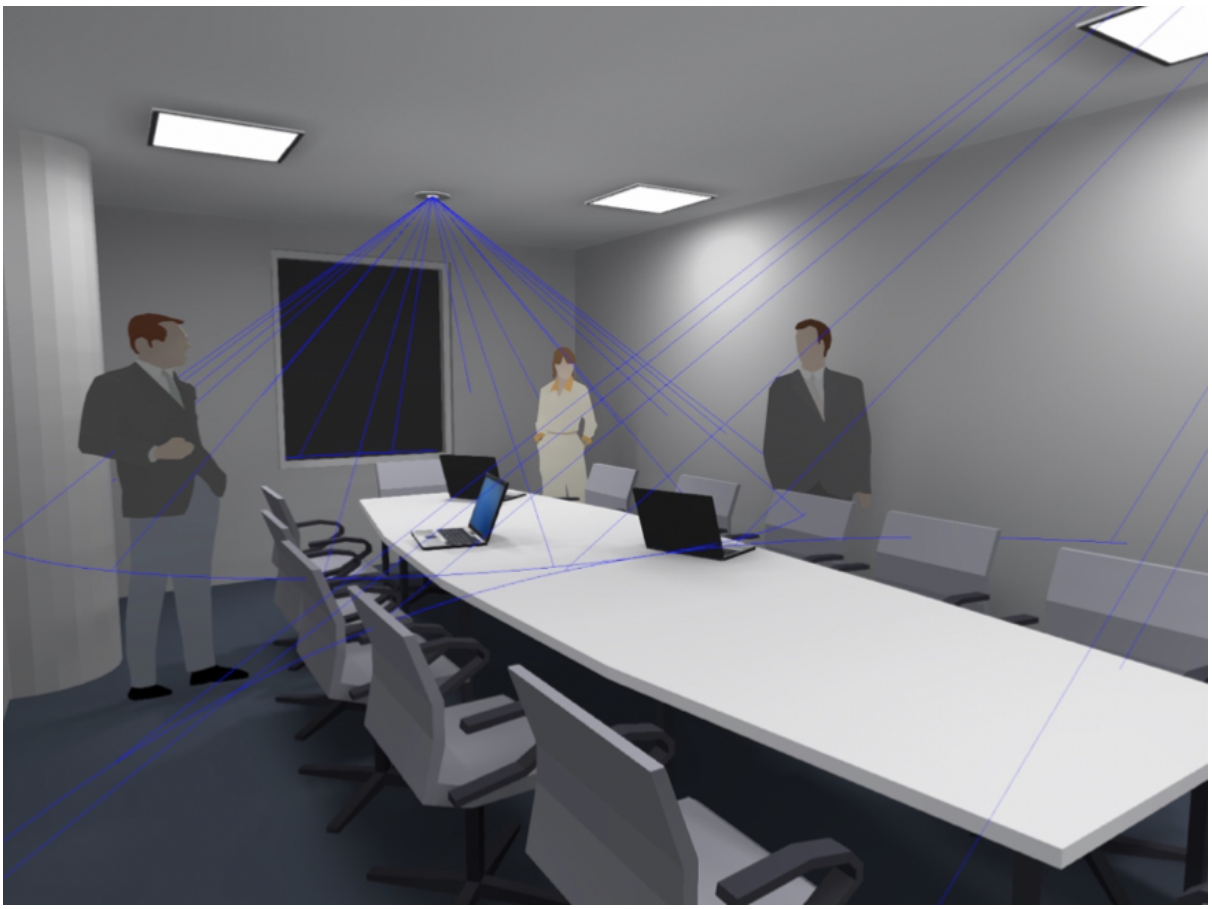
# LIFIMAX® TECHNICAL DOCUMENTATION



oledcomm

*BRIGHTLY REINVENTING THE WAY WE CONNECT*

20230414001-DATASHEET-LiFiMAX®SUITE


OLEDCOMM SAS - 10, avenue de l'Europe - 78140 Vélizy-Villacoublay-France
Siret : 74985413900013 - Naf : 4741Z - TAX : FR24749854139 - RCS Versailles B 749 854 13

# Table of contents

## *PRESENTATION OF THE LIFIMAX® SUITE*

1. The LiFiMAX® Access Point
2. The LiFiMAX® Photonic Antennas (83-degree opening angle) - which connect to the Access Point via a dedicated and provided RJ45 cable. A maximum of 6 Photonic Antennas can be connected per Access Point.
3. The USBC LiFiMAX® Dongle (or EP - end point) to connect user devices.
4. The LiFiMAX® Tablet that integrates both the functions of the Dongle and an additional battery providing 7-8 hours of battery life.
5. The LiFiMAX® Controller software is hosted in the Access Point.

LiFiMAX® products are currently going through the "**CSPN"** certification process, delivered by the French information system security agency, "**ANSSI"**.

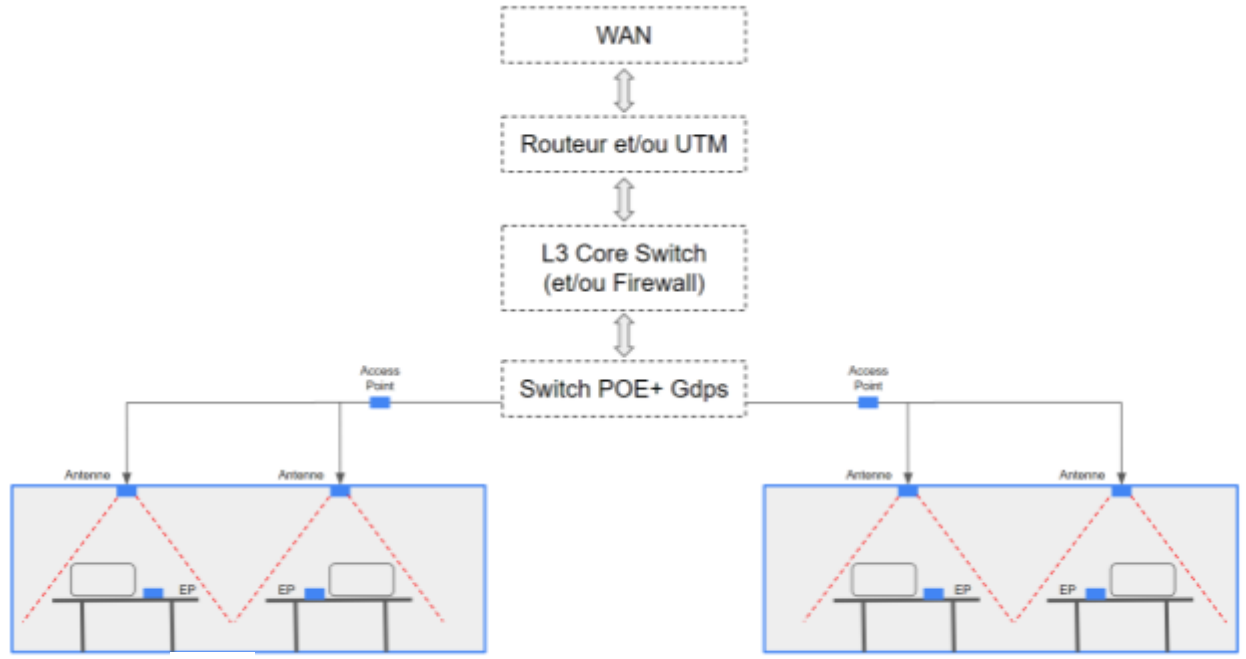



*Figure 1: scheme of a typical LiFiMAX® installation*

Each piece of equipment has a specific role which will be explained below.

