

- ▶ SET·/MANAGEMENT/UI/LEDS/<LED_ID>.FalseFunction=<light_mode>
- ◀ pw·/MANAGEMENT/UI/LEDS/<LED_ID>.FalseFunction=<light_mode>

Parameters

Identifier	Parameter description	Parameter values
<light_mode>	Type of the background light.	0: Off 1: Low brightness 2: High brightness 3: Blinking 4: Slow blinking 5: Sine pulse

Example

- ▶ SET /MANAGEMENT/UI/LEDS/LED11.FalseFunction=2
- ◀ pw /MANAGEMENT/UI/LEDS/LED11.FalseFunction=2

7.6.5. Set the Background Light for a Period of Time

Command and Response

- ▶ CALL·/MANAGEMENT/UI/LEDS/<led_ID>:<button_func>(<time>)
- ◀ mO·/MANAGEMENT/UI/LEDS/<led_ID>:<button_func>(<time>)

Parameters

Identifier	Parameter description	Parameter values
<led_ID>	LED identifier	LED1-11
<button_func>	Type of the background lightning.	tempFuncOff : No brightness tempFuncLowBright : Low brightness tempFuncHighBright : High brightness tempFuncBlink : Blinking
<time>	Duration of time in ms while the LED lights.	1-60000

Example

- ▶ CALL /MANAGEMENT/UI/LEDS/LED11:tempFuncOff(100)
- ◀ mO /MANAGEMENT/UI/LEDS/LED11:tempFuncOff

7.7. Button Group Configuration

7.7.1. Set the Buttons into Groups

The button mode defines which button belongs a certain group. For more information about it, see [Set the Button Operation Mode](#) section.

7.7.2. Query the Group Members

Command and Response

- ▶ GET·/MANAGEMENT/UI/GROUP/<group_ID>.GroupMembers
- ◀ pr·/MANAGEMENT/UI/GROUP/<group_ID>.GroupMembers=<member_list>

Parameters

Identifier	Parameter description	Parameter values
<group_ID>	Group identifier	G1-5
<member_list>	Shows which buttons belong to the group. The members are listed with their button ID numbers.	1-11;1-11;...1-11;

Example

- ▶ GET /MANAGEMENT/UI/GROUP/G1.GroupMembers
- ◀ pr /MANAGEMENT/UI/GROUP/G1.GroupMembers=1;2;3;

7.7.3. Set the Active Button

Command and Response

- ▶ SET·/MANAGEMENT/UI/GROUP/<group_ID>.Active=<btn_nr>
- ◀ pw·/MANAGEMENT/UI/GROUP/<group_ID>.Active=<btn_nr>

Parameters

Identifier	Parameter description	Parameter values
<group_ID>	Group identifier	G1-5
<btn_nr>	Shows which button is the active member of the group. It means, that the BUTTON<btn_nr>.State=true (and the State property of the other members in the group are false). For more information about the button states see Set the Button Interaction State section.	1-11

Example

- ▶ SET /MANAGEMENT/UI/GROUP/G1.Active=1
- ◀ pw /MANAGEMENT/UI/GROUP/G1.Active=1

7.8. Volume Control Configuration

7.8.1. Control Lock of the Jog Dial

This property can disable the control function of the jog dial without locking the buttons.

Command and Response

- ▶ SET-/MANAGEMENT/UI/VOLUMECONTROL.Enabled=<enabled>
- ◀ pw-/MANAGEMENT/UI/VOLUMECONTROL.Enabled=<enabled>

Parameters

<enabled> **true:** Jog dial control is enabled.
false: Operation of the jog dial is disabled. The mute LED and Rotary LEDs and are turned down. When the rotary is turned, VOLUMECONTROL.Volume will not change, and the rotary is pressed, the VOLUMECONTROL.Mute property will not toggle.

Example

- ▶ SET /MANAGEMENT/UI/VOLUMECONTROL.Enabled=true
- ◀ pw /MANAGEMENT/UI/VOLUMECONTROL.Enabled=true

ATTENTION! When the rotary is disabled, the [Query the Rotating Direction of the Jog Dial](#), [Query the Actual Status of the Rotary](#), [Query the Longpress Status](#), [Query the Clicked Status](#) will change.

7.8.2. Set the Volume

Rotating the jog dial changes the volume property value (and turns on and off the volume indicator LEDs) between 0 and 16.

Command and Response

- ▶ SET-/MANAGEMENT/UI/VOLUMECONTROL.Volume=<volume_value>
- ◀ pw-/MANAGEMENT/UI/VOLUMECONTROL.Volume=<volume_value>

Parameters

<volume_value> **0-16:** Volume level can be set between 0 and 16.

Example

- ▶ SET /MANAGEMENT/UI/VOLUMECONTROL.Volume=5
- ◀ pw /MANAGEMENT/UI/VOLUMECONTROL.Volume=5

7.8.3. Mute the Volume

Clicking on the jog dial changes the mute state (and toggles on and off the mute LED).

Command and Response

- ▶ SET-/MANAGEMENT/UI/VOLUMECONTROL.Mute=<mute_state>
- ◀ pw-/MANAGEMENT/UI/VOLUMECONTROL.Mute=<mute_state>

Parameters

<mute_state> **true or false**

Example

- ▶ SET /MANAGEMENT/UI/VOLUMECONTROL.Mute=false
- ◀ pw /MANAGEMENT/UI/VOLUMECONTROL.Mute=false

7.8.4. Volume Control (Jog Dial) Status Indicators

These properties gives immediate feedback about the jog dial status. They are for using as a Condition in the Event Manager.

Query the Rotating Direction of the Jog Dial

Command and Response

- ▶ GET-/MANAGEMENT/UI/VOLUMECONTROL/ROTARY.RotaryPosition
- ◀ pw-/MANAGEMENT/UI/VOLUMECONTROL/ROTARY.RotaryPosition=<direction>

Parameters

<direction> **1:** Jog dial is rotating clockwise.
-1: Jog dial is rotating counter clockwise
0: Default value, when the rotary does not turn.

Example

- ▶ GET /MANAGEMENT/UI/VOLUMECONTROL/ROTARY.RotaryPosition
- ◀ pr /MANAGEMENT/UI/VOLUMECONTROL/ROTARY.RotaryPosition=-1

Query the Actual Status of the Rotary

Command and Response

- ▶ GET·/MANAGEMENT/UI/VOLUMECONTROL/ROTARY.ActualStatus
- ◀ pr·/MANAGEMENT/UI/VOLUMECONTROL/ROTARY.ActualStatus=<rotary_status>

Parameters

Identifier	Parameter description	Parameter values
<rotary_status>	Shows if the rotary button is pressed or not at the moment.	up : The rotary button is not pressed at the moment. down : The rotary button is pressed at the moment.

Example

- ▶ GET /MANAGEMENT/UI/VOLUMECONTROL/ROTARY.ActualStatus
- ◀ pr /MANAGEMENT/UI/VOLUMECONTROL/ROTARY.ActualStatus=up

Query the Longpress Status

Command and Response

- ▶ GET·/MANAGEMENT/UI/VOLUMECONTROL/ROTARY.LongPress
- ◀ pr·/MANAGEMENT/UI/VOLUMECONTROL/ROTARY.LongPress=<longpress_status>

Parameters

Identifier	Parameter description	Parameter values
<longpress_status>	True, when the rotary button has been pressing more than 1 sec.	true : The rotary button has been pressed more than 1 sec. false : The rotary button has been pressed less than 1 sec.

Example

- ▶ GET /MANAGEMENT/UI/VOLUMECONTROL/ROTARY.LongPress
- ◀ pr /MANAGEMENT/UI/VOLUMECONTROL/ROTARY.LongPress=false

Query the Clicked Status

Command and Response

- ▶ GET·/MANAGEMENT/UI/VOLUMECONTROL/ROTARY.Clicked
- ◀ pr·/MANAGEMENT/UI/VOLUMECONTROL/ROTARY.Clicked=<clicked_nr>

Parameters

<clicked_nr> Gives feedback about the number of the quick button presses (max. 1 sec between the presses).

