Product Highlights

- Wireless communication on ISM band at 868 MHz [Europe]. Configurable for other regions.
- Encrypted communications by **AES 128bits**.
- Auto configurable.
- Modbus RTU wireless transmission.
- RS485 Modbus RTU transmission.
- Power Input: 100Vac ~ 230Vac 50/60HZ.
- Light Control: *DALI* or *Dimmer* (1 – 10V).
- Possibility to connect a presence sensor or a light sensor.
- Power cut off by relay.
- Power control up to 1600W.
- RRTC: Control and programming internal scheduler.
- Electric Failures Detection.

General Description

HL-108 is a Wireless lighting control module able to regulate the light intensity of lamps up to 1.6KW following two different interfaces: DALI protocol or Dimmer (1-10Vdc).
Also, it has an analog input for connecting either a presence sensor or a light sensor (depending the sensor, internal jumpers must be manipulated). In summary, HL-108 is capable to run autonomously with customer-preprogrammed parameters or manually through a MODBUS API installed in a PC or SCADA.
Functionality synthesis:

- RS485 Modbus-RTU transmission.
- Light Power controlled by a relay, up to 1600W.
- Dimmer Control (1-10Vdc). Output current up to 40mA, so it is capable to control several lamps in parallel.
- DALI protocol as master. Bus voltage 15.5Vdc.
- Current measurement to control electric failures and peaks to predict lamps failures.
- Internal scheduler to regulate power on/off, or dimming, of the attached luminaire, storing a maximum of 366 daily configurations, with up to 5 different programmable intervals each.
- Available sensor connection for a visible light sensor based on photodiode or a presence sensor, with dry output or open collector, to add more variables for the lamp autonomy.

Main Features

General
Power: 100Vac ~ 230Vac 50/60Hz
Consumption: < 4W

Radio

Frequency	868MHz
Sensibility	-104dBm typ
RF Power	Up to +26dBm
Direct Range	Up to 1km (antenna depending)
Antenna	External (SMA connector)

Wired Communications Interface
RS485: Bus range up to 1 km; Bauds range: 2,4Kbps to 19,2 Kbps

Lighting Control Interfaces
Dimmer: 1 – 10 Vdc @ 40mA
DALI: Master @ 15,5Vdc

Wired Protocol
Modbus RTU

Wireless Security
AES 128bits Encryption

Configurable Sensor Input. Two options:
- Visible light sensor based on photodiode.
- Presence sensor with dry output or open collector.

Net Topology
Coordinator < - > Endpoints
Auto routing
Maximum jumps between endpoints: **up to 5**
Maximum HL-108 in the same net: **50**

Working Conditions

Working temperature:	-25 .. +85°C
Storage temperature:	-40 .. +85°C
Humidity range:	5 – 95%, without condensation