## THE LIFIMAX® ACCESS POINT (AP)

The LiFiMAX® Access Point (AP) allows one user device to connect to an authorized LiFiMAX® Dongle or LiFiMAX® Tablet to access the network.

LiFi communication is based on the **ITU-T G.vlc (or G.9991)** international standard and is fully secure **802.1X authentication (with AES256 encryption)**, **captive portal** connection and **VLAN management at the Dongle**.

*Figure 2 LiFiMAX AP with its surface mounting accessory*


*Figure 3 LiFiMAX AP with its recessed mounting accessory*

The LiFiMAX® Access Point includes:

Port 1: A Power over Ethernet (**PoE+ 30W**, IEEE 802.3at standard) interface, in the form of an RJ45 connector, allowing it to be powered and data to be exchanged with the POE+ switch and therefore the network.
Port 4 to 9: 6 RJ45 interfaces allowing the connection of up to 6 Photonic Antennas.
Ports 2 and 3: 2 RJ45 connectors allowing synchronization between Access Points to extend the covered surface.

The LiFiMAX® AP itself does not emit or receive any LiFi optical signal.

It can be fixed to the ceiling in two different ways: like a smoke detector or directly embedded in a recessed ceiling with the accessories provided by Oledcomm.

The LiFiMAX® Access Point complies with the EC marking certifications, and the IEC/EN 62471 standard relating to photobiological safety. The LiFiMAX® Access Point is class 0 ("does not present any photobiological risk") and is also equipped with an automatic optical signal cut-off mechanism when the Photonic Antenna/Dongle link is broken (e.g., when a person looks closely and in the direction of the Photonic Antenna). The LiFiMAX® Access Point complies with the IEC/EN 61000 standard for electromagnetic compatibility (EMC). In addition, the wavelength used for LiFi communication is 940 nm (infrared), at which the spectrum of natural sunlight is at a low point and therefore interference from it is very low. The system is also protected from other light radiation by a powerful optical filtering system, making it less sensitive to natural and artificial light interference.

Link to the complete datasheet

## *THE LIFIMAX® PHOTONIC ANTENNA (APh)*

The LiFiMAX® Photonic Antenna (APh), connected to the LiFiMAX® Access Point allows one user device to connect to an authorized Dongle to access the network. A maximum of 6 Photonic Antennas can be connected per Access Point. Specific cables between AP and APh are provided to connect them**. It is imperative to use these cables (blue cables, 6m length).**

LiFi communication is based on the **ITU-T G.vlc (or G.9991)** international standard and is fully secure **802.1X authentication (with AES256 encryption)**, **captive portal** connection and **VLAN management at the dongle**.

Each Antenna has a Field of view of 83 degrees, using a 940 nm wavelength light source.

*Figure 4 - Picture of the photonic antenna with the surface (left) and recessed (right) mounting accessories.*

It can be fixed to the ceiling in two different ways: like a smoke detector or directly embedded in a false ceiling with the accessories provided by Oledcomm.

The LiFiMAX Photonic Antenna complies with the CE mark certifications, and the IEC/EN 62471 standard relating to photobiological safety. The LiFiMAX® Access Point is class 0 ("does not present any photobiological risk") and is also equipped with an automatic optical signal cut-off mechanism when the Photonic Antenna/Dongle link is broken (e.g., when a person looks closely and in the direction of the Photonic Antenna). The LiFiMAX® Access Point complies with the IEC/EN 61000 standard for electromagnetic compatibility (EMC). In addition, the wavelength used for LiFi communication is 940 nm (infrared), at which the spectrum of natural sunlight is at a low point and therefore interference from it is very low. The system is also protected from other light radiation by a powerful optical filtering system, making it less sensitive to natural and artificial light interference.

Link to the complete datasheet

## *TYPICAL INSTALLATION IN A WORKING SPACE*

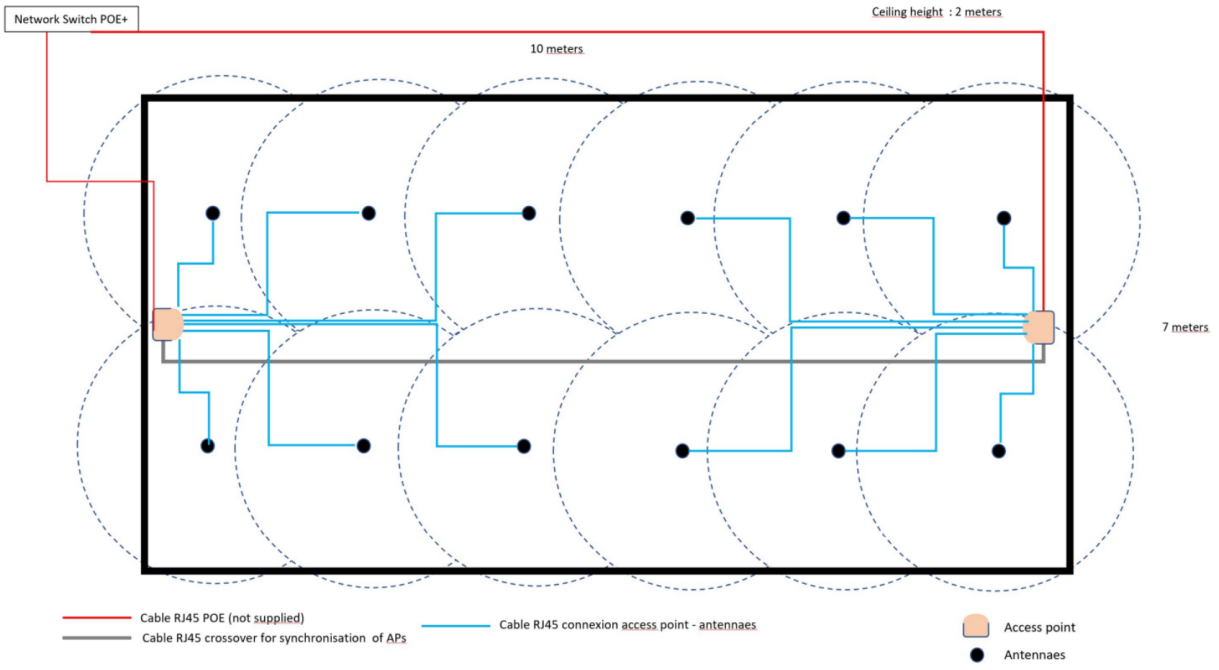



*Figure 5: Surface 70m2 - L 10m x l 7m x 2m*

Important notes:

APs can be synchronized to extend the covered surface. Synchronization can be done two by two of three by three, allowing two handover options:

- Dynamic handover: the bandwidth is divided automatically according to users' needs.
- Static handover: the flow is divided between the APs (Eg: 215/2 = approx. 107,5 Mbps per AP OR 215/3 = approx. 72 Mbps per AP). This option allows a faster reconnection time, approx. 2-3 seconds

Within the framework of its offers, Oledcomm offers and carries out coverage studies to determine the number of APs and APhs required according to the characteristics of the space to be equipped (length, width, useful height). At the end of this study, an implementation plan will allow the installer to install the equipment precisely and therefore allow a homogeneous and efficient coverage of the equipped space.