Example

- ▶ GET /MANAGEMENT/UI/VOLUMECONTROL/ROTARY.Clicked
- ◀ pr /MANAGEMENT/UI/VOLUMECONTROL/ROTARY.Clicked=0

7.9. Network Configuration

7.9.1. Query the DHCP State

Command and Response

- ▶ GET /MANAGEMENT/NETWORK.DhcpEnabled
- ◀ pw /MANAGEMENT/NETWORK.DhcpEnabled=false

Parameters

<DHCP_state> **true**: DHCP is enabled
false: DHCP is disabled

Example

- ▶ GET /MANAGEMENT/NETWORK.DhcpEnabled
- ◀ pw /MANAGEMENT/NETWORK.DhcpEnabled=true

7.9.2. Change the DHCP State

Command and Response

- ▶ SET /MANAGEMENT/NETWORK.DhcpEnabled=<DHCP_state>
- ◀ pw /MANAGEMENT/NETWORK.DhcpEnabled=<DHCP_state>

Parameters

<DHCP_state> **true**: DHCP is enabled
false: DHCP is disabled

Example

- ▶ SET /MANAGEMENT/NETWORK.DhcpEnabled=false
- ◀ pw /MANAGEMENT/NETWORK.DhcpEnabled=false

7.9.3. Query the IP Address

Command and Response

- ▶ GET /MANAGEMENT/NETWORK.IpAddress
- ◀ pr /MANAGEMENT/NETWORK.IpAddress=<IP_address>

Example

- ▶ GET /MANAGEMENT/NETWORK.IpAddress
- ◀ pr /MANAGEMENT/NETWORK.IpAddress=192.168.0.100

7.9.4. Change the IP Address (Static)

Command and Response

- ▶ SET /MANAGEMENT/NETWORK.StaticIpAddress=<IP_address>
- ◀ pw /MANAGEMENT/NETWORK.StaticIpAddress=<IP_address>

Example

- ▶ SET /MANAGEMENT/NETWORK.StaticIpAddress=192.168.0.85
- ◀ pw /MANAGEMENT/NETWORK.StaticIpAddress=192.168.0.85

7.9.5. Query the Subnet Mask

Command and Response

- ▶ GET /MANAGEMENT/NETWORK.NetworkMask
- ◀ pr /MANAGEMENT/NETWORK.NetworkMask=<netmask>

Example

- ▶ GET /MANAGEMENT/NETWORK.NetworkMask
- ◀ pr /MANAGEMENT/NETWORK.NetworkMask=255.255.255.0

7.9.6. Change the Subnet Mask (Static)

Command and Response

- ▶ SET /MANAGEMENT/NETWORK.StaticNetworkMask=<netmask>
- ◀ pw /MANAGEMENT/NETWORK.StaticNetworkMask=<netmask>

Example

- ▶ SET /MANAGEMENT/NETWORK.StaticNetworkMask=255.255.255.0
- ◀ pw /MANAGEMENT/NETWORK.StaticNetworkMask=255.255.255.0

7.9.7. Query the Gateway Address

Command and Response

- ▶ GET /MANAGEMENT/NETWORK.GatewayAddress
- ◀ pr /MANAGEMENT/NETWORK.GatewayAddress=<gw_address>

Example

- ▶ GET /MANAGEMENT/NETWORK.GatewayAddress
- ◀ pr /MANAGEMENT/NETWORK.GatewayAddress=192.168.0.1

7.9.8. Change the Gateway Address (Static)

Command and Response

- ▶ SET /MANAGEMENT/NETWORK.StaticGatewayAddress=<gw_add>
- ◀ pw /MANAGEMENT/NETWORK.StaticGatewayAddress=<gw_add>

Example

- ▶ SET /MANAGEMENT/NETWORK.StaticGatewayAddress=192.168.0.5
- ◀ pw /MANAGEMENT/NETWORK.StaticGatewayAddress=192.168.0.5

7.9.9. Apply Network Settings

Always call the **Apply settings** function to save the network settings.

Command and Response

- ▶ CALL /MANAGEMENT/NETWORK:ApplySettings()
- ◀ mO /MANAGEMENT/NETWORK:ApplySettings

Example

- ▶ CALL /MANAGEMENT/NETWORK:ApplySettings()
- ◀ mO /MANAGEMENT/NETWORK:ApplySettings

7.10. RS-232 Port Configuration

7.10.1. Protocol Setting

Command and Response

- ▶ SET /MEDIA/UART/P1.ControlProtocol=<cont_protocol>
- ◀ pw /MEDIA/UART/P1.ControlProtocol=<cont_protocol>

Parameters

Identifier	Parameter description	Parameter values
<cont_protocol>	Selected protocol	0: LW2 1: LW3

Example

- ▶ SET /MEDIA/UART/P1.ControlProtocol=1
- ◀ pw /MEDIA/UART/P1.ControlProtocol=1

7.10.2. BAUD Rate Setting

Command and Response

- ▶ SET /MEDIA/UART/P1.Baudrate=<baud_rate>
- ◀ pw /MEDIA/UART/P1.Baudrate=<baud_rate>

Parameters

Identifier	Parameter description	Parameter values
<baud_rate>	Baud rate	0: 4800; 1: 7200; 2: 9600 3: 14400; 4: 19200; 5: 38400 6: 57600; 7: 115200

Example

- ▶ SET /MEDIA/UART/P1.Baudrate=2
- ◀ pw /MEDIA/UART/P1.Baudrate=2

7.10.3. Databit Setting

Command and Response

- ▶ SET /MEDIA/UART/P1.DataBits=<databit>
- ◀ pw /MEDIA/UART/P1.DataBits=<databit>

Parameters

Identifier	Parameter description	Parameter values
<databit>	Databit	8: 8 9: 9

Example

- ▶ SET /MEDIA/UART/P1.DataBits=8
- ◀ pw /MEDIA/UART/P1.DataBits=8

7.10.4. Stopbits Setting

Command and Response

- ▶ SET /MEDIA/UART/P1.StopBits=<stopbit>
- ◀ pw /MEDIA/UART/P1.StopBits=<stopbit>

Parameters

Identifier	Parameter description	Parameter values
<stopbit>	Stopbit	0: 1 1: 1,5 2: 2

Example

- ▶ SET /MEDIA/UART/P1.StopBits=0
- ◀ pw /MEDIA/UART/P1.StopBits=0

7.10.5. Parity Setting

Command and Response

- ▶ SET /MEDIA/UART/P1.Parity=<parity>
- ◀ pw /MEDIA/UART/P1.Parity=<parity>

Parameters

Identifier	Parameter description	Parameter values
<parity>	Parity	0: no parity 1: odd 2: even

Parameters

<recognized_hex> Recognized data in hex format.

Example

- ▶ GET /MEDIA/UART/RECOGNIZER.RxHex
- ◀ pr /MEDIA/UART/RECOGNIZER.RxHex=FF1F4C6F67696E3A

Recognized data hash

- ▶ GET /MEDIA/UART/RECOGNIZER.Hash
- ◀ pr /MEDIA/UART/RECOGNIZER.Hash=<recognized_hash>

Parameters

<recognized_hash> Fingerprint code, Max. 32 bit-long recognized data hash.

Example

- ▶ GET /MEDIA/UART/RECOGNIZER.Hash
- ◀ pr /MEDIA/UART/RECOGNIZER.Hash=997A659E

7.11.5. Clear the Stored Last Recognized Serial Message

This method deletes all the stored received serial messages.

- ▶ CALL /MEDIA/UART/RECOGNIZER:clear()
- ◀ mO /MEDIA/UART/RECOGNIZER:clear

Example

- ▶ CALL /MEDIA/UART/RECOGNIZER:clear()
- ◀ mO /MEDIA/UART/RECOGNIZER:clear

7.11.6. Query the Last Recognized Serial Message (ActiveRx, ActiveRxHex, ActiveHash)

The recognized data is stored in string, hex and hash format in a temporary storage. They are erased when the Active Timeout elapsed.

TIPS AND TRICKS: When these properties are set as a condition in the Event Manager, and the same strings follow each other, the action **will be executed every time** if the active timeout has been set properly.

Recognized data in string format

- ▶ GET /MEDIA/UART/RECOGNIZER.ActiveRx
- ◀ pr /MEDIA/UART/RECOGNIZER.ActiveRx=<recognized_string>

Parameters

<recognized_string> Max. 12 byte-long recognized data string.

Example

- ▶ GET /MEDIA/UART/RECOGNIZER.ActiveRx
- ◀ pr /MEDIA/UART/RECOGNIZER.ActiveRx>Login:

Recognized data in hex format

- ▶ GET /MEDIA/UART/RECOGNIZER.ActiveRxHex
- ◀ pr /MEDIA/UART/RECOGNIZER.ActiveRxHex=<recognized_hex>

Parameters

<recognized_hex> Recognized data in hex format.

Example

- ▶ GET /MEDIA/UART/RECOGNIZER.ActiveRxHex
- ◀ pr /MEDIA/UART/RECOGNIZER.ActiveRxHex= 4C6F67696E3A

Recognized data hash

- ▶ GET /MEDIA/UART/RECOGNIZER.ActiveHash
- ◀ pr /MEDIA/UART/RECOGNIZER.ActiveHash=<recognized_hash>

Parameters

<recognized_hash> Fingerprint code, Max. 32 bit-long recognized data hash.

Example

- ▶ GET /MEDIA/UART/RECOGNIZER.ActiveHash
- ◀ pr /MEDIA/UART/RECOGNIZER.ActiveHash= 2D8A5E38

7.11.7. Set the Active Timeout

This property is responsible for erasing the temporary storage (ActiveRx, ActiveRxHex, ActiveHash) after the elapsing time. Default value is 50ms.

- ▶ SET /MEDIA/UART/RECOGNIZER.ActivePropertyTimeout=<a_timeout>
- ◀ pw /MEDIA/UART/RECOGNIZER.ActivePropertyTimeout=<a_timeout>

Parameters

<a_timeout> active timeout value (ms) between 0 and 255.