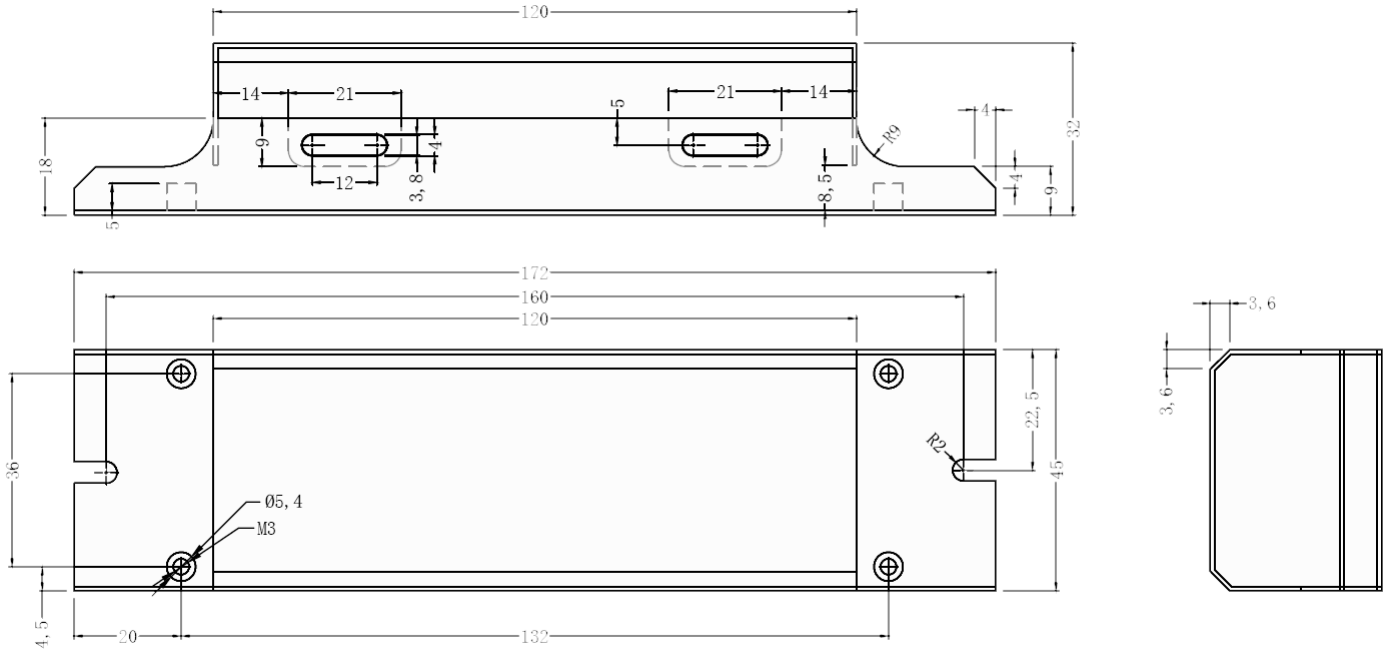
Verified Certifications
UNE-EN 60950-1:2007 +Corr:2007+A11:2009+A1:2011 +A12:2011/AC2012(Partial)
UNE-EN 61000-3-2:2006+A1:2010+A2:2010
UNE-EN 61000-6-1:2007
UNE-EN 61000-6-3:2007
UNE-EN 55015:2007+A1:2008+A2:2009
UNE-EN 55 022:2011 + Err (UNE-EN55022:2011/AC)
UNE-EN 55 024:2011

Mechanical

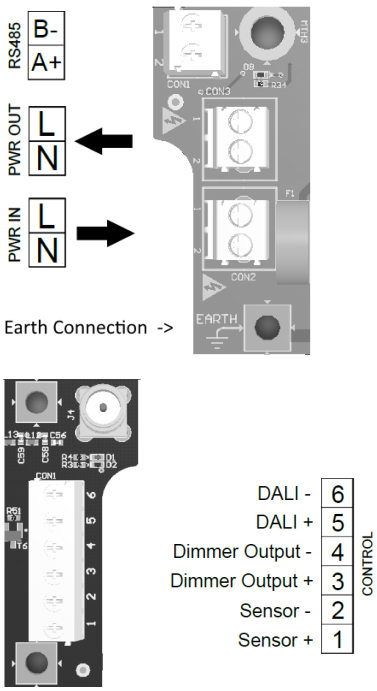
Dimensions:	172x45x32 mm
Material:	Aluminum
IP rating:	IP20