*See the image below for a better visualization of a coverage study example :*

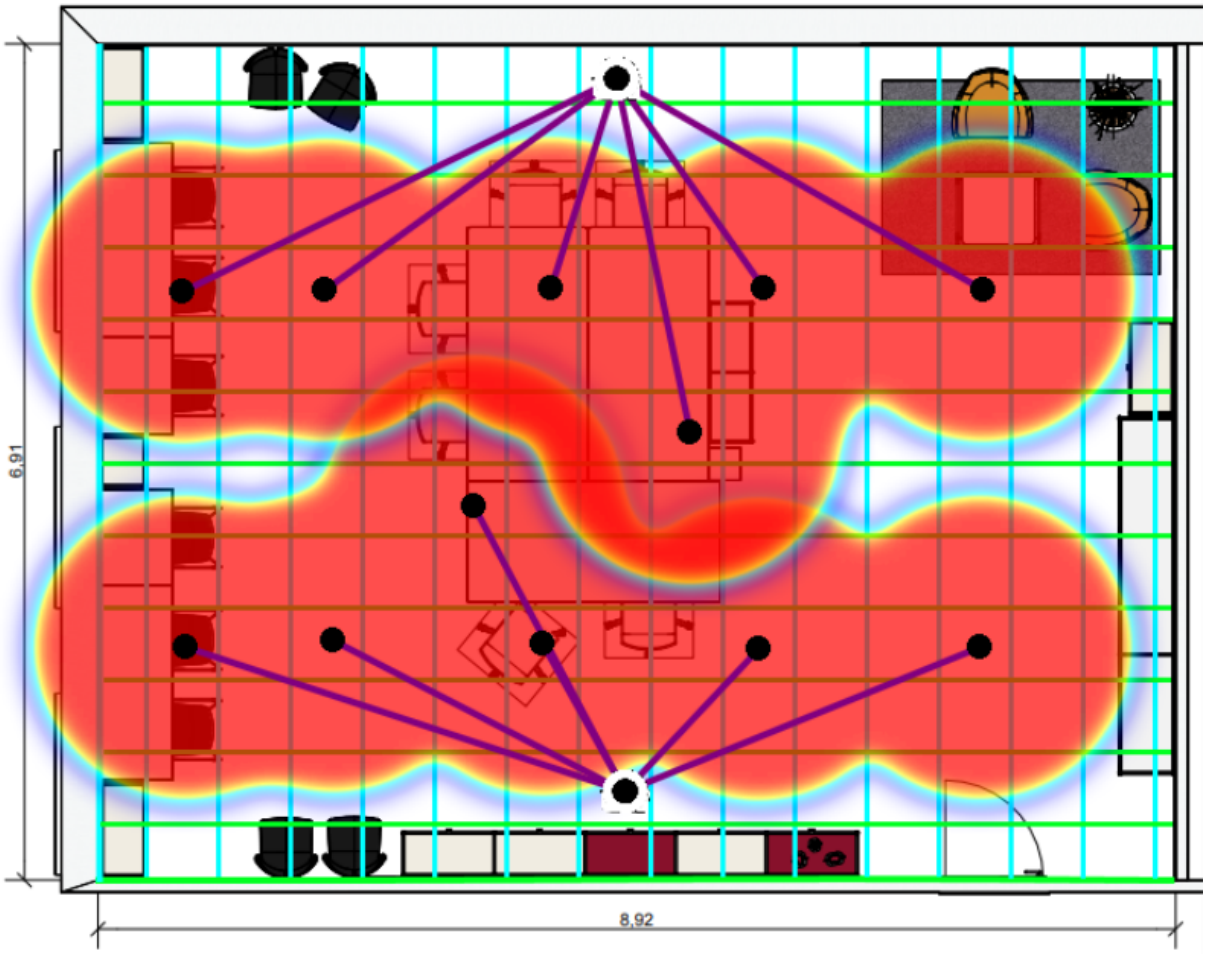



*Figure 5: Workspace LiFi coverage study example*

## *THE LIFIMAX® END POINTS*

### The LiFIMAX® Dongle stick

The LiFiMAX® Dongle enables the user equipment to which it is connected to support LiFi data transmission. If the dongle connected to the user equipment is placed in the coverage area of a Photonic Antennas, the user will be able to enjoy a secure, radio frequency-free connection.

*Figure 6: LiFiMAX® Dongle Stick*

*Figure 7: LiFiMAX® Dongle case*

The LiFiMAX® Dongle is compatible with Windows (7 and later), MacOS, Linux for computers, Android for smartphones and tablets with a USB-C connector. It is compatible with Ipad pro and recent Ipad because they have a USB-C port.

It is completely plug-and-play and therefore requires no driver software installation or configuration from the user.

As the Access Point, the LiFiMAX® Dongle complies with the EC marking certifications.

The IEC/EN 62471 standard for photobiological safety. The LiFiMAX® Dongle is class 0 ("does not present any photobiological risk") and is also equipped with an automatic optical signal cut-off mechanism when the Photonic Antenna/dongle link is broken (e.g., when a person looks closely at the Dongle in the axis).

The IEC/EN 61000 standard for electromagnetic compatibility.

Furthermore, the wavelength used for LiFi communication is 940 nm (infrared), at which the spectrum of natural sunlight is at a low point and therefore interference from it is very low. The system is also protected from other light radiation by a powerful optical filtering system, making it almost insensitive to natural and artificial light interference.

The LiFiMAX Dongles are delivered in a dongle case which greatly reduces the risk of being forgotten or lost.

[Link to the complete datasheet]

## The LiFIMAX Android Tablet

*Figure 8: LiFiMAX® Tablet*

When the LiFiMAX® tablet is placed in the coverage area of a Photonic Antennas, the user will be able to benefit from a LiFi connection.

The LiFiMAX® tablet complies with the EC marking certifications.

The IEC/EN 62471 standard for photobiological safety. The LiFiMAX® shell is class 0 ("does not present any photobiological risk") and is also equipped with an automatic optical signal cut-off mechanism when the Photonic Antenna/Tablet link is broken (e.g. when a person is looking closely and in line).

The IEC/EN 61000 standard for electromagnetic compatibility.

In addition, the wavelength used for LiFi communication is 940 nm (infrared), at which the spectrum of natural sunlight is at a low point and therefore interference from it is very low. The system is also protected from other light radiation by a powerful optical filtering system, making it robust to natural and artificial light interference.

[Link to the complete datasheet]

## The LiFIMAX Android and IOS tablet cases

This LiFiMAX® case enables your iOS and Android tablets to be compliant with LiFi data transmission. When the tablet equipped with the shell is placed in the coverage area of one of the Photonic Antennas, the user will be able to benefit from a high speed, secure and radio frequency free LiFi connection. Equipped with an additional battery, it provides a full day of autonomy.

*Figure 9: LiFiMAX® Android Case*

*Figure 10: LiFiMAX® IOS Case*

The LiFiMAX® tablet case complies with the EC marking certifications. The IEC/EN 62471 standard for photobiological safety. The LiFiMAX® Case is class 0 ("does not present any photobiological risk") and is also equipped with an automatic optical signal cut-off mechanism when the Photonic Antenna/Case link is broken (e.g. when a person is looking closely and in line). The IEC/EN 61000 standard for electromagnetic compatibility.

In addition, the wavelength used for LiFi communication is 940 nm (infrared), at which the spectrum of natural sunlight is at a low point and therefore interference from it is very low. The system is also protected from other light radiation by a powerful optical filtering system, making it robust to natural and artificial light interference.

