LIGHTWARE RAP-B511-EU-K Room Automation Panel User Guide

Contents

LIGHTWARE RAP-B511-EU-K Room Automation Panel

Product Information

- **Specifications:**
  - **Model:** RAP-B511
  - **Available Variants:** EU, UK, US
  - **Buttons:** 11 configurable buttons with normal and long press detection
  - **Button Background Light:** Programmable with 5 different modes (off / low bright/high bright/slow blink/sine pulse)
  - **Rotary LEDs:** 8 green-colored LEDs for feedback on the current position of the jog dial knob
  - **Rotary Knob:** Jog dial for volume control on a 16-level scale or other controlling purposes
  - **Mute LED:** Provides feedback on the mute status of the volume
  - **IR Detector:** Built-in IR eye to receive infra signals
  - **Hidden Functions:** USB Port, Reset Button, Factory Default Button, Live LED
- **Introduction:**
  - The Room Automation Panel (RAP) is an integrated room control interface device designed for collaboration spaces.
  - It features a programmable keypad, a volume knob, and a processor running Event Manager, Lightware's proprietary room control application.
  - A button press on the RAP can initiate actions in other Lightware products through the Event Manager.
  - Additionally, scheduled tasks can trigger programmed actions to happen. The RAP can also send commands to or set the volume on third-party devices.
  - The RAP includes a real-time clock with network time protocol and automatic daylight saving adjustment, allowing for scheduled or recurring actions in the Event Manager.
- **Compatible Devices:**
  - The Room Automation Panel has standard RS-232, Ethernet, and GPIO ports that are compatible with other Lightware products or third-party devices with the same connector type.

Product Usage Instructions

- **Buttons:**
  - The RAP-B511 features 11 configurable buttons with normal and long press detection.
  - Each button has a programmable background light.

    - The button background light can be configured for immediate feedback by pushing the buttons or set to five different modes: off, low bright, high bright, slow blink, or sine pulse.
- **Rotary LEDs:**
    - Eight green-colored LEDs on the RAP-B511 provide feedback about the current position of the jog dial knob.
- **Rotary Knob:**
    - The RAP-B511 has a jog dial knob that can be used for volume control on a 16-level scale or be programmed for other controlling purposes by turning and clicking the knob.
- **Mute LED:**
    - The RAP-B511 provides feedback about the mute status of the volume through a mute LED. The LED can be toggled on and off by pushing the rotary knob.
- **IR Detector:**
    - The RAP-B511 has a built-in IR eye to receive infra signals.
- **USB Port:**
    - The RAP-B511 has a hidden USB mini-B connector that can be used for LDC access or firmware upgrades.
- **Reset Button:**
    - There is a hidden reset button on the RAP-B511 that can be used to restart the device.
- **Factory Default Button:**
    - The RAP-B511 has a hidden factory default button that can be used to reload the factory default settings.
- **Live LED:**
    - The RAP-B511 has a live LED that indicates the power status of the unit.
    - When the LED is blinking, the unit is powered and ready to use.
    - When the LED is on, the device is powered but the CPU is not running.
    - When the LED is off, the unit is not powered or out of operation.
- **Connecting Steps:**
    - Connect the RAP-B511 to a projector or relay box.
    - Connect other Lightware devices or third-party devices to the RAP-B511 using the appropriate ports (RS-232, GPIO, or Ethernet).
    - Connect the power adaptor to the DC input of the RAP-B511.
    - Connect an Ethernet cable to the Ethernet port of the RAP-B511.
- **FAQ:**
    - **Q:** Can I customize the labels on the buttons?
    - **A:** Yes, the user can insert the desired label from the attached sheet.
    - **Q:** What are the different modes for the button background light?
    - **A:** The button background light can be configured to be off, low bright, high bright, slow blink, or sine pulse.
    - **Q:** How do I mute/unmute the volume?
    - **A:** The mute status of the volume can be toggled on and off by pushing the rotary knob.
    - **Q:** What are the hidden functions on the front view?
    - **A:** The hidden functions include a USB port for LDC access or firmware upgrade, a reset button to restart the device, a factory default button to reload the factory default settings, and a live LED that indicates the power status of the unit.

Front View

Front View (RAP-B511-EU-K)

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

1. **Buttons**
   11 configurable buttons normal and long press detection. Each button has a programmable background light. They can be configured for immediate feedback by pushing the buttons or can be set to five different modes: off / low bright/high bright/slow blink/sine pulse.
2. **Rotary LEDs**
   Eight green-colored LEDs for giving feedback about the current position of the jog dial knob.
   - **full bright** As the jog dial is rotated right (and the volume increases), the LEDs turn
   - **half bright** on one-by-one. One level means half bright. The picture on the left shows that
   - **off** the volume is set to 11.
3. **Rotary knob**
   Jog dial for volume control on a 16-level scale or 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.

