

LIGHT HUB



Gateway luminaire control

DS-450002-03

DESCRIPTION

The LIGHT HUB is the device responsible to manage and control the communications from and towards a single LED Module or a group of LED modules if they contain the same number of colored channels. Multiple sub-groups are available if different lighting scenarios are foreseen.

The communication bus is RS485 allowing for high speed signals over long distances in serial connections.

Once the LIGHT HUB finds a new device (a LEDMOTIVE light source) it registers, and automatically assigns an address to this new device in order to govern it.

The LIGHT HUB is designed for indoor applications only (IP20).



Figure 1. LIGHT HUB picture

LIGHT HUB - Characteristics

- Able to control up to 128 luminaires with a single device.
- Fits in a rail DIN
- Communication bus protocol: TIA 485 (RS-485)
- RESTful API available
- Capable to connect to the Internet of Things (IoT LIGHTCREATOR® platform) using the Ethernet connection - Optional
- USB 2.0 host port, mini USB 2.0 client port, micro HDMI and micro SD card available.
- Ethernet 100 Mbit/s
- Wi-Fi available through USB dongle - Optional
- Easy to plug and play

LIGHT HUB ELECTRICAL SPECIFICATIONS

Nominal Input Voltage	5 V DC (Constant Voltage)
Max. Current Input	1 A
Input data	Ethernet RJ45
Output data	Pair of wires labeled A, B (bus RS 485)

The LIGHT HUB is provided with a power supply unit adaptor allowing 110-240V AC input power at 50/60Hz and output signal at 5V DC 2.4A (12 W max).