Example

- ▶ SET /MEDIA/UART/RECOGNIZER.ActivePropertyTimeout=255
- ◀ pw /MEDIA/UART/RECOGNIZER.ActivePropertyTimeout=255

7.12. Infrared Port Configuration**Enable Command Injection Mode****Command and Response**

- ▶ SET /MEDIA/IR/S1.CommandInjectionEnable=<ci_status>
- ◀ pw /MEDIA/IR/S1.CommandInjectionEnable=<ci_status>

Parameters

Identifier	Parameter description	Parameter values
<ci_status>	IR port status	true: Enable false: Disable

Example

- ▶ SET /MEDIA/IR/S1.CommandInjectionEnable=true
- ◀ pw /MEDIA/IR/S1.CommandInjectionEnable=true

7.13. GPIO Port Configuration

7.13.1. Set the Direction of a GPIO Pin

Command and Response

- ▶ SET /MEDIA/GPIO/<gpio_port>.Direction=<dir>
- ◀ pw /MEDIA/GPIO/<gpio_port>.Direction=<dir>

Parameters

- <dir> I: input direction of the GPIO pin
O: output direction of the GPIO pin

Example

- ▶ SET /MEDIA/GPIO/P1.Direction=I
- ◀ pw /MEDIA/GPIO/P1.Direction=I

7.13.2. Set the Output Level of a GPIO Pin

Command and Response

- ▶ SET /MEDIA/GPIO/<gpio_port>.Output=<value>
- ◀ pw /MEDIA/GPIO/<gpio_port>.Output=<value>

Parameters

Identifier	Parameter description	Parameter values
<gpio_port>	GPIO port number	P1-P3
<value>	Value of the GPIO pin	H: High level L: Low level

Example

- ▶ SET /MEDIA/GPIO/P1.Output=H
- ◀ pw /MEDIA/GPIO/P1.Output=H

7.13.3. Toggle the Level of a GPIO Pin

It toggles between the high and low level of the chosen output port.

Command and Response

- ▶ CALL /MEDIA/GPIO/<gpio_port>:toggle()
- ◀ pw /MEDIA/GPIO/ <gpio_port>:toggle

Example

- ▶ CALL /MEDIA/GPIO/P1:toggle()
- ◀ mO /MEDIA/GPIO/P1:toggle

7.14. Sending Message via the Communication Ports

7.14.1. Sending Message via TCP Port

The device can be used for sending a message to a certain IP:port address. The three different commands allow controlling the connected (third-party) devices.

7.14.1.1. Sending a TCP Message (ASCII-format)

The command is for sending a command message in ASCII-format. This method allows escaping the control characters. For more information see the [Escaping](#) section.

Command and Response

- ▶ CALL /MEDIA/ETHERNET:tcpMessage(<IP_address>:<port_no>=<message>)
- ◀ mO /MEDIA/ETHERNET:tcpMessage

Example

- ▶ CALL /MEDIA/ETHERNET:tcpMessage(192.168.0.103:6107=C00)
- ◀ mO /MEDIA/ETHERNET:tcpMessage

The 'C00' message is sent to the indicated IP:port address.

Example with HEX codes

- ▶ CALL /MEDIA/ETHERNET:tcpMessage(192.168.0.20:5555=C00\x0a\x0d)
- ◀ mO /MEDIA/ETHERNET:tcpMessage

The 'C00' message with CrLf (Carriage return and Line feed) is sent to the indicated IP:port address. The \x sequence indicates the HEXA code; see more information in the [Using Hexadecimal Codes](#) section.

7.14.1.2. Sending a TCP Text (ASCII-format)

The command is for sending a text message in ASCII-format. This method **does not allow** escaping or inserting control characters.

Command and Response

- ▶ CALL /MEDIA/ETHERNET:tcpText(<IP_address>:<port_no>=<text>)
- ◀ mO /MEDIA/ETHERNET:tcpText

Example

- ▶ CALL /MEDIA/ETHERNET:tcpText(192.168.0.103:6107=pwr_on)
- ◀ mO /MEDIA/ETHERNET:tcpText

The 'pwr_on' text is sent to the indicated IP:port address.

7.14.1.3. Sending a TCP Binary Message (HEX-format)

The command is for sending a binary message in Hexadecimal format. This method **does not allow** escaping or inserting control characters.

Command and Response

- ▶ CALL /MEDIA/ETHERNET:tcpBinary(<IP_address>:<port_no>=<HEX_message>)
- ◀ mO /MEDIA/ETHERNET:tcpBinary

Example

- ▶ CALL /MEDIA/ETHERNET:tcpBinary(192.168.0.103:6107=0100000061620000cdcc2c40)
- ◀ mO /MEDIA/ETHERNET:tcpBinary

The '0100000061620000cdcc2c40' message is sent to the indicated IP:port address.

INFO: There is no need to insert a space or other separator character between the binary messages.

7.14.2. UDP Message Sending via Ethernet

The device can be used for sending a message to a certain IP:port address. The three different commands allow controlling the connected (third-party) devices.

7.14.2.1. Sending UDP Message (ASCII-format)

The command is for sending a UDP message in ASCII-format. This method allows escaping the control characters. For more information see the [Escaping](#) section.

Command and Response

- ▶ CALL /MEDIA/ETHERNET:udpMessage(<IP_address>:<port_no>=<message>)
- ◀ mO /MEDIA/ETHERNET:udpMessage

Example

- ▶ CALL /MEDIA/ETHERNET:udpMessage(192.168.0.103:6107=C00)
- ◀ mO /MEDIA/ETHERNET:udpMessage

The 'C00' message is sent to the indicated IP:port address.

Example with HEX codes

- ▶ CALL /MEDIA/ETHERNET:udpMessage(192.168.0.20:9988=C00\x0a\x0d)
- ◀ mO /MEDIA/ETHERNET:udpMessage

The 'C00' message with CrLf (Carriage return and Line feed) is sent to the indicated IP:port address. The \x sequence indicates the HEXA code; see more information in the [Using Hexadecimal Codes](#) section.

7.14.2.2. Sending a UDP Text (ASCII-format)

The command is for sending a text message in ASCII-format via UDP-protocol. This method **does not allow** escaping or inserting control characters.

Command and Response

- ▶ CALL /MEDIA/ETHERNET:udpText(<IP_address>:<port_no>=<text>)
- ◀ mO /MEDIA/ETHERNET:udpText

Example

- ▶ CALL /MEDIA/ETHERNET:udpText(192.168.0.20:9988=open)
- ◀ mO /MEDIA/ETHERNET:udpText

The 'open' text is sent to the indicated IP:port address.

7.14.2.3. Sending a UDP Binary Message (HEX-format)

The command is for sending a binary message in Hexadecimal format via UDP protocol. This method **does not allow** escaping or inserting control characters.

Command and Response

- ▶ CALL /MEDIA/ETHERNET:udpBinary(<IP_address>:<port_no>=<HEX_message>)
- ◀ mO /MEDIA/ETHERNET:udpBinary

Example

- ▶ CALL /MEDIA/ETHERNET:udpBinary(192.168.0.20:9988=433030)
- ◀ mO /MEDIA/ETHERNET:udpBinary

The '433030' message is sent to the indicated IP:port address.

INFO: There is no need to insert a space or other separator character between the binary messages.

7.14.3. Message Sending via RS-232 Serial Port

7.14.3.1. Sending a Message (ASCII-format) via RS-232

The command is for sending a command message in ASCII-format. This method **allows** escaping the control characters. For more information see the [Escaping](#) section.

Command and Response

- ▶ CALL /MEDIA/UART/P1:sendMessage(<message>)
- ◀ mO /MEDIA/UART/P1:sendMessage

Example

- ▶ CALL /MEDIA/UART/P1:sendMessage(PWR0)
- ◀ mO /MEDIA/UART/P1:sendMessage

The 'PWR0' message is sent out via the P1 serial port.

7.14.3.2. Sending a Text (ASCII-format) via RS-232

The command is for sending a command message in ASCII-format. This method **does not allow** escaping the control characters.

Command and Response

- ▶ CALL /MEDIA/UART/P1:sendText(<message>)
- ◀ mO /MEDIA/UART/P1:sendText

Example

- ▶ CALL /MEDIA/UART/P1:sendText(open)
- ◀ mO /MEDIA/UART/P1:sendText

The 'open' text is sent out via the P1 serial port.

7.14.3.3. Sending a Binary Message (HEX-format) via RS-232

The command is for sending a command message in Hexadecimal-format. This method **does not allow** escaping the control characters.

Command and Response

- ▶ CALL /MEDIA/UART/P1:sendBinaryMessage(<message>)
- ◀ mO /MEDIA/UART/P1:sendBinaryMessage

Example

- ▶ CALL /MEDIA/UART/P1:sendBinaryMessage(433030)
- ◀ mO /MEDIA/UART/P1:sendBinaryMessage

The '433030' message is sent out via the P1 serial port.

7.14.4. Using Hexadecimal Codes

Hexadecimal codes can be inserted in the ASCII message when using:

sendMessage command: CALL /MEDIA/UART/P1:sendMessage(C00\x0D)

tcpMessage command: CALL /MEDIA/ETHERNET:tcpMessage(C00\x0D)

udpMessage command: CALL /MEDIA/ETHERNET:udpMessage(C00\x0D)

- **C00:** the message.
- **\x:** indicates that the following is a hexadecimal code.
- **0D:** the hexadecimal code (Carriage Return).