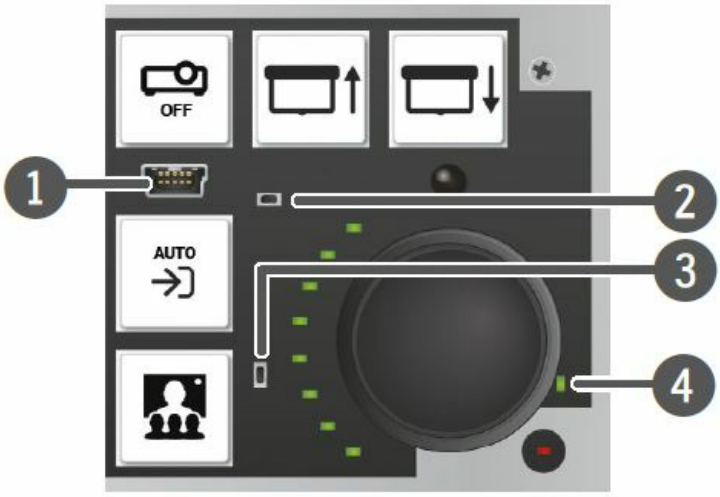
5. **IR detector**

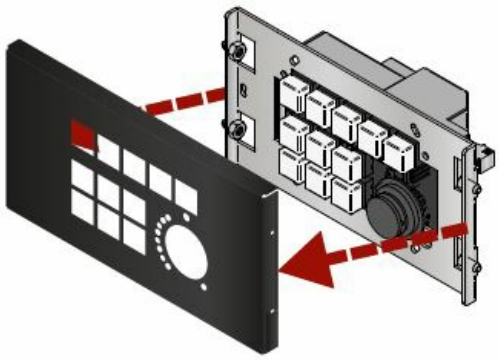
   Built-in IR eye to receive infra signal.

Hidden Functions

Hidden Functions (Front View)

After removing the front plate (no special tool is needed, just pull it apart by hand), a USB connector, two buttons, and a live LED can be seen.





1. **USB Port** A USB mini-B connector can be used for LDC access or firmware upgrades.
2. **Reset the Button** Hidden button to restart the device.
3. **Factory** default Hidden button to reload the factory default settings.
4. **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.

Important Safety Instructions

- Please read the supplied safety instruction document before using the product and keep it available for future reference.

Introduction

- Room Automation Panel (RAP) is an integrated room control interface device for collaboration spaces. RAP features a programmable keypad, a volume knob, and a processor running
- Event Manager, the versatile, proprietary room control application of Lightware.
- A button press can initiate performing actions in other Lightware products by the Event Manager, and scheduled tasks can all trigger programmed actions to happen. The room automation panel can send commands to or set the volume on

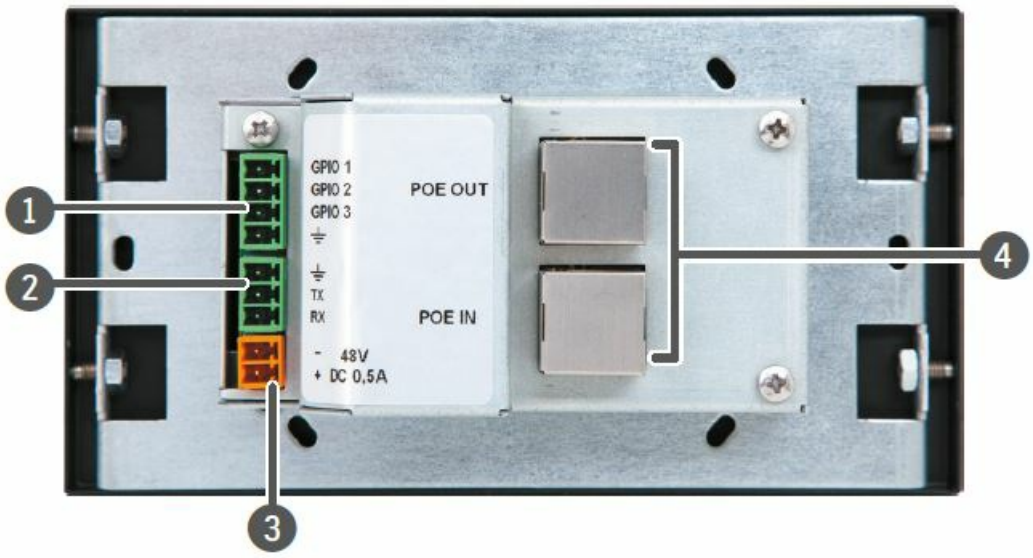
- third-party devices as well.
- A real-time clock with network time protocol and automatic daylight saving adjustment makes it possible to program scheduled or recurring actions in the Event Manager.