Link to the complete datasheet Android TABLET CASE

Link to the complete datasheet IOS TABLET CASE

## *THE LIFIMAX®Controller*

The LiFiMAX® Controller is at the heart of the LiFIMAX® suite.

It is a software application that interfaces the LiFiMAX® Access Points with the client's network, securing and managing them remotely, while providing additional connectivity features and administration tools to the network manager.

### Features offered by the LIFIMAX®CONTROLLER

Here is the roadmap for the next versions of the LiFiMAX®Controller.

**LiFiMAX®Controller v2.2.4: Available and included**

- Software upgrade and update module for the controller
- Security management (firmware encryption, ...)
- List of APs and their connection information, status, Mac address, ...
- List of EPs and connection information, status, Mac address, ...
- Management of admin accounts and passwords
- Fast handover module with dynamic bandwidth allocation
- 802.1X authentication management - VLANs at the end point
- Master/Slave APs management to facilitate admin.
- Enhanced security
- Reporting and Data Analytics module (syslog)
- Web services and API module
- Security update

***It is mandatory for the client to have a DCHP server.***

### Functioning schemes

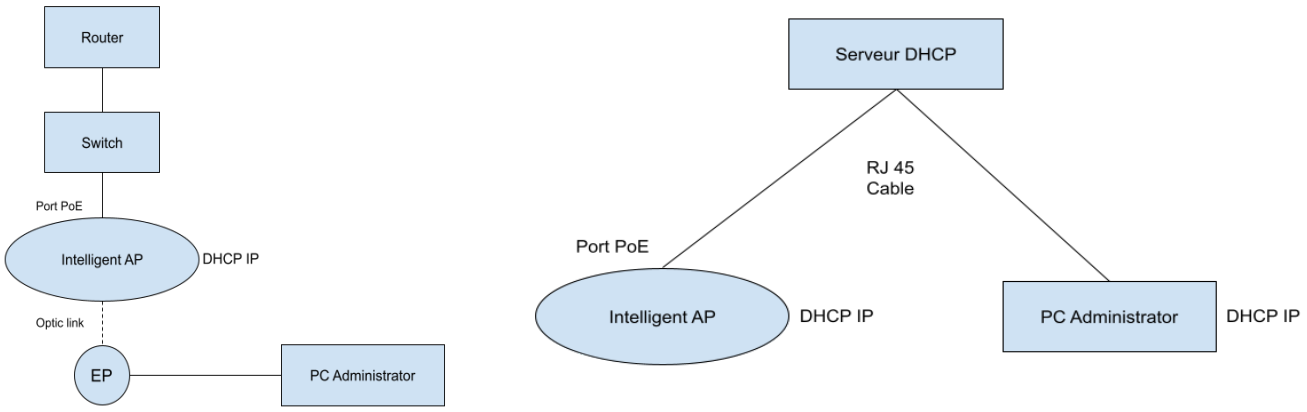



*Figure 11: Network functioning schemes*

## Graphical Interface

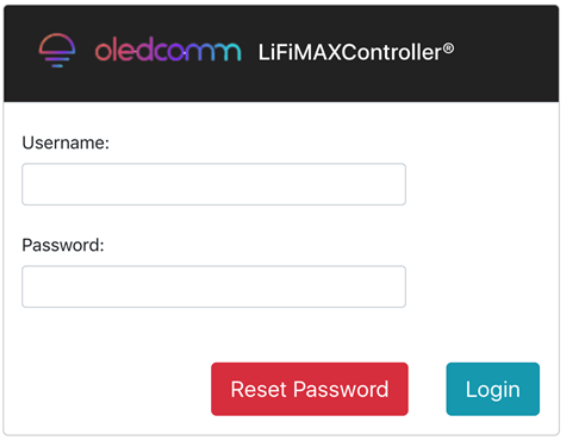



*Figure 12: LiFiMAX®Controller login interface*

## The "Dashboard" submenu

The submenu Dashboard is the first page of the LiFi module and gives information about the connected user, the system's version and the product's legal mentions.

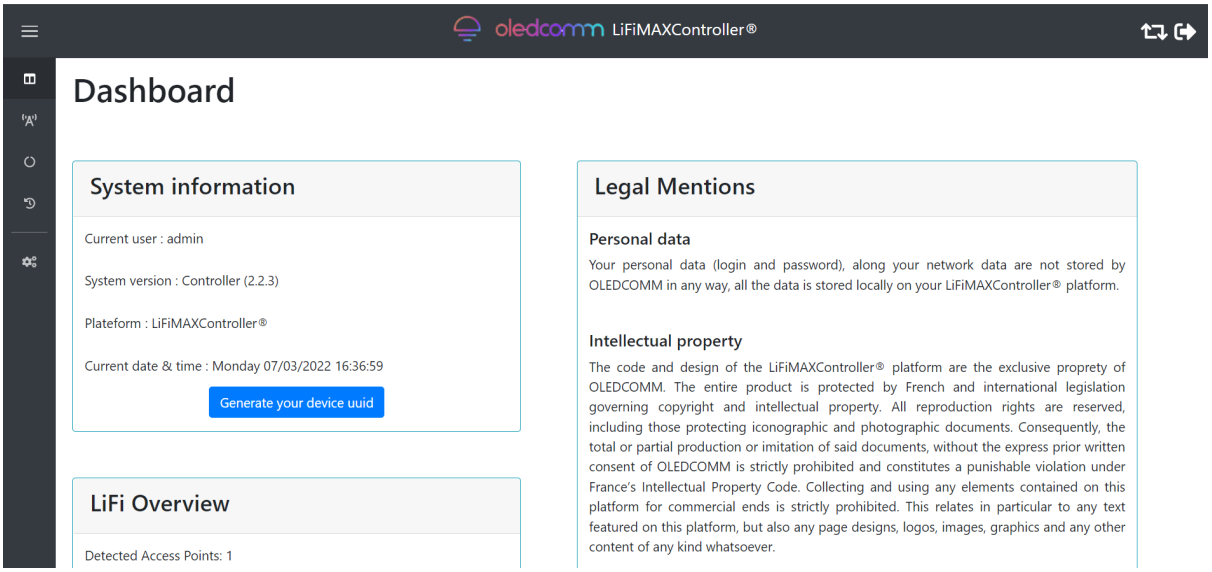



*Figure 13: LiFiMAX®Controller dashboard*

## The “Access-Points List” submenu

The Access-Points submenu allows you to manage your LiFi Access Points, it provides information about the devices’ state (UP or DOWN), the devices’ mac addresses and the devices’ given names (by default the devices have no name but can be renamed at any time).

The Access-Points submenu allows you to undergo actions on your LiFi access point device such as: rebooting the device, getting information (Up time and firmware version) and renaming your device.