7.15. LW3 Quick Summary

System Commands

Query the Product Name

- ▶ GET·/.ProductName

Set the Device Label

- ▶ SET·/MANAGEMENT/ LABEL.DeviceLabel=<custom_name>

Query the Serial Number

- ▶ GET·/.SerialNumber

Query the Firmware Version

- ▶ GET·/SYS/MB.FirmwareVersion

Resetting the Device

- ▶ CALL·/SYS:reset()

Restore the Factory Default Settings

- ▶ CALL·/SYS:factoryDefaults()

Enable PoE

- ▶ SET·/SYS/MB/POE.PoeEnabled=<PoE_status>

Time Settings

Query the Timezone

- ▶ SET·/SYS/MB/TIMEZONE.Timezone=<timezone>

Enable Network Time Protocol (NTP)

- ▶ SET·/SYS/MB/NTP.Enable=<enable_ntp>

Enable Getting NTP from DHCP server

- ▶ SET·/SYS/MB/NTP.NtpServerFromDhcp=<enable_ntp_dhcp>

Query the Active NTP Server

- ▶ GET·/SYS/MB/NTP.ActiveNtpServer

Set NTP server

- ▶ SET·/SYS/MB/NTP.NtpServer=<server_address>

Synchronize with the NTP server

- ▶ CALL·/SYS/MB/NTP:updateTime()

Query the Last Synchronization

- ▶ GET·/SYS/MB/RTC.LastUpdate

Query the Universal Time Coordinated Time (UTC)

- ▶ GET·/SYS/MB/RTC.UtcTime

Query the Local Time (RTC)

- ▶ GET·/SYS/MB/RTC.LocalTime

Query the Local Time (RTC) Elements

- ▶ GET·/SYS/MB/RTC.<RTC_element>

Button Configuration

Lock the Front Panel Functionality

- ▶ SET·/MANAGEMENT/UI.ControlLock=<lock_status>

Lock the Buttons Separately

- ▶ SET·/MANAGEMENT/UI/BUTTONS/<btn_ID>.Enabled=<btn_lock_status>

Set the Button Operation Mode

- ▶ SET·/MANAGEMENT/UI/BUTTONS/<btn_ID>.Mode=<btn_mode>

Set the Button Interaction State

- ▶ SET·/MANAGEMENT/UI/BUTTONS/<btn_ID>.State=<btn_state>

Set the Button Name

- ▶ SET·/MANAGEMENT/UI/BUTTONS/<btn_ID>. Name=<btn_name>

Set the Icon for the Button

- ▶ SET·/MANAGEMENT/UI/BUTTONS/<btn_ID>.IconId=<icon_ID>

Set the Label for the Button

- ▶ SET·/MANAGEMENT/UI/BUTTONS/<btn_ID>. IconId=<row1>;<row2>;<row3>

Clear the Button Style

- ▶ SET·/MANAGEMENT/UI/BUTTONS/<btn_ID>. IconId=<icon_ID>

Button Status Indicators

- ▶ GET·/MANAGEMENT/UI/BUTTONS/<btn_ID>/BUTTON.Latch
- ▶ GET·/MANAGEMENT/UI/BUTTONS/<btn_ID>/BUTTON.ActualStatus
- ▶ GET·/MANAGEMENT/UI/BUTTONS/<btn_ID>/BUTTON.Clicked
- ▶ GET·/MANAGEMENT/UI/BUTTONS/<btn_ID>/BUTTON.LongPress

Button LED Configuration**Enable the Button LED**

- ▶ SET·/MANAGEMENT/UI/LEDS/<LED_ID>.Enabled=<LED_enable>

Set the Default Intensity of the Low Bright

- ▶ SET·/MANAGEMENT/UI/LEDS.LowBright=<light_intensity>

Set the Default Intensity of the High Bright

- ▶ SET·/MANAGEMENT/UI/LEDS.HighBright=<light_intensity>

Set Background Light of the Button

- ▶ SET·/MANAGEMENT/UI/LEDS/<LED_ID>.TrueFunction=<light_mode>
- ▶ SET·/MANAGEMENT/UI/LEDS/<LED_ID>.FalseFunction=<light_mode>

Set the Background Light for a Period of Time

- ▶ CALL·/MANAGEMENT/UI/LEDS/<led_ID>:<button_func>(<time>)

Button Group Configuration**Query the Group Members**

- ▶ GET·/MANAGEMENT/UI/GROUP/<group_ID>.GroupMembers

Set the Active Button

- ▶ SET·/MANAGEMENT/UI/GROUP/<group_ID>.Active=<btn_nr>

Volume Control Configuration**Control Lock of the Jog Dial**

- ▶ SET·/MANAGEMENT/UI/VOLUMECONTROL.Enabled=<enabled>

Set the Volume

- ▶ SET·/MANAGEMENT/UI/VOLUMECONTROL.Volume=<volume_value>

Mute the Volume

- ▶ SET·/MANAGEMENT/UI/VOLUMECONTROL.Mute=<mute_state>

Volume Control (Jog Dial) Status Indicators

- ▶ GET·/MANAGEMENT/UI/VOLUMECONTROL/ROTARY.RotaryPosition
- ▶ GET·/MANAGEMENT/UI/VOLUMECONTROL/ROTARY.ActualStatus
- ▶ GET·/MANAGEMENT/UI/VOLUMECONTROL/ROTARY.LongPress
- ▶ GET·/MANAGEMENT/UI/VOLUMECONTROL/ROTARY.Clicked

Network Configuration**Query the DHCP State**

- ▶ GET·/MANAGEMENT/NETWORK.DhcpEnabled

Change the DHCP State

- ▶ SET·/MANAGEMENT/NETWORK.DhcpEnabled=<DHCP_state>

Query the IP Address

- ▶ GET·/MANAGEMENT/NETWORK.IpAddress

Change the IP Address (Static)

- ▶ SET·/MANAGEMENT/NETWORK.StaticIpAddress=<IP_address>

Query the Subnet Mask

- ▶ GET·/MANAGEMENT/NETWORK.NetworkMask

Change the Subnet Mask (Static)

- ▶ SET·/MANAGEMENT/NETWORK.StaticNetworkMask=<netmask>

Query the Gateway Address

- ▶ GET·/MANAGEMENT/NETWORK.GatewayAddress

Change the Gateway Address (Static)

- ▶ SET·/MANAGEMENT/NETWORK.StaticGatewayAddress=<gw_add>

Apply Network Settings

- ▶ CALL·/MANAGEMENT/NETWORK:ApplySettings()

RS-232 Port Configuration**Protocol Setting**

- ▶ SET·/MEDIA/UART/P1.ControlProtocol=<cont_protocol>

BAUD Rate Setting

- ▶ SET·/MEDIA/UART/P1.Baudrate=<baud_rate>

Databit Setting

- ▶ SET·/MEDIA/UART/P1.DataBits=<databit>

Stopbits Setting

- ▶ SET·/MEDIA/UART/P1.StopBits=<stopbit>

Parity Setting

- ▶ SET·/MEDIA/UART/P1.Parity=<parity>

RS-232 Operation Mode

- ▶ SET:/MEDIA/UART/P1.Rs232Mode=<rs232_mode>

Command Injection Mode

- ▶ SET:/MEDIA/UART/P1.CommandInjectionEnable=<CI_enable>

RS-232 Recognizer**Enable the Recognizer**

- ▶ SET:/MEDIA/UART/P1.RecognizerEnable=<recognizer_enable>
- ▶ pw:/MEDIA/UART/P1.RecognizerEnable=<recognizer_enable>

Set the Delimiter Hex

- ▶ SET:/MEDIA/UART/RECOGNIZER.DelimiterHex=<delimiter>

Set the Timeout

- ▶ SET:/MEDIA/UART/RECOGNIZER.TimeOut=<timeout>

Query the Last Recognized Serial Message (Rx, RxHex, Hash)

- ▶ GET:/MEDIA/UART/RECOGNIZER.Rx
- ▶ GET:/MEDIA/UART/RECOGNIZER.RxHex
- ▶ GET:/MEDIA/UART/RECOGNIZER.Hash

Clear the Stored Last Recognized Serial Message

- ▶ CALL:/MEDIA/UART/RECOGNIZER:clear()

Query the Last Recognized Serial Message (ActiveRx, ActiveRxHex, ActiveHash)

- ▶ GET:/MEDIA/UART/RECOGNIZER.ActiveRx
- ▶ GET:/MEDIA/UART/RECOGNIZER.ActiveRxHex
- ▶ GET:/MEDIA/UART/RECOGNIZER.ActiveHash

Set the Active Timeout

- ▶ SET:/MEDIA/UART/RECOGNIZER.ActivePropertyTimeout=<a_timeout>

Infrared Port Configuration

- ▶ SET:/MEDIA/IR/S1.CommandInjectionEnable=<ci_status>

GPIO Port Configuration**Set the Direction of a GPIO Pin**

- ▶ SET:/MEDIA/GPIO/<gpio_port>.Direction=<dir>

Set the Output Level of a GPIO Pin

- ▶ SET:/MEDIA/GPIO/<gpio_port>.Output=<value>

Toggle the Level of a GPIO Pin

- ▶ CALL:/MEDIA/GPIO/<gpio_port>:toggle()

Sending Message via the Communication Ports**Sending a TCP Message (ASCII-format)**

- ▶ CALL:/MEDIA/ETHERNET:tcpMessage(<IP_address>:<port_no>=<message>)

Sending a TCP Text (ASCII-format)

- ▶ CALL:/MEDIA/ETHERNET:tcpText(<IP_address>:<port_no>=<text>)

Sending a TCP Binary Message (HEX-format)

- ▶ CALL:/MEDIA/ETHERNET:tcpBinary(<IP_address>:<port_no>=<HEX_message>)

Sending UDP Message (ASCII-format)

- ▶ CALL:/MEDIA/ETHERNET:udpMessage(<IP_address>:<port_no>=<message>)

Sending a UDP Text (ASCII-format)

- ▶ CALL:/MEDIA/ETHERNET:udpText(<IP_address>:<port_no>=<text>)

Sending a UDP Binary Message (HEX-format)

- ▶ CALL:/MEDIA/ETHERNET:udpBinary(<IP_address>:<port_no>=<HEX_message>)

Sending a Message (ASCII-format) via RS-232

- ▶ CALL:/MEDIA/UART/P1:sendMessage(<message>)

Sending a Text (ASCII-format) via RS-232

- ▶ CALL:/MEDIA/UART/P1:sendText(<message>)

Sending a Binary Message (HEX-format) via RS-232

- ▶ CALL:/MEDIA/UART/P1:sendBinaryMessage(<message>)

8

Firmware Upgrade

This chapter is meant to help customers perform firmware upgrades on our products by giving a few tips on how to start and by explaining the features of the Lightware Device Updater v2 (LDU2) software. To get the latest software and firmware pack can be downloaded from www.lightware.com.