Compatible devices

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

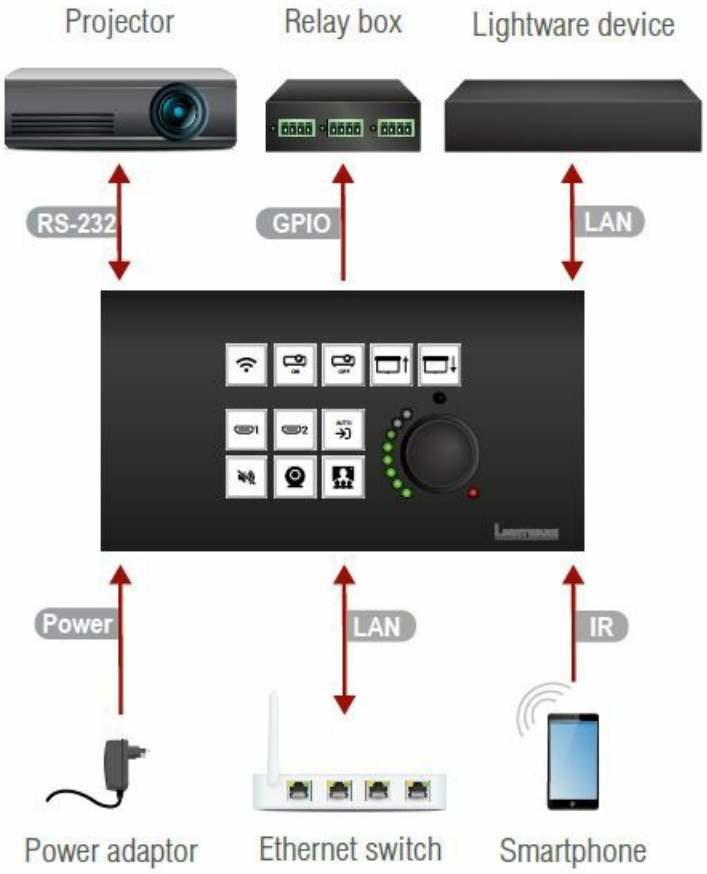
Rear View

Rear View (RAP-B511-EU-K)



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 the powering options below.
4. **Ethernet port** Two RJ45 connectors for Ethernet communication. Both of them are PoE-compatible, one is a PoE receiver, and the other can send PoE.

Connecting Steps



GPIO	Connect a controller/controlled device (e.g. relay box) to the GPIO port.
RS-232	Optionally for RS-232 extension: connect a controller/controlled device (e.g. Projector) to the RS-232 port.
LAN	1. Connect the switcher to a LAN network in order to control the device. 2. 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 Power Supply Options section for the details.

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 on the next page.

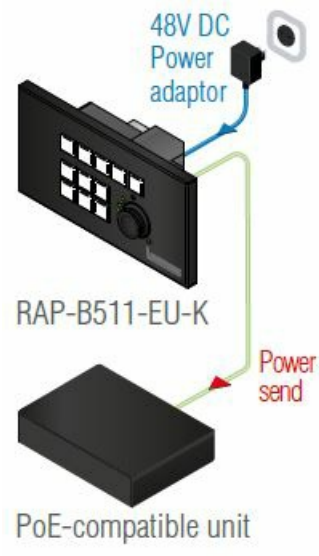
Power Supply Options

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 in any of the following ways:

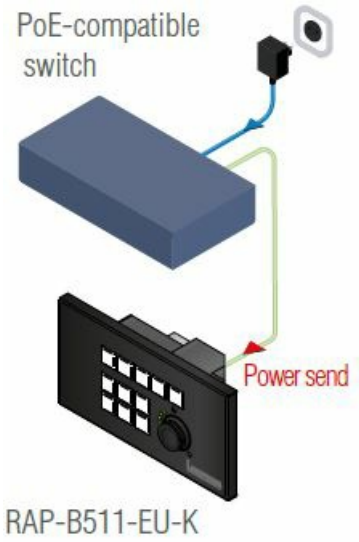
1. **Local adaptor and remote power (PoE OUT)**
    - When it is locally supplied with a 48V DC adaptor, the room automation panel can send remote power via POE OUT RJ45 connector to other PoE-compatible devices.
2. **Remote power injector (PoE IN)**
    - Remotely by a PoE-compatible power injector, like a PoE-compatible switch. Connect it to the POE IN labeled RJ45 connector.
3. **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)

Over the CATx cable, the Ethernet communication is transmitted.