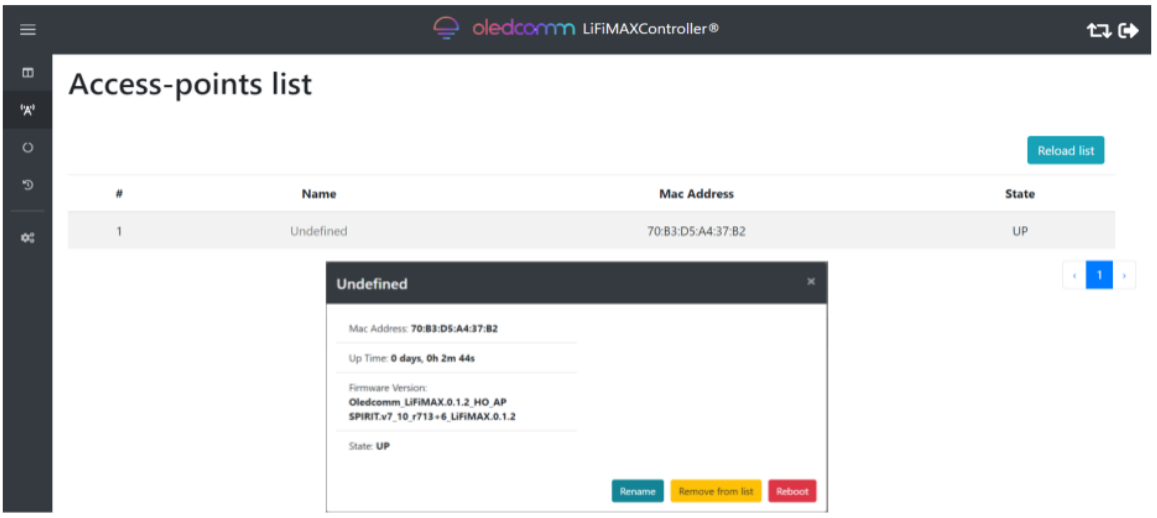



*Figure 14: LiFiMAX®Controller dashboard*

## The “End-Points List” submenu

The End-Points submenu allows you to manage your LiFi end points, it provides information about the devices’ state (UP or DOWN), the device’s mac address, the devices’ IP addresses and the devices’ given names (by default the device has no name but you can rename it at any moment), it also indicates the mac address and name of the access point to which the end points are connected.

The End-Points submenu allows you to undergo actions on your LiFi end point devices such as: Rebooting the devices, getting information (Up time and firmware version) and renaming your devices.

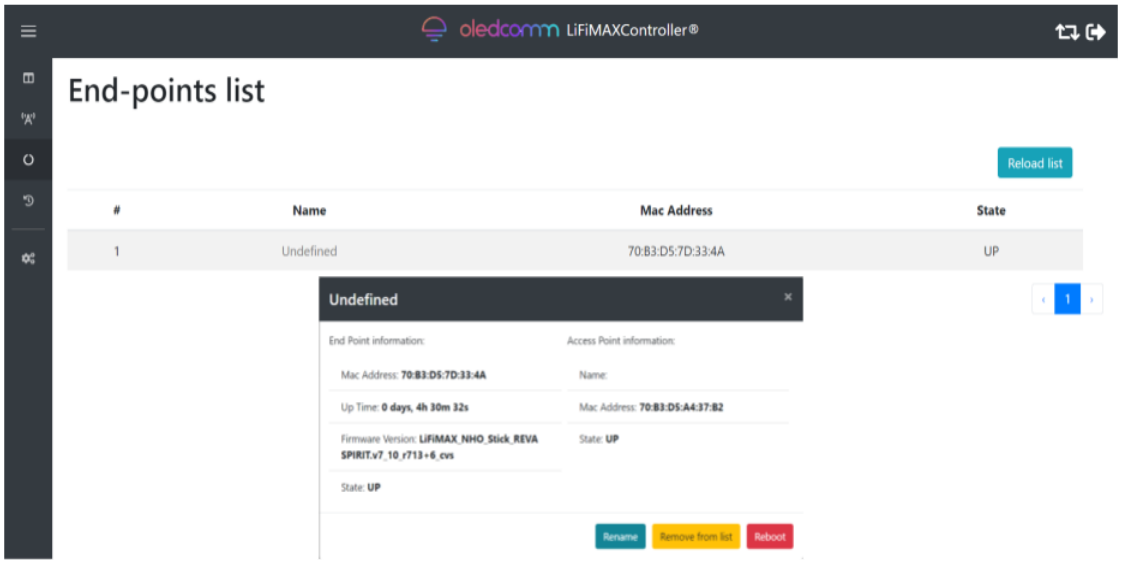



*Figure 15: LiFiMAX®Controller "End-Points List" submenu*

## Details on Access-Points and End-Points common options

**Reload List:** This button allows you to reload the devices' list to check any change in the devices' states or to refresh the devices' list. This operation may take a few seconds, depending on the number of LiFi devices in the network.

**Reboot:** This button allows you to reboot your device remotely, when you click on the button a popup will appear 1 to 2 seconds later to indicate if the device has been rebooted successfully or if an error occurred. You then can check if it is UP again by reloading the list.

**Rename:** This button allows you to rename your device or give it a name if it is a new device.

**Infos:** This button allows you to get information about the device such as its uptime (since when the device has been up) and its firmware version (following OLEDCOMM versioning norms).

## Advanced network configurations

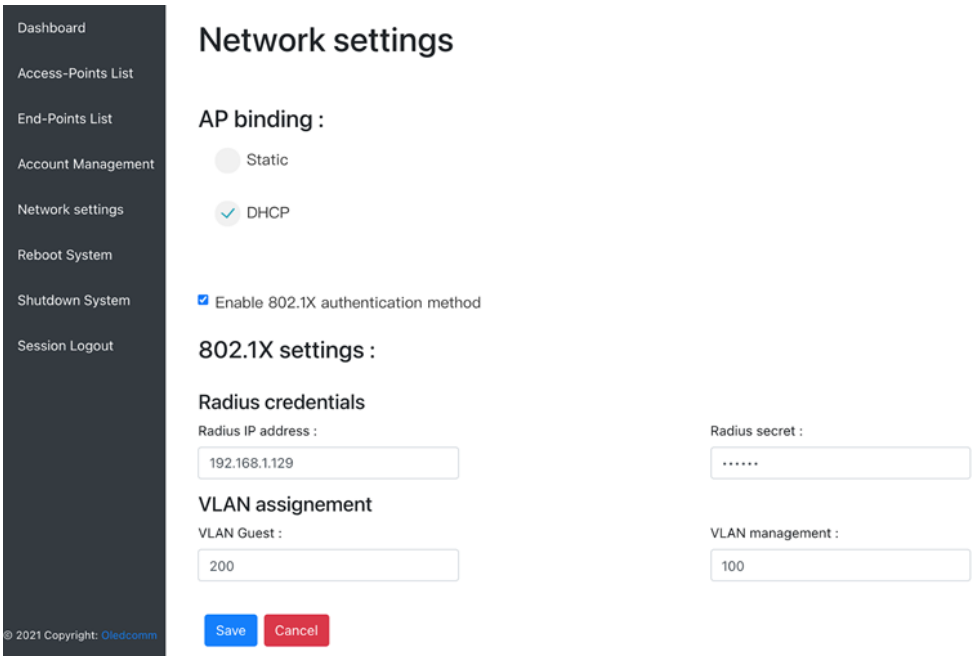



*Figure 16: LiFiMAX®Controller advanced network settings*

## *EC COMPLIANCE DECLARATION*

SAS Oledcomm
2020,
10/12 Avenue de l'Europe
78140 Velizy Villacoublay
Siret: 749 854 139

Vélizy-Villacoublay, March 29th,

Subject: European Commission Compliance Declaration

I, Benjamin Azoulay, hereby certify that all products belonging to the LiFiMAX range comply with the European Commission's electrical security, electromagnetic compatibility and photobiological safety norms, viz. RoHS, IEC/EN 61000 norms (electromagnetic compatibility), and IEC/EN 62471 (ocular safety)

Benjamin Azoulay
CEO - Oledcomm

OLEDCOMM SAS
Centre Technologique de Vélizy
10-12 Avenue de l'Europe
78140 Velizy Villacoublay
Tél. : 01 39 25 47 57
www.oledcomm.com

*LiFiMAX® Datasheets*

## Access Point LiFiMAX®

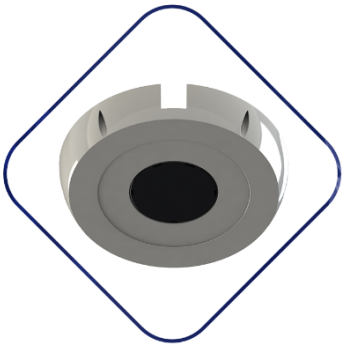
# LiFiMAX® Access Point

**TxRx-LFMX-1AP-RevF**

### LiFi ACCESS POINT RevF

The Access Point is the heart of the LiFiMAX® suite, it also hosts the LiFiMAXController. It allows up to 16 users to connect in LiFi to the broadband network.