Other
Made in EU

Dimensions



Connections



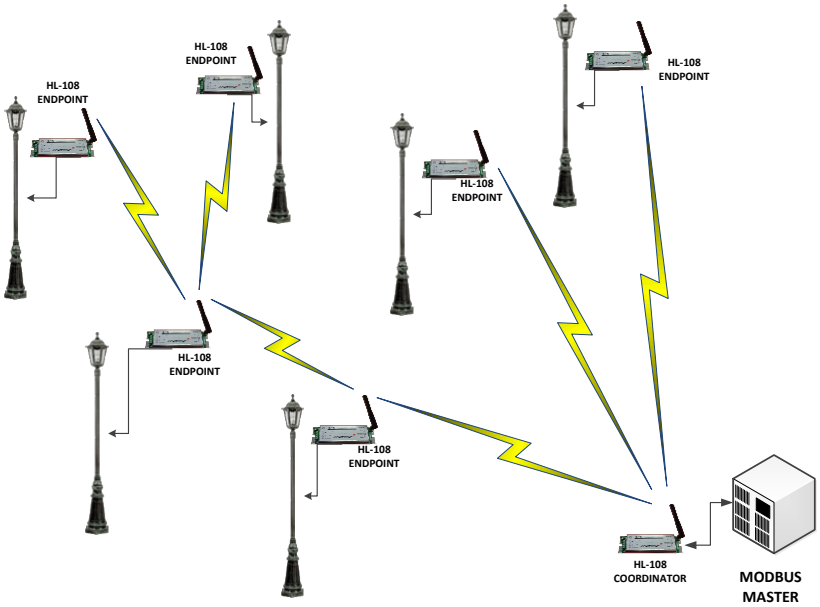
Connections description

B-	Terminal B RS485.
A+	Terminal A RS485.
L PWR OUT	AC Power line output through lamp
N PWR OUT	AC Power neutral output through lamp
L PWR IN	AC Power line input
N PWR IN	AC Power neutral input
DALI -	DALI negative terminal
DALI +	DALI positive terminal
Dimmer Output -	Dimmer negative terminal [1 – 10V]
Dimmer Output +	Dimmer positive terminal [1 – 10V]
Sensor -	Sensor negative terminal.
Sensor +	Sensor positive terminal.

Theory of Operation

Grouping a number of HL-108 devices, customer can easily implement a remote public lighting management system which regulates wirelessly the light intensity or the power up and power off dates and times, individually or collectively.
Although control system can be implemented through a wire connection by using Modbus RTU on RS485 and Dali, HL-108 solves all the issues related to the wiring infrastructure by enhancing maintenance and operation through a wireless set up. Compatibility with Wireless Mesh Network protocol used by the wireless bridge of ADVANTICSYS DM-108 is provided.
Integrating any of the ADVANTICSYS controllers with a DM-108 module, configured as Coordinator, is an easy task. It ends up into a hybrid wireless/wired Modbus control system for a group of lamps. It is also possible to connect directly to a controller a HL-108 module using the RS485 port, so in this case it will not be necessary to add a DM-108 bridge. Of course, this HL-108 must be configured as Coordinator, which it would be the bridge between the customer API and the lamps.
In addition, the mounted system is completely compatible with ADVANTICSYS software **CONCORDIA**. This tool permits control, monitoring, maintenance and data logging of any lightning network that has been created. Concordia can be loaded as web page so, with a public net or private net, all the data and variables can be collected and managed in the cloud.

System topology:



The structure is simple: wireless control packets are transmitted up to 5 hops-distances with one net coordinator (in this case, a DM-108) so it can reach up to 5 kilometers.

Configuration

It is possible to configure the HL-108, using the RS485 port and the software tool *WM Config Tool,* downloadable from ADVANTICSYS webpage (www.advanticsys.com).
The configurable parameters are:

Port RS485	UART Parameters: BPS, Stop bits, Parity, N data
Channel Radio	RF Channel: 0 to 9
RF Power	RF Transmission Power: 15dBm to 27dBm
ID radio	ID radio: 258 to 65280
ID Modbus	ID Modbus: 1 to 247
Coordinator Function	Select the HL-108 role: Endpoint or Coordinator
Group ID	Group ID for the managing of different nets in the same location: 0 to 255
Lightning Control Type	Selection of dimmer 1 – 10V or DALI protocol
Type of sensor connected	Light sensor, presence sensor or neither of them.
Operating Mode	Selection of one of the five operation modes of HL-108
Ballast type	Selection of the light interface control: DALI, Dimmer or both.
Dimmer Light Intensity	Percentage level for Dimmer output.
DALI Light Intensity	Percentage level for lights via DALI.
Relay	Relay Activation or deactivation.
Connected sensor	The connected sensor: light sensor or presence sensor.
Presence sensor active period	Timeout in minutes after the sensor presence has been activated.
AES Enabled	The AES 128bits encryption enabled for Wireless communication.
ACK Enabled	Enabling acknowledges between wireless messages.
ACK Timeout	Timeout in milliseconds for consider a wireless message lost.
ACK retries	Number of transmission retries when there is an ACK fail.

Precautions

- Using DM108 as Wireless bridge, the maximum number of MODBUS registers to be **read/written** is 16. Thus, for example, if you need to read/write 25 registers, you must perform two orders.
- The interval of time between Modbus requests must not be lower than 2000ms.
- Installation and wiring must be made only by qualified personnel.
- Only one Coordinator can be configured within each net or group id.
- Remove power supply before connecting or disconnecting the input/output terminal blocks.
- Double-check connections and polarities before switching on the power supply to avoid permanent damages.

User's Manual

In the user's manual come all details of the functionality and configuration of the HL-108.

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