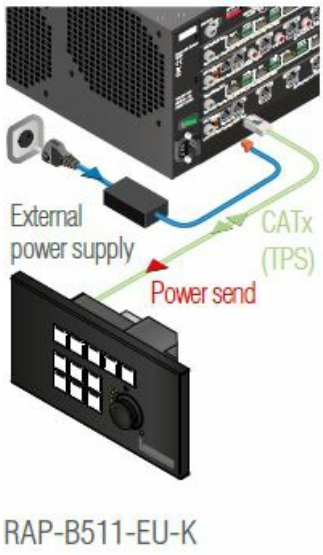
1. Local adaptor and remote power (PoE out)



2. Remote power injector (PoE in)



3. Matrix board (PoE in)



Further information on the device is available at **www.lightware.com**. The User's Manual is also available via the QR code below:

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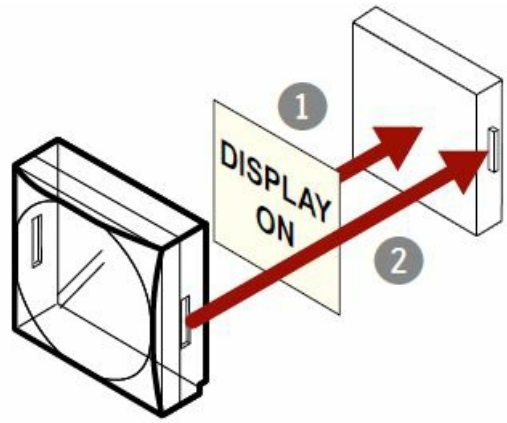
- **Doc. ver.:** 1.2
- 19210024

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 the attached figure:

1. Insert the label.
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°.
3. **The size of the button label:** 9.9 x 9.9 mm.



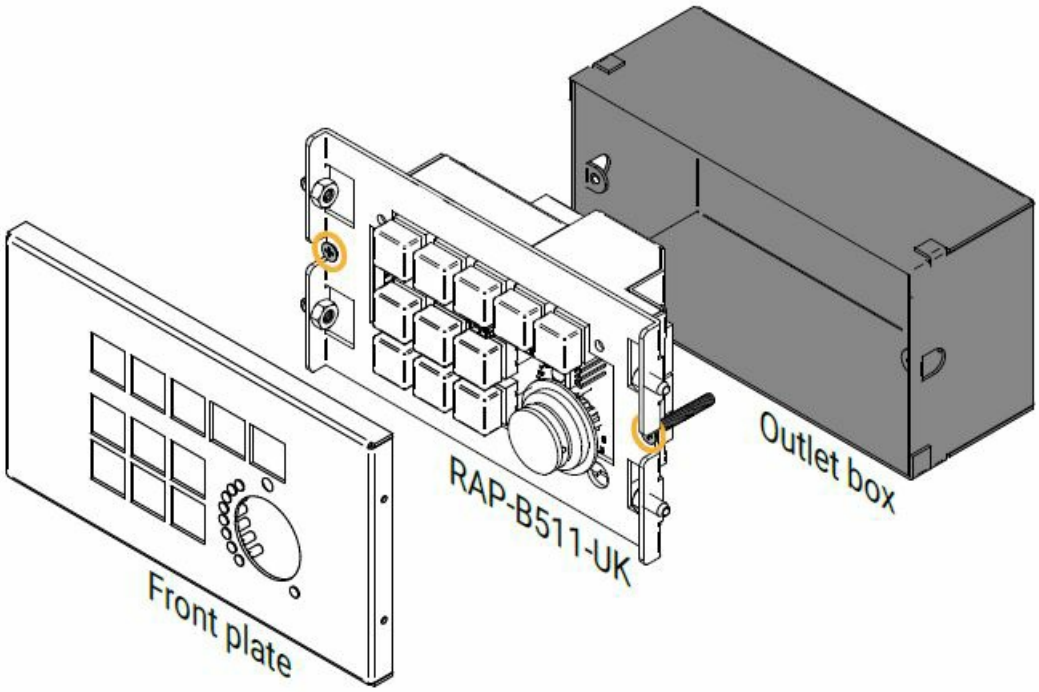
Mounting Options

Model	Recommended outlet box type for mounting
RAP-B511-EU	Double EU wall box (65mm) (e.g. Legrand: 080102, 080122, 080042, 080052, 080142, 2×080141, 2×080151, 2×080161, 081942)
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”)