Connected to the existing PoE+ network, it broadcasts data through dedicated cables to up to 6 Photonic Antennas (TxRX-LFMX-1APh-RevF) that establish the optical link with the receivers. Several Access Points can be connected to extend the coverage area.

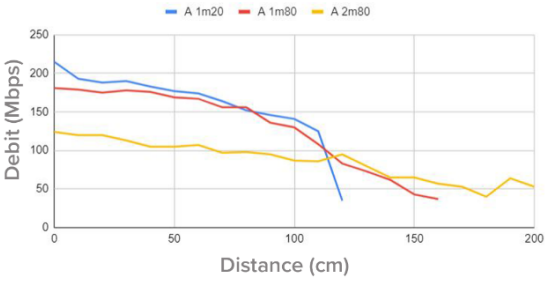


**Access Point**
with its flush mounting accessory

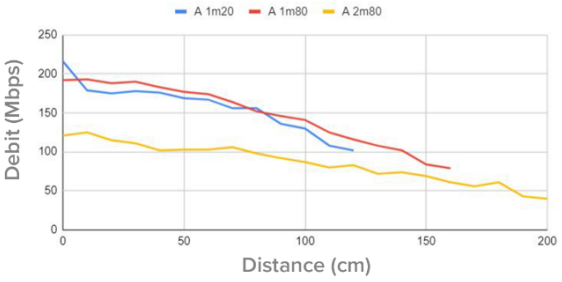
| CARACTERISTICS | VALUES |
|---|---|
| Dimensions | 13,7cm x 12,5cm x 3,2cm |
| Weight | 261 g |
| Tolerated humidity | 70% (RH) |
| Average ambient temperature | +/- 25° C |
| Storage temperature | -40° to +100° Celsius |
| Operating temperature range | 0° to +70° Celsius |
| Transmission mode | Half duplex |
| Protection class | IP30 |
| Interfaces | PoE (IEEE 802.3af/at/PD) thus plug-and-play |
| Connectivity | 9 RJ45 ports :<br>- 1 RJ45 cat 5 minimum for data and power<br>- 6 RJ45 cat 7 to connect the TxRx-LFMX-APh-RevF Photonic Antennas (TIA/EIA 568A or 568B)<br>- 2 RJ45 cat 5 minimum for synchronization between Access Points (Ethernet crossover TIA/EIA 568B) |

| CARACTERISTICS | VALUES |
|---|---|
| Installation | Plug-and-play |
| Optical technology | LED 940 nm (close to infrared) |
| LiFi communication standard | ITU-T G-9991 |
| Security | AES 128 encryption, 802.1X, VLANs, Captive portal via the LiFiMAXController® |
| Connection continuity | Provided under the same TxRx-LFMX-1AP-RevF and its Photonic Antennas and between Access Points (roaming) with the LiFiMAXController®. A specific synchronization cable must be used. |
| Total flow | 215 Mbps up/down in Phy layer (G.vlc) |
| Power consumption | 802.3af (12.95 W) & 802.3at PoE standards (25,5 W). With 6 antennas it must be POE+ powered (30W) |
| Alimentation | 48V nominal (PoE, PoE+ standard) |
| Certifications | EC marking including RoHS, IEC/EN 61000 (EMC) and IEC/EN 62471 (eye safety) standards, IEC 60825-1, IEC 60825-12 |
| Mounting | Hidden or surface mounted |
| Maximum number of users | 16 users maximum per Access Point and its antennas |

Graph of Phy **uplink** data rate between the Photonic Antenna and the LiFiMAX® receiver according to distance

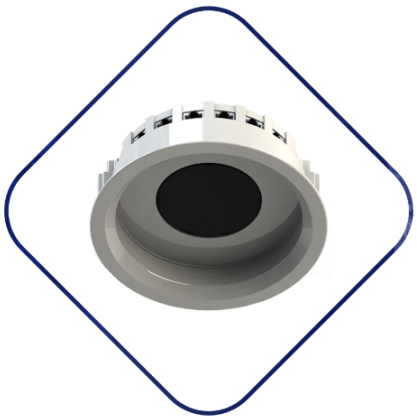



Graph of Phy **downlink** data rate between the Photonic Antenna and the LiFiMAX® receiver according to distance



# LiFiMAX® Access Point

**TxRx-LFMX-1AP-RevF**



**Access Point**
with its surface mounting accessory

## Some figures

| CARACTERISTICS |
|---|
| 215 Mbps download |
| 215 Mbps upload |
| 90° opening angle |
| **MEASUREMENT CONDITIONS (1)** |
| 120cm between the Photonic Antenna and the receiver |
| Receiver right below the Photonic Antenna (0° angle) |
| Only one receiver connected to the Access Point by one Photonic Antenna |
| Phy flow measurement |

(1) The distance between the Photonic Antenna and the receiver must be greater than 60cm to avoid saturation effects.

| OPERATING DISTANCE AND COVERAGE AREA | | | |
|---|---|---|---|
| Operating distance between the receiver and the Photonic Antenna | 1m20 | 1m80 | 2m80 |
| Radius of the coverage area between the receiver and the Photonic Antenna | 120cm | 160cm | 200cm |
| Coverage angle of the Photonic Antenna | 90° | 83° | 71° |

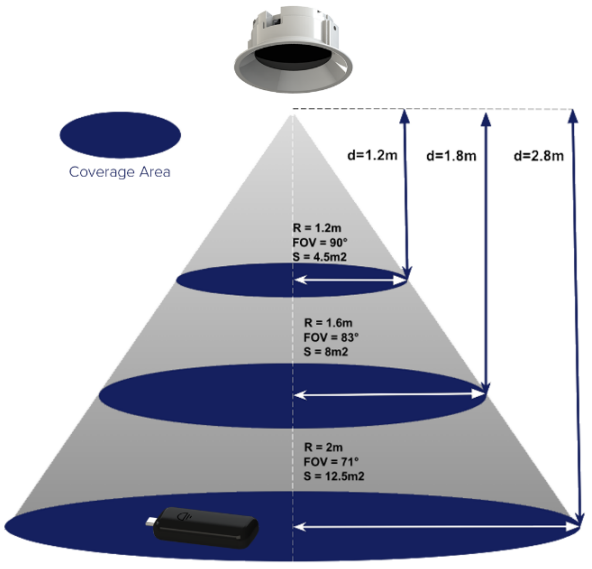



Figure 1 : coverage area

## LiFiMAX Photonic Antenna®

# LiFiMAX® Photonic Antenna

**TxRx-LFMX-1APh-RevF**

### LiFi PHOTONIC ANTENNA TO CONNECT WITH THE RevF ACCESS POINT

The Photonic Antenna repeats the signal transmitted by the Access Point (TxRx-LFMX-1AP-RevF) and defines the surface on which the LiFi network can be established. The area covered by LiFi depends on the number of connected antennas.