- ▶ [ABOUT THE FIRMWARE PACKAGE \(LFP2 FILE\)](#)
- ▶ [INSTALLATION](#)
- ▶ [FIRMWARE UPGRADING STEPS](#)

ATTENTION! The firmware upgrade process has an effect on the configuration and the settings of the device. For more details, please see the [Firmware Upgrading Steps](#) section before the upgrade.

8.1. About the Firmware Package (LFP2 File)

The firmware files are packed in an LFP2 package. You need only this file to do the upgrade on your device.

- This allows using the same LFP2 package for different devices.
- The package contains all the necessary components, binary, and other files; You do not have to get further files.
- There is a descriptor file in the package that contains each firmware with version number and a list showing the compatible devices. The descriptor is displayed after loading the LFP2 file in the LDU2.

8.2. Installation

Minimum System Requirement

RAM: 1 GB

Installation modes

LDU2 has two installation modes: Normal and Snapshot.

Normal install	Snapshot install
Available for Windows and macOS	Available for Windows
The installer can update only this instance	Cannot be updated
Only one updateable instance can exist for all users	More than one different versions can be installed for all users

ATTENTION! Using the Normal install as the default value is highly recommended.

Installation for Windows

Run the installer. If the User Account Control displays a pop-up message click **Yes**. During the installation you will be prompted to select the type of the installation:

Installation for macOS

Mount the DMG file with double clicking on it and drag the LDU2 icon over the Applications icon to copy the program into the Applications folder. If you want to copy the LDU2 into another location just drag the icon over the desired folder.

INFO: The Windows and the Mac application has the same look and functionality.

8.3. Firmware Upgrading Steps

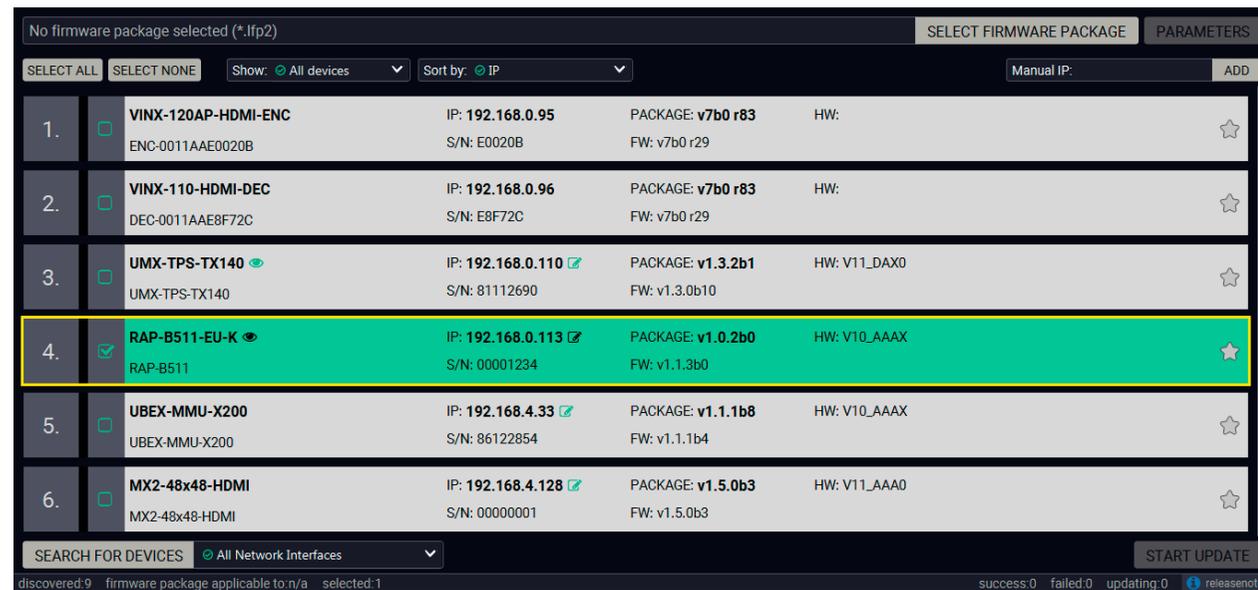
ATTENTION! While the firmware is being upgraded, the normal operation mode is suspended as the device is switched to bootload mode. Do not interrupt the firmware upgrade. If any problem occurs, reboot the device and restart the process.

Step 1. Connect the computer to the same network as the RAP-B511 is located. Run the LDU2 software. Click on the **Search for devices** button to load the discovered and known devices.

INFO: When you connected more than one network there is an option to browse the devices by the network. Put a tick in the drop-down menu to choose the network where to discover the devices.

Manual IP text box is for add the device by its IP address. Click on the **Add** button to execute.

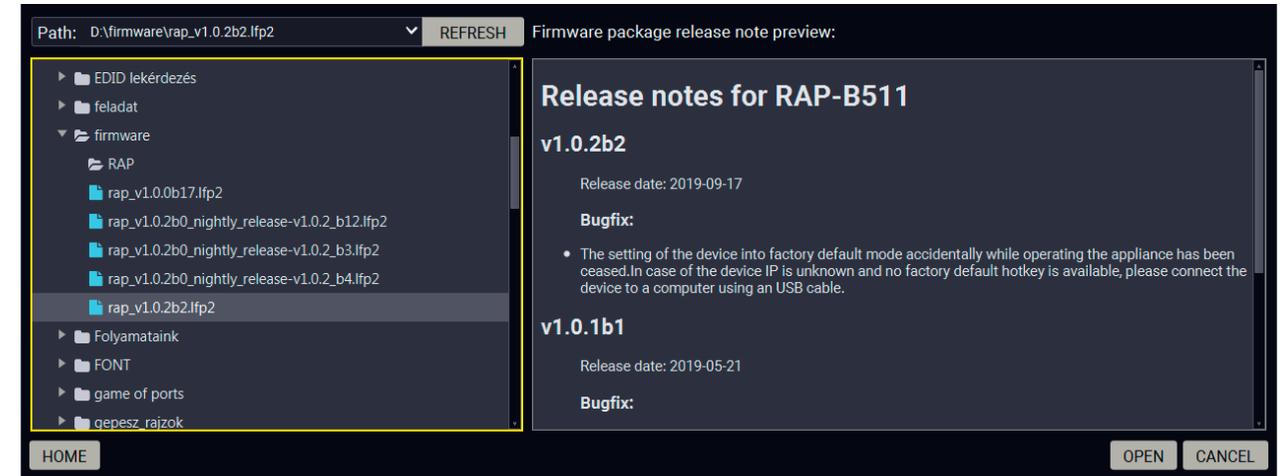
Step 2. Click on the device(s) to select for the upgrade.



Legend of the Icons

Icon	Name	Description
	Identify the device	Clicking on the icon causes all the front panel LEDs blink for 10 seconds. The feature helps to identify the device itself.
	IP address editor	To modify IP address settings quickly it is not necessary to enter the device's settings/network menu, you can set them by clicking the pencil icon next to the IP address.

Step 3. Select the firmware package file (*.lfp2). When the file is selected the release note is displayed in the right window. Please read it carefully.



Step 4. Check the upgrade parameters.

ATTENTION! The default settings in the Parameters window should be fine for most cases. Please do not modify them if it is not necessary.

Click on the **Parameters** button to configure the firmware upgrade.

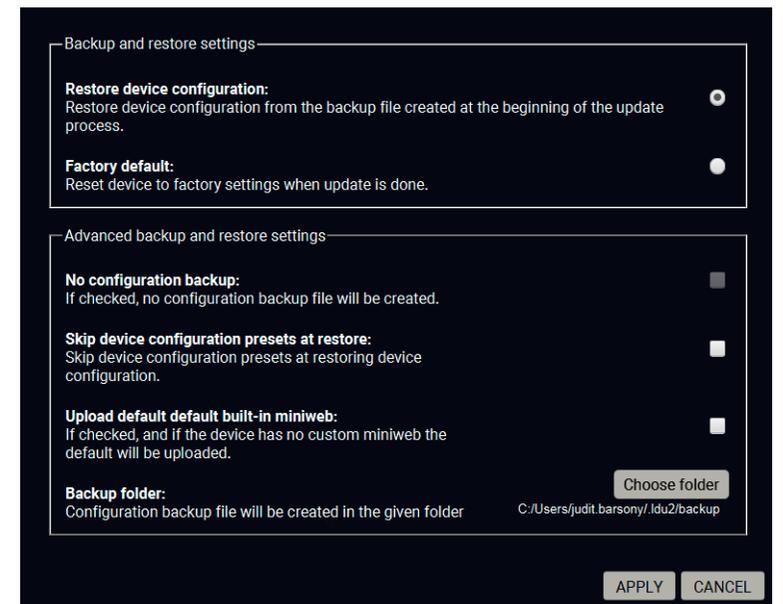
Backup and Restore settings

Restore device configuration: restore device configuration from the backup file created at the beginning of the update process.