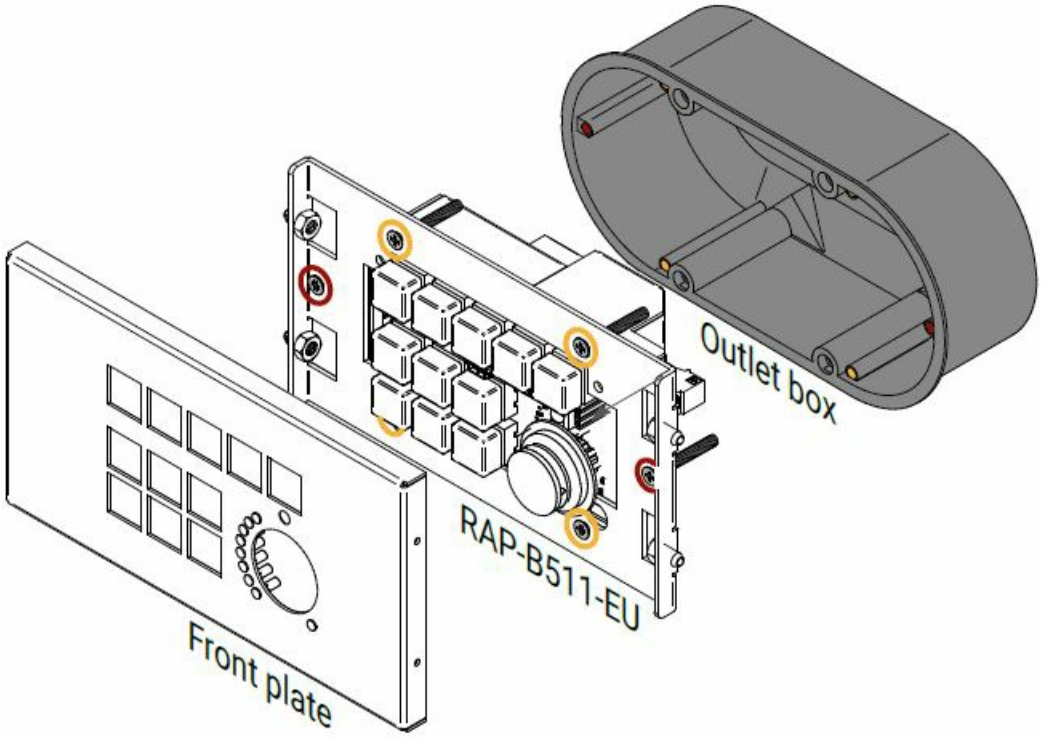
Mount into the Outlet Box

1. Pull apart the Front plate from the RAP-B511 by your hand (no special tool needed).
2. Take four screws over yellow holes (or the two screws over red holes in -EU model).
3. Insert the RAP-B511 into the Outlet box and position it to get the holes aligned.
4. Fasten the front side of the device to the Outlet box by fitting all the screws.
5. Place back the Front plate to the RAP-B511.