DIMENSIONS

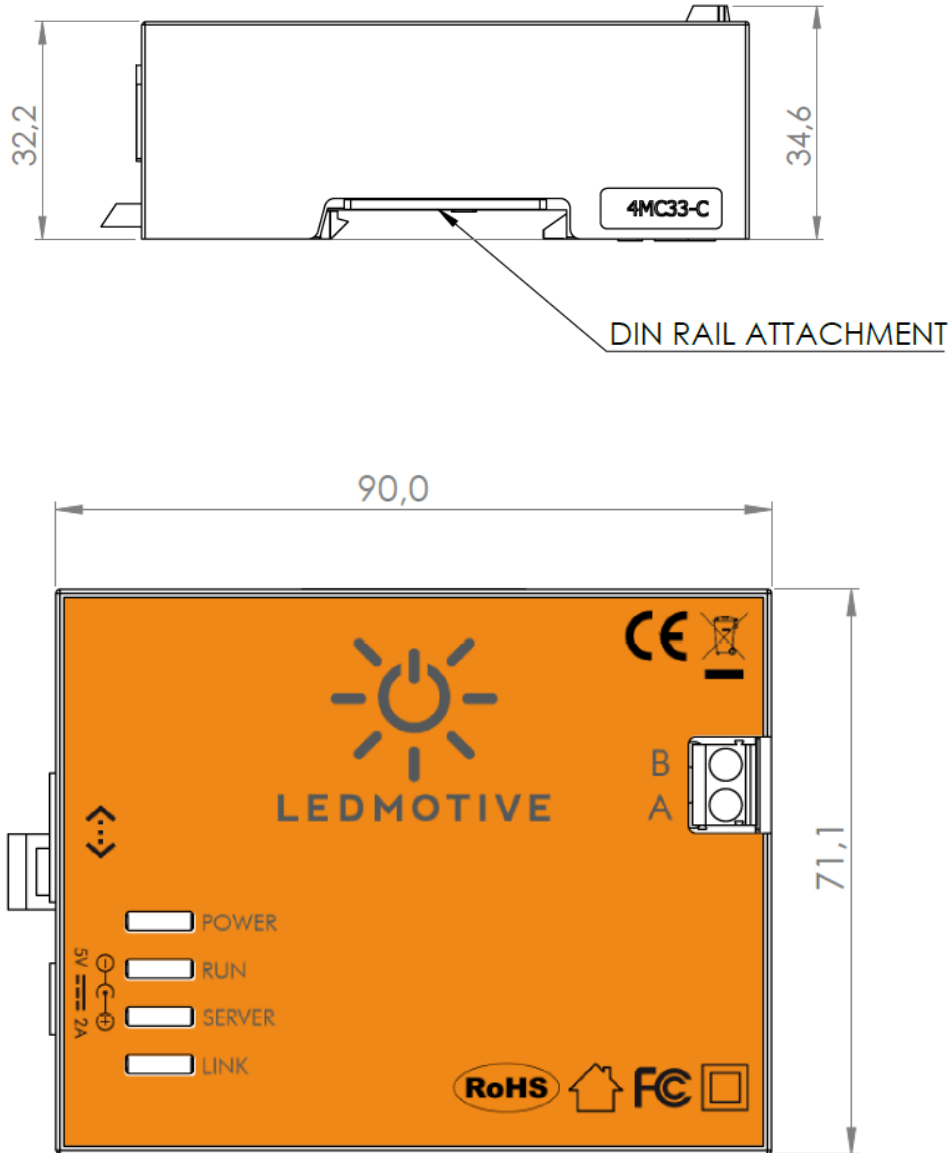


Figure 2. LIGHT HUB dimensions

RESTful API

When the LIGHT HUB is connected through an USB to a computer, a predefined IP will be assigned (192.168.7.2) otherwise if the LIGHT HUB is connected to the network using the ethernet plug, the IP will be defined by the network. The device can be discovered in the network through the standard DNS-SD (compatible with implementations like Bonjour, Zeroconf or Avahi) requesting for `_http_lighthub_tcp` services or the `lighthub.local` domain (since firmware version 1.4.9). Multiple LIGHT HUBs on the same network will add a suffix such as `lighthub-2.local`.

A RESTful API is available, so any user can make all the necessary queries to the LIGHT HUB IP address to send and receive commands to and from the luminaire/light source(s). HTTP responses from the LIGHT HUB are in JSON format and not bounded to any specific language (i.e.: JavaScript, Python, Matlab, C...). An encrypted HTTPS API is available on demand.

Some of the commands are the following:

- Execute a specific spectrum based on the amplitude of every channel
- Execute a specific spectrum based on the amplitude of every wavelength value (typically from 380 to 780 nm with a steps of 5 nm)
- Execute a specific color by passing the x, y color coordinates in the 1931 CIE color space
- Execute a blinking mode by passing the number of blinks per second
- Execute a turn on/off command
- Execute a dimming level
- Execute a spectral video
- Readout the current amplitude of every channel
- Readout the current spectrum
- Readout the temperature from different temperature sensors in the PCB board
- Readout the value of a spectral sensor embedded in the LED module
- Readout calibration curves from every channel.
- Readout device information properties
- Readout light properties (such as Ra, R9, CCT,...)
- Define a power limit control
- Define a temperature limit control
- Define a default spectrum to be executed every time the lights are switch on
- Define a group or luminaires through a multicast address
- And more...

There are up to 45 different commands to interact with the LIGHT HUB approximately. The RESTful API adds full flexibility for anyone with software programming skills to control and govern the lights at will. The license to develop against this API and its full documentation are provided as a separate product under request.

COMPUTER SECURITY CONSIDERATIONS

The LIGHT HUB is a small computer at its core. As such, you should consider security issues before connecting it to a local network. Talk with your network administrator about the connection policies that apply before wiring it to the network.

A Linux embedded operating system runs in the LIGHT HUB and manages the different processes required for the device operation. The system holds a number of services that might vary depending on the installation requirements. From those services the following offer open ports that allow connection from outside of the device:

- 8181 (TCP) – The LIGHT HUB API listens here. This is required for local control and configuration of the lighting system. Under requirement the device can be configured to listen requests coming from a single IP address only.
- 242 (TCP) – The SSH server listens here. This is required for remote maintenance, but it can be permanently disabled under requirement. If disabled technical assistance will have to relocate in-house for monitoring and support assistance. A banning system prevents brute force attacks to the SSH login.
- 53 (TCP/UDP)/67 (udp) – The private DNS and DHCP servers listen on these ports. They are required to allow connections to the LIGHT HUB through USB (generally used to connect a laptop directly to the device for control or maintenance). This service can be disabled under requirement if an USB connection is not required by the installation.
- 5353 (UDP) – mDNS (multicast DNS) messages are listened on this port for compatibility with DNS-SD (DNS based Service Discovery). This service allows dynamic discovery of the LIGHT HUB device in the network. This service can be disabled under request for installations where a static IP address is used for the device (i.e. the device does not rely on DHCP).

MAINTENANCE AND SERVICE

- The LIGHT HUB is intended for use in dry interiors only with IP20.
- It is not water resistant and must be protected from adverse weather conditions (hot and humid).
- To avoid damage, do not expose it to spray, liquids, dust, or chemical products.
- Do not open or manipulate the LIGHT HUB device

WARNING AND SAFETY

- All necessary measures must be taken to avoid electric shock when handling electrical and/or electronic equipment. In case of doubt disconnect the main power supply when handling lighting equipment.
- During normal operation, the casing can achieve high temperature, be careful on handling it to avoid burning.
- The LIGHT HUB must not be operated in explosive environments.
- All statements regarding safety of operation, warranty and technical data only apply when the unit is operated correctly according to its specifications.
- The safety of any system incorporating the equipment is the responsibility of the assembler of the system.

DISPOSAL

- In accordance with EU Directive WEEE (Waste Electrical and Electronic Equipment), must not be disposed of with another household waste.
- At the end of its life, the LIGHT HUB must be taken to the appropriate local facility available for the disposal or recycling of electronic parts.

WARRANTY

- This product has passed the EU regulations and directives.
- LEDMOTIVE offers a two-year limited warranty.

DISCLAIMER

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