Factory default: if it is selected, all user settings and parameters will be cleared and the factory default settings will be applied to the device when the upgrade is done. See the whole list of factory default settings of the endpoint device in the [Factory Default Settings](#) section.

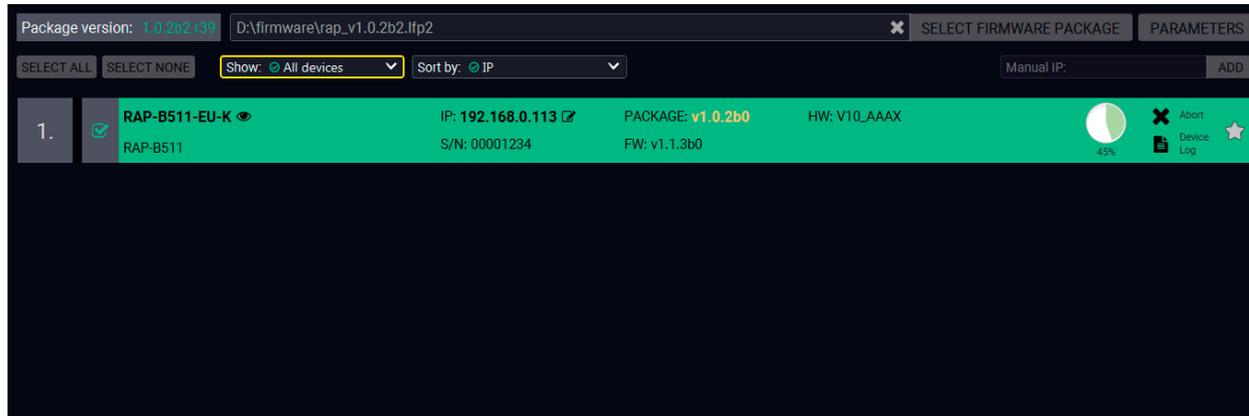
Upload default miniweb: check if the [Default miniweb page](#) is needed.

Once the parameters are set, click on the **Apply** button to save the settings.

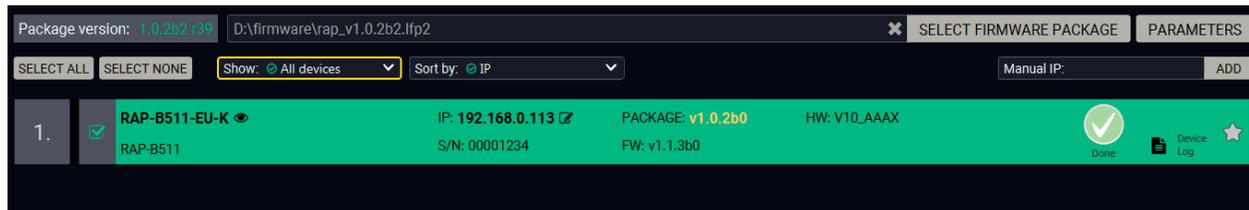


Step 5. Press the Start Update button.

The upgrade takes about 4-5 minutes to finish which is independent of the number of the upgraded devices since the upgrades are processed simultaneously.



Step 6. Wait until the unit reboots with the new firmware. Once the firmware upgrade procedure is completed, the unit reboots with the new firmware.



9

Troubleshooting

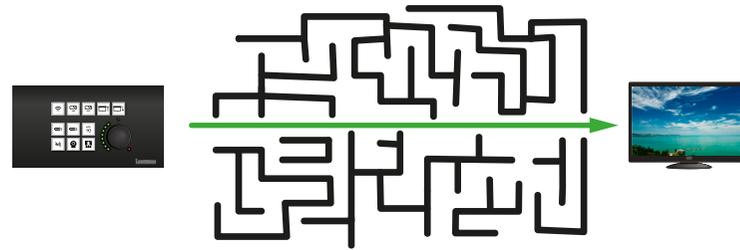
Usually, if the system seems not to transport the signal as expected, the best strategy for troubleshooting is to check signal integrity through the whole signal chain starting from source side and moving forward to device end.

At first, check front panel LEDs and take the necessary steps according to their states. For more information about status, LEDs refer to [Front View](#) and [Rear View](#) sections.

Symptom	Root cause	Action
RS-232 signal		
Connected serial device does not respond	Cable connection problem	Check the connectors to fit well; check the wiring of the plugs.
	RS-232 settings are different	Check the port settings of the RAP-B511 and the connected serial device(s).
	RS-232 mode is not right	Check the RS-232 mode settings (control, command injection, or disconnected)
Network		
No LAN connection can be established	Incorrect IP address is set (fix IP)	Use dynamic IP address by enabling DHCP option.
		Restore the factory default settings (with fix IP).
	IP address conflict	Check the IP address of the other devices, too.
GPIO		
Connected device does not respond	Cable connection problem	Check the connectors to fit well; check the wiring of the plugs.
Output level cannot be changed	The direction of the selected pin is set to input	Check and modify the direction setting of the desired pin
Miscellaneous		
Front panel buttons are out of operation	Buttons are set as locked in LDC	Unlock the buttons

9.1. How to Speed Up the Troubleshooting Process

Lightware's technical support team is always working hard to provide the fastest support possible. Our team's response time is one of the best in the industry and in the toughest of cases we can directly consult with the hardware or software engineer who designed the product to get the information from the most reliable source.



However, the troubleshooting process can be even faster... with your help.

There are certain pieces of information that push us in the right direction to finding the root cause of the problem. If we receive most of this information in the first e-mail or it is gathered at the time when you call us, then there is a pretty high chance that we will be able to respond with the final solution right away.

This information is the following:

- Schematic (a pdf version is preferred, but a hand drawing is sufficient).
- Serial number(s) of the device(s) (it is either printed somewhere on the box or you can query it in the Device Controller software or on the built-in website).
- Firmware versions of the devices (please note that there may be multiple CPUs or controllers in the device and we need to know all of their firmware versions, a screenshot is the best option).
- Cable lengths and types (in our experience, it's usually the cable).
- Patch panels, gender changers or anything else in the signal path that can affect the transmission.
- Signal type (resolution, refresh rate, color space, deep color).
- Emulated EDID(s) (please save them as file and send them to us).
- Actions to take in order to re-create the problem (if we cannot reproduce the problem, it is hard for us to find the cause).
- Photo or video about the problem ('image noise' can mean many different things, it's better if we see it too).
- Error logs from the Device Controller software.
- In the case of Event Manager issue the event file and/or backup file from the Device Controller software.

The more of the above information you can give us the better. Please send these information to the Lightware Support Team (support@lightware.com) to speed up the troubleshooting process.

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Appendix

Tables, drawings, guides, and technical details as follows:

- ▶ [HOW TO SPEED UP THE TROUBLESHOOTING PROCESS](#)
- ▶ [SPECIFICATION](#)
- ▶ [WIRING GUIDE FOR RS-232 DATA TRANSMISSION](#)
- ▶ [FACTORY DEFAULT SETTINGS](#)
- ▶ [MECHANICAL DRAWINGS](#)
- ▶ [BUTTON NUMBERING](#)
- ▶ [FURTHER INFORMATION](#)

10.1. Specification

General

Compliance	CE
Safety	IEC/EN 62368-1:2014
EMI/EMC	IEC/EN 55035:2017, IEC/EN 55032:2015
Warranty	3 years
Cooling.....	Passive
Operating temperature	0 to +50°C (+32 to +122°F)
Operating humidity	10% to 90%, non-condensing

Power

Power supply	external power adaptor / PoE (IEEE 802.3af) via Ethernet
PoE connector.....	RJ45
Power adaptor	Input 100-240 V AC 50/60 Hz, Output 48V DC, 0.5 A
Power connector.....	2-pole Phoenix
Power consumption (supplied by local power)	1,78W
Power consumption (supplied by PoE)	1,87W

Enclosure

Rack mountable	No
Material.....	1 mm steel
Dimensions in mm (-EU).....	152 W x 58.1 D* x 82 H
Dimensions in mm (-UK)	140 W x 58.1 D* x 80 H
Dimensions in mm (-US).....	115.9 W x 58.1 D* x 115.9 H
*with the front panel and rotaty knob	
Weight (-EU)	412g
Weight (-UK)	380g
Weight (-US)	433g

Control Ethernet

Connector type.....	Locking RJ45
Ethernet data rate.....	10/100Base-T, full duplex with autodetect
Power over Ethernet (PoE)	PoE in (1x), PoE out (1x)

RS-232

Connector type.....	3-pole Phoenix connector
Available Baud rates.....	between 4800 and 115200 baud
Available Data bits.....	8 or 9
Available Parity.....	None / Odd / Even
Available Stop bits.....	1 / 1.5 / 2
Output voltage: Low / High level.....	3 - 15V / -15V - 3V