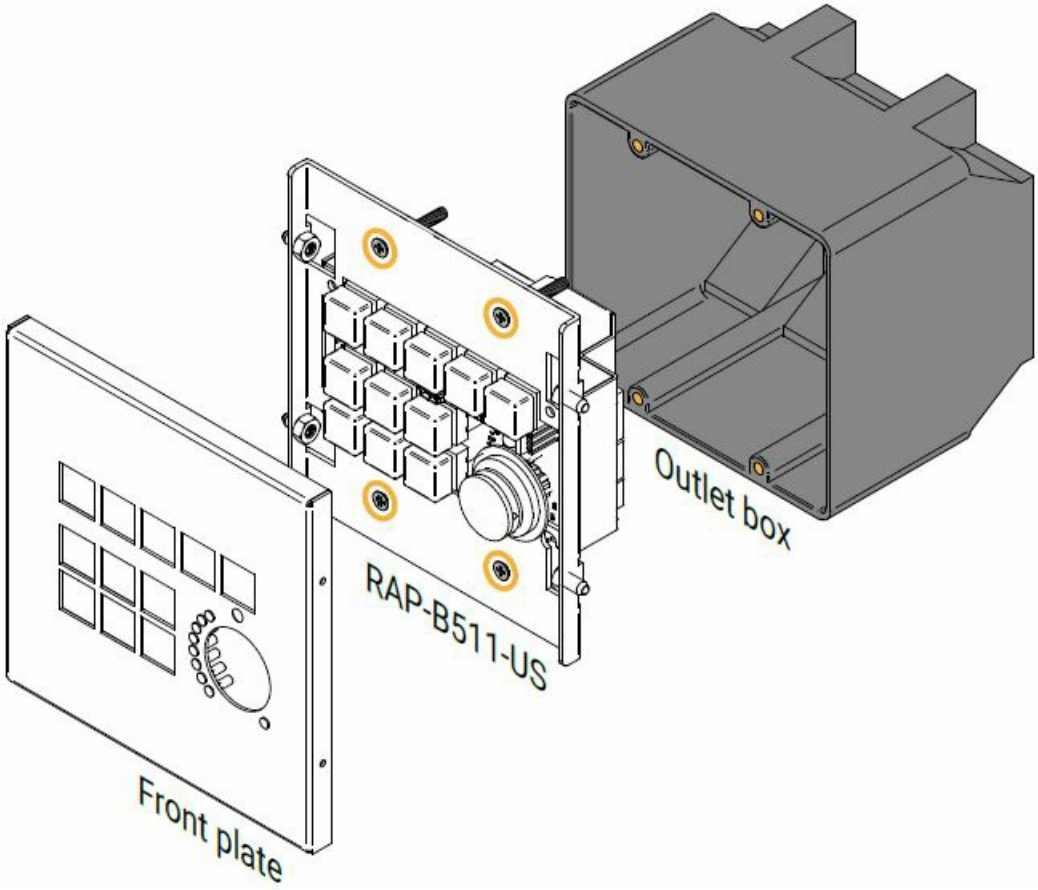
RAP-B511-UK



RAP-B511-EU



RAP-B511-US



Software Control

Software Control – Using Lightware Device Controller (LDC)

The device can be controlled from a computer through the Ethernet port using Lightware Device Controller. Please download the application from **www.lightware.com**, install on Windows PC or macOS and connect to the device via the Ethernet port.

Firmware Upgrade

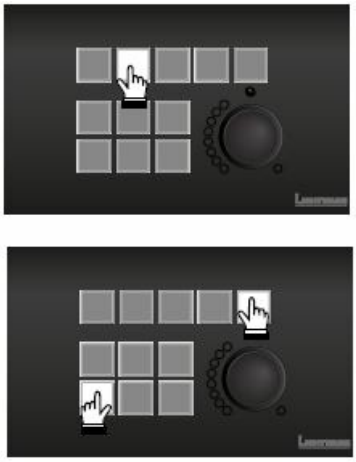
- Lightware Device Updater (LDU2) is an easy and comfortable way to keep your device up to date. Establish the connection via Ethernet.
- Download and install LDU2 software from the company's website **www.lightware.com**. where you can find the latest firmware package as well.

Set Dynamic IP Address (DHCP)

1. Keep the 2nd button pressed for 5 seconds; all front panel LEDs start to blink.
2. Release the button, then press it 3 times quickly. DHCP is now enabled.