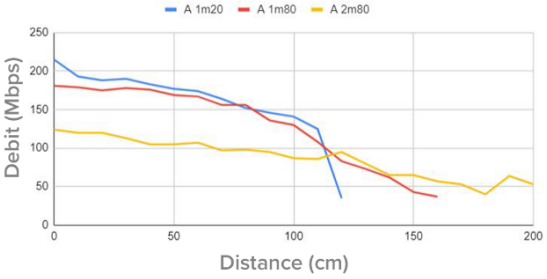
It diffuses a light field with a wavelength of 940nm invisible to the naked eye and interacts with the receivers as soon as an optical link is possible.

**Photonic Antenna**
with its flush mounting accessory

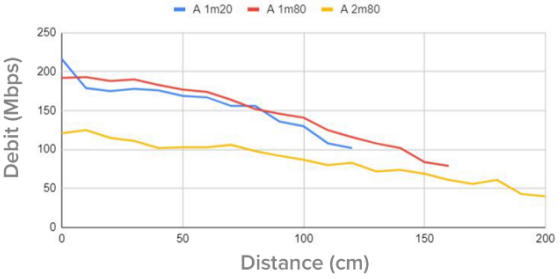
| CARACTERISTICS | VALUES |
|---|---|
| Dimensions | Ø 71 mm / height 28 mm |
| Weight | 80 g |
| Tolerated humidity | 70% RH |
| Average ambient temperature | +/- 25° C |
| Storage temperature | -40° to +100° Celsius |
| Operating temperature range | -25° to 85° Celsius |
| Transmission mode | Half duplex |
| Protection class | IP30 |
| Interfaces | 1 single RJ45 cat 7 connector (TIA/EIA 568A or 568B) towards the Tx-Rx-LFMX-1AP-RevF. It is strongly recommended to use Oledcomm cables |
| Installation | Plug-and-play |

| CARACTERISTICS | VALUES |
|---|---|
| Optical technology | LED 940 nm (near infrared) |
| LiFi communication standard | ITU-T G-9991 |
| Security | AES 128 encryption, 802.1X, VLANs, Captive portal via the LiFiMAXController® |
| Connection continuity | Ensured under a single Tx-Rx-LFMX-1AP-RevF and its antennas and between Access Points |
| Total flow | 215 Mbps uplink in Phy layer (G.vlc)<br>215 Mbps downlink in Phy layer (G.vlc) |
| Power consumption | 3W provided by the Tx-Rx-LFMX-1AP-RevF |
| Alimentation | 24V DC powered by the Tx-Rx-LFMX-1AP-RevF |
| Certifications | EC marking including RoHS, IEC/EN 61000 (EMC) and IEC/EN 62471 (eye safety) standards, IEC 60825-1, IEC 60825-12 |
| Mounting | Surface or flush mount type |

Graph of Phy **uplink** data rate between the Photonic Antenna and the LiFiMAX® receiver according to distance




Graph of Phy **downlink** data rate between the Photonic Antenna and the LiFiMAX® receiver according to distance



# LiFiMAX® Photonic Antenna

**TxRx-LFMX-1APh-RevF**

**Photonic Antenna**
with its surface mounting accessory

## Some figures

| CARACTERISTICS |
|---|
| 215 Mbps download |
| 215 Mbps upload |
| 90° opening angle |
| **MEASUREMENT CONDITIONS (1)** |
| 120cm between the Photonic Antenna and the stick |
| Stick below the Photonic Antenna (0° angle) |
| One Stick connected to the Photonic Antenna |
| Phy flow measurement |

(1) The distance between the Photonic Antenna and the receiver must be greater than 60cm to avoid saturation effects.

| OPERATING DISTANCE AND COVERAGE AREA | | | |
|---|---|---|---|
| Operating distance between the dongle and the Photonic Antenna | 1m20 | 1m80 | 2m80 |
| Radius of the coverage area between the dongle and the Photonic Antenna | 120cm | 160cm | 200cm |
| Coverage angle of the Photonic Antenna | 90° | 83° | 71° |

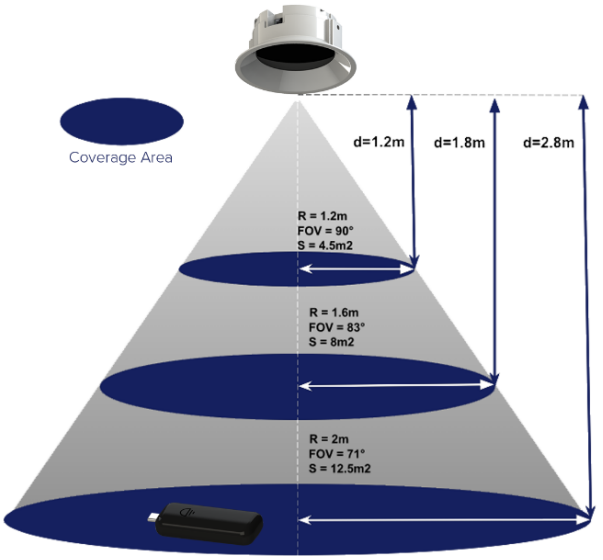



**Figure 1 : coverage area**

## LiFiMAX Dongle®

# LiFiMAX® Dongle Stick

**TxRx-LFMX-1EPSTCK-RevF**

### DONGLE LiFi – END POINT LiFiMAX®

The LiFiMAX® dongle allows the device to which it is connected to enjoy a LiFi connection. Once the dongle is placed in the coverage area of one of the Photonic Antennas (TxRx-LFMX-1APh-RevF), then the user will be able to enjoy a high speed, secure and radio frequency-free connection.

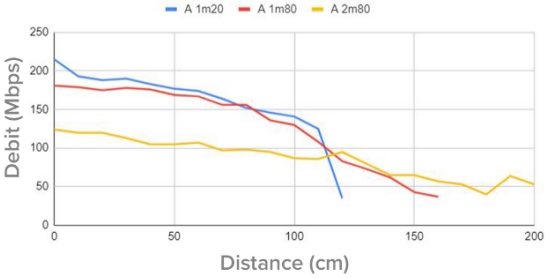
A maximum of 16 receivers can be connected simultaneously to the same Access Point (TxRx-LFMX-1AP-RevF).