Infra

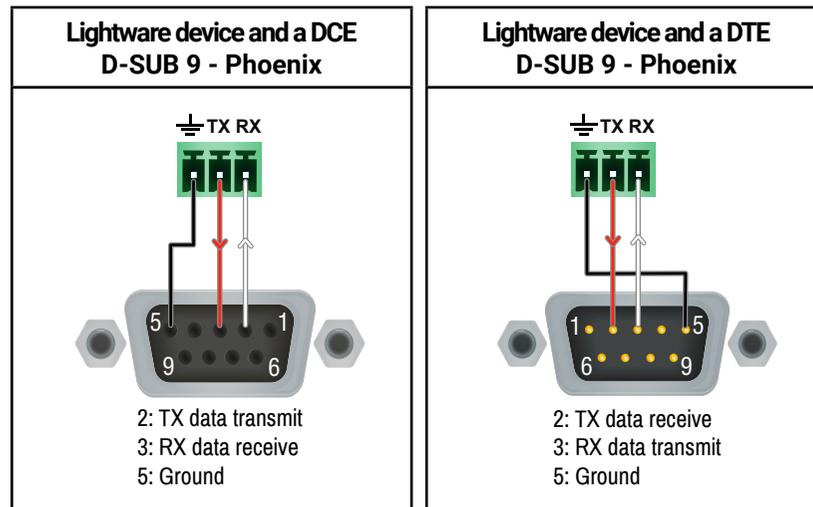
Connector type.....	Built-in IR detector
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GPIO

Connector type.....	4-pole Phoenix connector
Number of configurable pins.....	3
Port direction.....	Input or output
Input voltage: Low / High level.....	0 - 0,8V / 2 - 5V
Output voltage: Low / High level.....	0 - 0,5 V / 4.5 - 5 V
Max. current: Low / High level	30 mA / 18 mA
Total available current	180 mA

10.2. Wiring Guide for RS-232 Data Transmission

Room Automation Panel is built with 3-pole Phoenix connector. See the below examples of connecting to a DCE (Data Circuit-terminating Equipment) or a DTE (Data Terminal Equipment) type device:



INFO: The RAP-B511 series works as a DCE unit according to its pin-out.

10.3. Factory Default Settings

Parameter	Setting/Value
Button settings	
Button enabled	true
Operation mode	0
Interaction state	true
EnabledLED	true
LED function for True state	off
LED function for False state	off
Button LED lowbright level	2
Button LED highbright level	5
Network settings	
IP address	192.168.0.100
Subnet mask	255.255.255.0
Static gateway	192.168.0.1
DHCP	Disabled
LW2 port number	10001
LW3 port number	6107
HTTP port number	80
RS-232 settings	
Control protocol	LW2
Baud rate	57600
Databits	8
Parity	No
Stopbits	1
Operation mode	Command Injection
Command injection port nr.	8001
Recognizer delimiter	0D0A
Recognizer Timeout	0 (disabled)
Recognizer Active property timeout	50

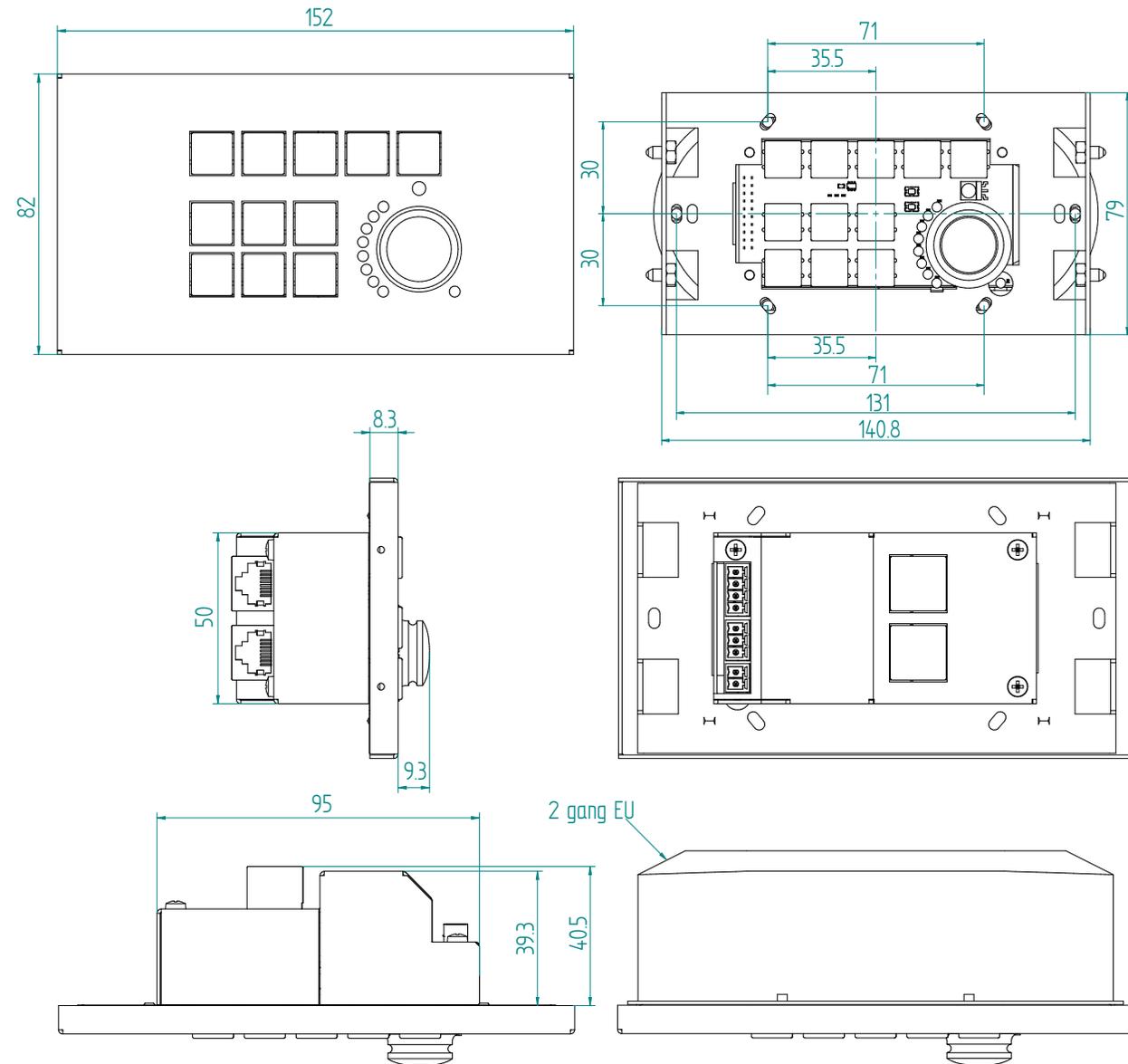
Parameter	Setting/Value
IR port settings	
Command injection status	Enabled
Command injection input port nr.	9001
GPIO port settings	
Output level	High
Direction	Input

10.4. Mechanical Drawings

Dimensions are in mm.