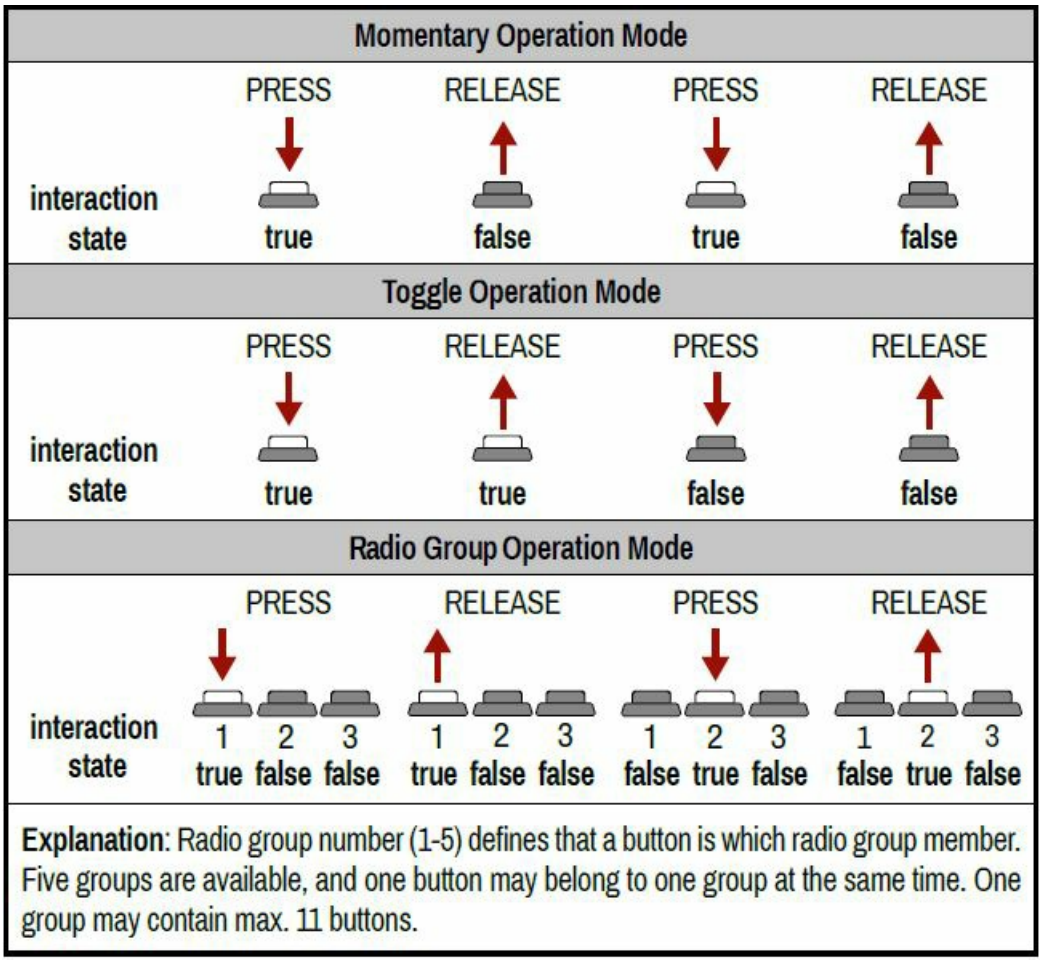
Reset the Device

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



User Interface Configuration – Buttons
These settings can be done from a computer using the Lightware Device Controller (LDC) software (or via LW3 protocol commands).

1. Run the LDC and navigate to the UI Config menu.
2. Click the button icon to select the configurable one.
3. Select a Button operation mode. Three types are available: momentary, toggle, and radio group (1-5). The button 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 value of the interaction state triggers the button LED function and the desired action.
4. Set the button LED function. This property takes into consideration the button interaction state, different functions can be set for the true and the false state. Five LED behaviors are available.
5. Configure the action of the chosen button. Actions are displayed in the thematic list. Click one to choose and specify the details (e.g. IP address or GPIO state) in the pop-up window. Click OK to approve. The actions can be set to execute when the interaction state changes to true or when the interaction state changes to false.
6. Test Button Press can be used to see the working method in practice with LDC software.
7. In the right block of the LDC, all the adjusted actions of the selected button are displayed.



User Interface Configuration – Rotary

These settings can be done from a computer using the Lightware Device Controller (LDC) software or via LW3 protocol commands).

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. It is for setting the volume on a 0-16 scale or the knob press is for toggling between the mute and the unmute states.

1. Run the LDC and navigate to the UI Config menu.
2. Click the rotary icon.
3. Choose the interface for the (volume) command sending (RS-232 port or Ethernet port). When Ethernet is selected, an IP address and port number are also required.
4. Choose a volume control schema: LWR or Custom.
    - **a.** LWR is for controlling the volume of the analog audio output levels of the chosen audio port in any Lightware device. Choose schema in a drop-down menu. (To specify which schema suits your Lightware device, see the User's manual of this appliance on **www.lightware.com**.) After giving the audio port number, the command schema loaded automatically.
      b. Custom 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.
5. Save the Schema.
    - 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 bright.

Restore Factory

Restore Factory Default Settings

1. Keep the 2nd button pressed for 10 seconds; after 5 seconds front panel LEDs start to blink but keep the button pressed; the LEDs start to blink faster 5 seconds later.
2. Release the button, then press it 3 times quickly; the following factory default settings are restored:

IP address (static)	192.168.0.100
Subnet mask	255.255.255.0
Static gateway	192.168.0.1
DHCP	Disabled
TCP/IP port nr. LW2 / LW3	10001 / 6107
RS-232 mode	Command Injection
RS-232 control protocol	LW2
RS-232 port setting	57600 BAUD, 8, N, 1
RS-232 command injection port	8001
IR command injection port	9001
GPIO output level	High
GPIO output direction	Input

Infra

- The device is equipped with a built-in IR detector, so it can be controlled with an IR signal from the remote controller or a smartphone (which has an IR emitter).

- The unit can learn and store 20 pcs fingerprint (hash) codes, which can be set as a condition in the Event Manager.
- This makes it customizable for any third-party remote controller.

GPIO (General Purpose Input/Output Ports)
The device has three GPIO pins which operate 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). The signal levels are the following:

	Input voltage (V)	Output voltage (V)	Max. current (mA)
Logic low level	0 – 0.8	0 – 0.5	30
Logic high level	2 -5	4.5 – 5	18

GPIO connector and plug pin assignment

Pin nr.	Signal
1, 2, 3	Configurable
4	Ground

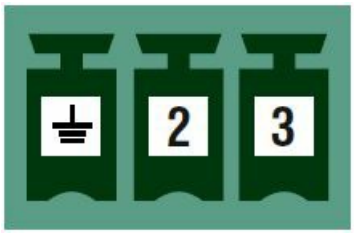
- The total available current of the controller is 180 mA.
- The recommended cable for the connectors is the AWG24 (0.2 mm2 diameter) or the generally used ‘alarm cable’ with 4×0.22 mm2 wires.

Ethernet

- The Ethernet port on the RAP-B511 can be connected to a LAN hub, switch, or router with a LAN cable.
- The other one behaves as an Ethernet uplink port.
- The device supports 10/100 Mbps data transfer rate.
- The Ethernet port has an auto crossover function.
- It can recognize and handle both cable types: patch and cross TP cables.

RS-232

- The room automation panel series provides a 3-pole Phoenix connector for bi-directional serial communication.
- The unit can be controlled via a serial port or it can send serial messages to control devices with standard RS-232 port (e.g. third-party or Lightware devices).



The signal levels are the following:

	Output voltage (V)
Logic low level	3 – 15
Logic high level	-15 – 3

RS-232 connector and plug pin assignment

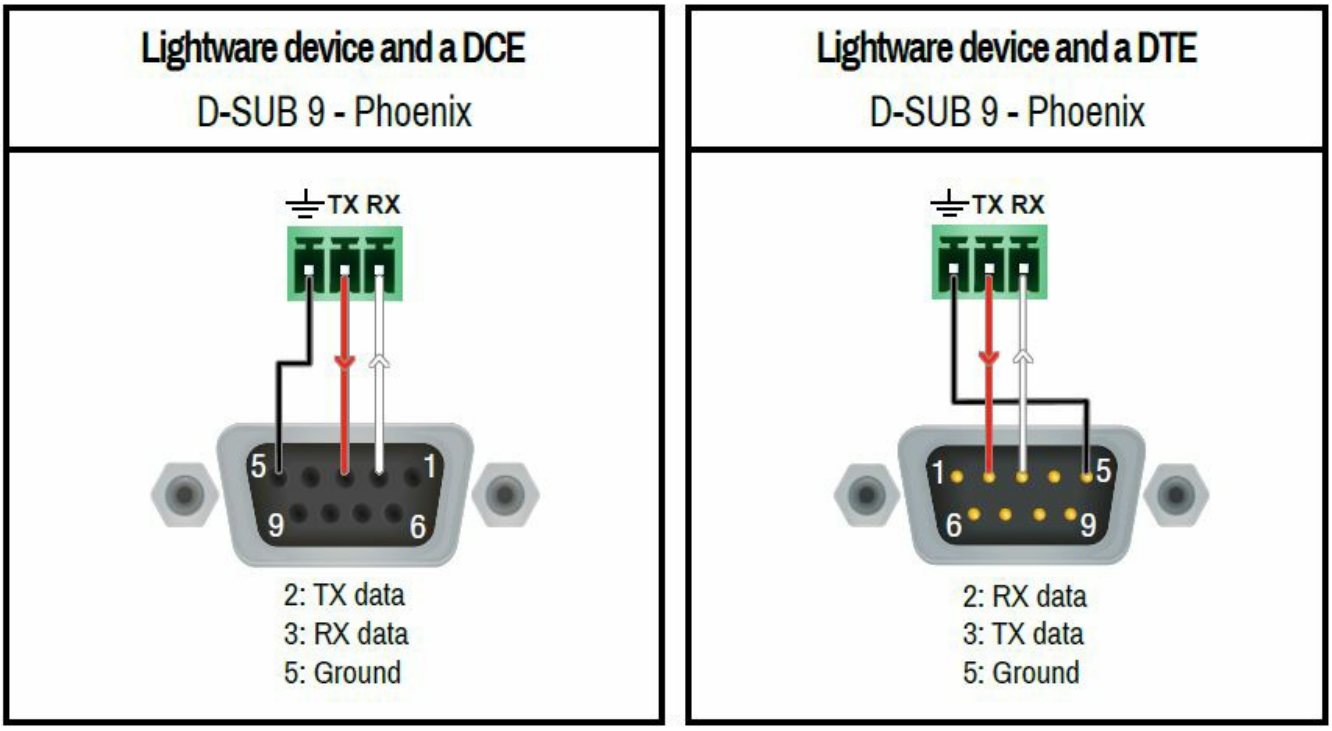
Pin nr.	**Signal**
1	Ground
2	TX data
3	RX data

The RAP-B511 series works as a DCE unit according to its pin-out.

Wiring Guide

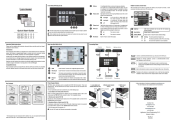
Wiring Guide for RS-232 Data Transmission

- RAP-B511 series are 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:



For more information about the cable wiring see the user's manual of the device or Cable Wiring Guide on our website www.lightware.com.

Documents / Resources

	LIGHTWARE RAP-B511-EU-K Room Automation Panel [pdf] User Guide RAP-B511-EU-K, RAP-B511-W, RAP-B511-S, RAP-B511-UK-K, RAP-B511-US-K, RAP-B511-EU-K Room Automation Panel, RAP-B511-EU-K, Room Automation Panel, Automation Panel, Panel

References

- Lightware Visual Engineering
- Lightware Visual Engineering
- User Manual