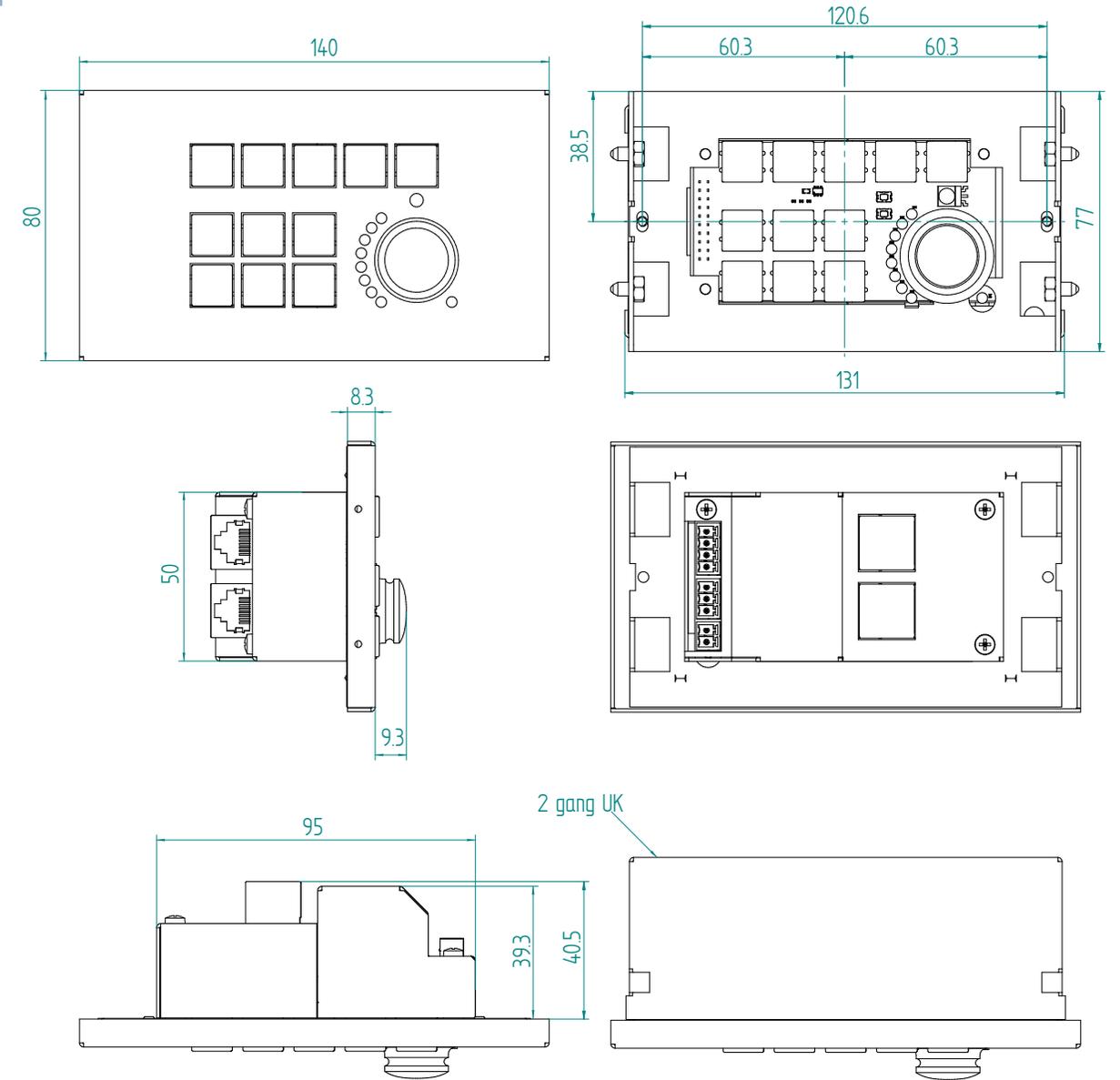
RAP-B511-EU -K, -W, -S

INFO: All the RAP-B511-EU models have the same size.



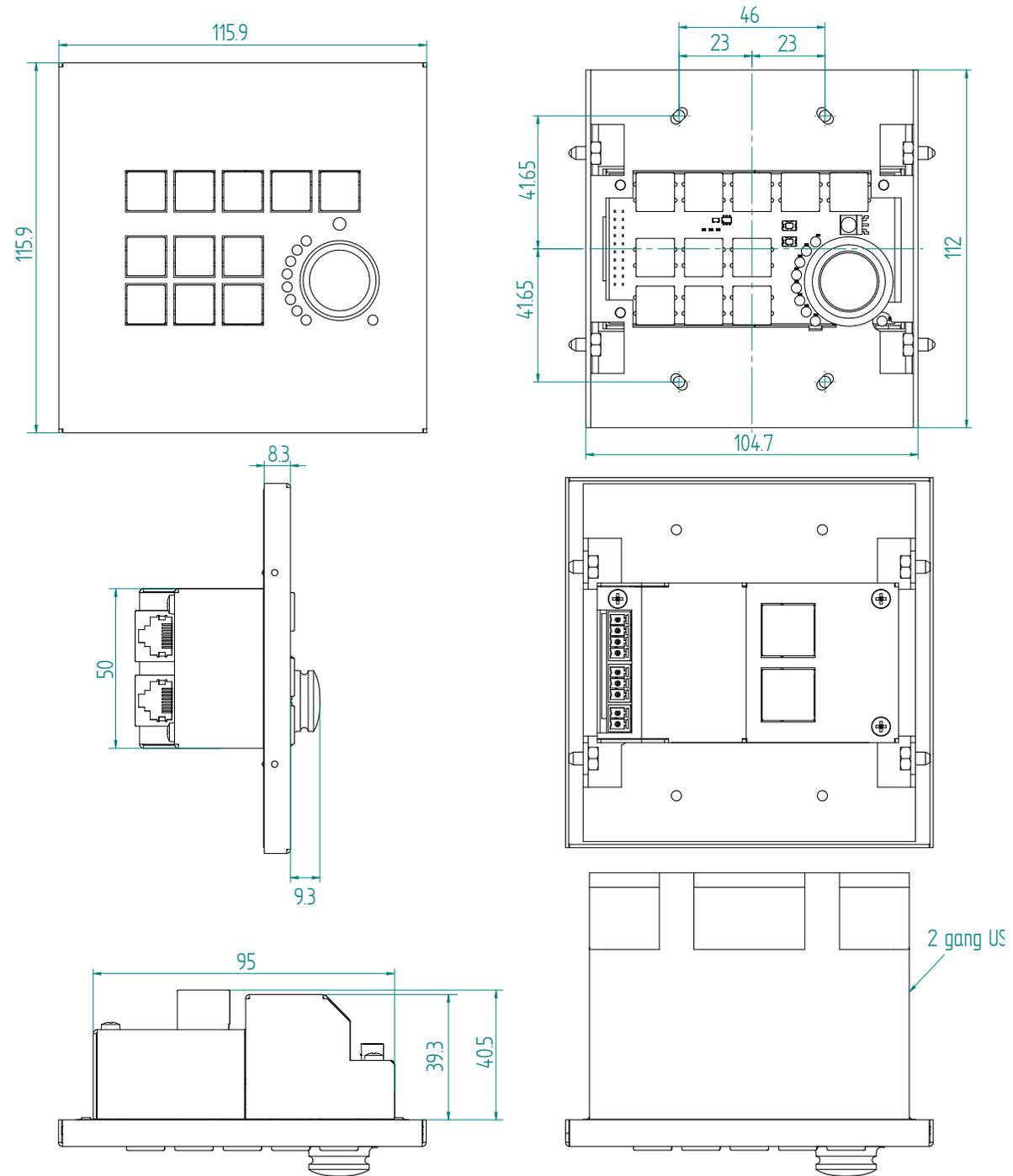
RAP-B511-UK -K, -W, -S

INFO: All the RAP-B511-UK models have the same size.

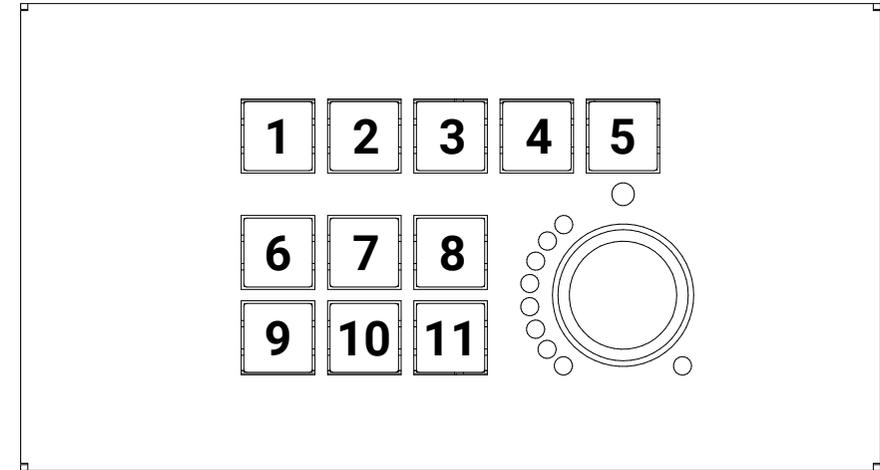


RAP-B511-US -K, -W, -S

INFO: All the RAP-B511-US models have the same size.



10.5. Button Numbering



10.6. Further Information

Limited Warranty Statement

1. Lightware Visual Engineering LLC (Lightware) warrants to all trade and end user customers that any Lightware product purchased will be free from manufacturing defects in both material and workmanship for three (3) years from purchase unless stated otherwise below. The warranty period will begin on the latest possible date where proof of purchase/delivery can be provided by the customer. In the event that no proof can be provided (empty 'Date of purchase' field or a copy of invoice), the warranty period will begin from the point of delivery from Lightware.

1.1. 25G and MODEX product series will be subject to a seven (7) year warranty period under the same terms as outlined in this document.

1.2. If during the first three (3) months of purchase, the customer is unhappy with any aspect of a Lightware product, Lightware will accept a return for full credit.

1.3. Any product that fails in the first six (6) months of the warranty period will automatically be eligible for replacement and advanced replacement where available. Any replacements provided will be warranted for the remainder of the original unit's warranty period.

1.4. Product failures from six (6) months to the end of the warranty period will either be repaired or replaced at the discretion of Lightware. If Lightware chooses to replace the product then the replacement will be warranted for the remainder of the original unit's warranty period.

2. The above-stated warranty and procedures will not apply to any product that has been:

2.1. Modified, repaired or altered by anyone other than a certified Lightware engineer unless expressly agreed beforehand.

2.2. Used in any application other than that for which it was intended.

2.3. Subjected to any mechanical or electrical abuse or accidental damage.

2.4. Any costs incurred for repair/replacement of goods that fall into the above categories (2.1., 2.2., 2.3.) will be borne by the customer at a pre-agreed figure.

3. All products to be returned to Lightware require a return material authorization number (RMA) prior to shipment and this number must be clearly marked on the box. If an RMA number is not obtained or is not clearly marked on the box, Lightware will refuse the shipment.

3.1. The customer will be responsible for in-bound and Lightware will be responsible for out-bound shipping costs.

3.2. Newly repaired or replaced products will be warranted to the end of the originally purchased products warranty period.

Document Revision History

Rev.	Release date	Changes	Editor
1.0	2019-06-04	Initial version	Judit Barsony
1.1	2019-06-11	Minor corrections	Judit Barsony
1.2	2019-06-26	Update mechanical drawings and compatible outlet box types	Judit Barsony
1.3	2019-10-08	Add Styles and Miniweb description to LDC chapter, new screenshots to FW upgrade section	Judit Barsony

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