LiFiMAX® **Dongle Stick**

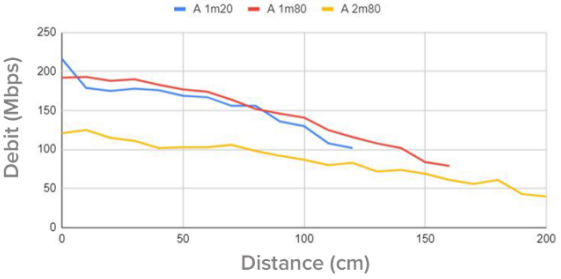
| CARACTERISTICS | VALUES |
|---|---|
| Dimensions | 74 x 28 x 15 mm |
| Weight | 40 g |
| Tolerated humidity | 70% RH |
| Average ambient temperature | +/- 25° C |
| Storage temperature | -40° to +100° Celsius |
| Operating temperature range | -25° to 85° Celsius |
| Transmission mode | Half duplex |
| Protection class | IP30 |
| Interfaces | Interfaces USB 2.0 or USB 3.0 |
| Installation | Plug-and-play |

| CARACTERISTICS | VALUES |
|---|---|
| Optical technology | LED 940 nm (near infrared) |
| LiFi communication standard | ITU-T G-9991 |
| Security | AES 128 encryption, 802.1X, VLANs, Captive portal via the LIFIMAXController® |
| Connection continuity | Provided under the same TxRx-LFMX-1AP-RevF and its Photonic Antennas and between Access Points (roaming) with the LiFiMAXController® |
| Total flow | 215 Mbps uplink in Phy layer (G.vlc)<br>215 Mbps downlink in Phy layer (G.vlc) |
| Power consumption | Maximum 3W, average 2,1W<br><1.7W without LiFi connection |
| Alimentation | USB standard |
| Certifications | EC marking including RoHS, IEC/EN 61000 (EMC) and IEC/EN 62471 (eye safety) standards, IEC 60825-1, IEC 60825-12 |
| OS Compatibility | **Plug and play**, Windows (from 7), MacOS, Linux, Unix, Android, Ipad pro. |

Graph of Phy **uplink** data rate between the Photonic Antenna and the LiFiMAX® Dongle Stick according to distance




Graph of Phy **downlink** data rate between the Photonic Antenna and the LiFiMAX® Dongle Stick according to distance



# LiFiMAX® Dongle Stick

**TxRx-LFMX-1EPSTCK-RevF**

LiFiMAX® **Dongle Stick**

## Some figures

| CARACTERISTICS |
|---|
| 215 Mbps download |
| 215 Mbps upload |
| 90° opening angle |
| **MEASUREMENT CONDITIONS (1)** |
| 120cm between the Photonic Antenna and the receiver |
| Receiver right below the Photonic Antenna (0° angle) |
| Only one receiver connected to the Access Point by one Photonic Antenna |
| Phy flow measurement |

(1) The distance between the Photonic Antenna and the receiver must be greater than 60cm to avoid saturation effects.

| OPERATING DISTANCE AND COVERAGE AREA | | | |
|---|---|---|---|
| Operating distance between the receiver and the Photonic Antenna | 1m20 | 1m80 | 2m80 |
| Radius of the coverage area between the receiver and the Photonic Antenna | 120cm | 160cm | 200cm |
| Coverage angle of the Photonic Antenna | 90° | 83° | 71° |

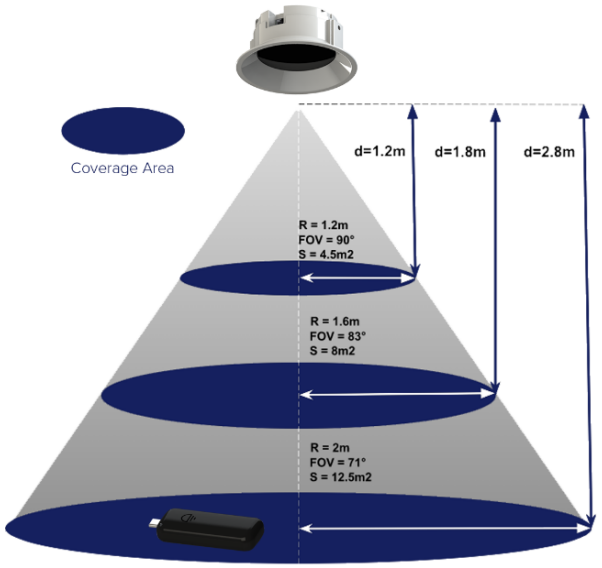



**Figure 1 : coverage area**

## LiFiMAX Tablet®

# LiFiMAXTab® Android Tablet

**TxRx-LFMX-1TAB**

### Android tablet with natively integrated LiFi

The LiFiMAXTab® tablet consists of an Android tablet and an integrated case that allows it to receive LiFi data. Thus, if the tablet is placed in the coverage area of one of the Photonic Antennas (TxRx-LFMX-1APh-RevF), then the user will be able to benefit from a high speed, secure and radio frequency free LiFi connection.

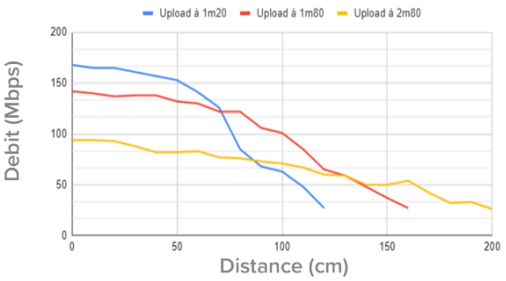
Equipped with an additional battery, it offers a full day of autonomy and has all the functionalities of a classic tablet (WiFi, Bluetooth, etc.).

LiFiMAXTab®
Android Tablet

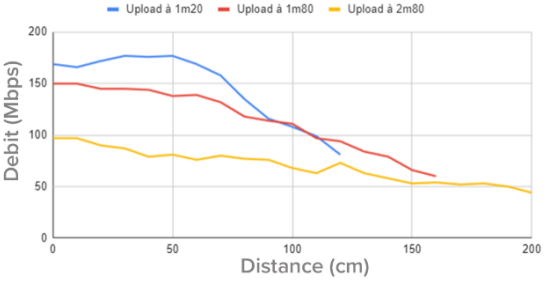
| CARACTERISTICS | VALUES |
|---|---|
| Optical technology | LED 940 nm (near infrared) |
| LiFi communication standard | ITU-T G.vlc |
| Dimensions | 28,15cm x 20,9 cm x 3,8 cm |
| Weight | 1225 g |
| Tolerated humidity | 70% RH |
| Average ambient temperature | +/- 25° C |
| Storage temperature | -40° to +100° Celsius |
| Operating temperature range | 0° to +70° Celsius |
| Transmission mode | Half duplex |
| Security | AES 128 encryption, 802.1X, VLANs, Captive portal via the LiFiMAXController® |
| Total flow | 215 Mbps uplink in Phy layer (G.vlc)<br>215 Mbps downlink in Phy layer (G.vlc) |
| Power consumption | < 1,7W for LiFi |
| Alimentation | Battery charging via included power adapter (USB-C) |
| Certifications | EC marking including RoHS, IEC/EN 61000 (EMC) and IEC/EN 62471 (eye safety) standards, IEC 60825-1, IEC 60825-12 |
| Connection continuity | Provided under an Access Point and its Photonic Antennas and between Access Points (roaming) with the LiFiMAXController® |

| CARACTERISTICS | VALUES |
|---|---|
| Color | Blue |
| CPU | Mediatek MTK6762<br>Eight-core up to 2GHz |
| OS | Android |
| TP | G+P Capacitive Touch screen |
| Screen | 10,1'' 1920x1200 |
| FR/FLASH | 4Go/64Go |
| Speakers | Built-in speakers 2x1W |
| Connectivity | 1 port USB-C + 2 ports SIM + 3.5mm stereo jack + 1xTF cardreader |
| Case | High performance Silicone shell specifically designed by Oledcomm for Education uses |
| Battery | 8000mAh - 6 to 7 hours of autonomy (in internet surfing use) + additional 6000mAh LiFi battery |
| WiFi Network | WIFI LAN 802.11A/b/g/n |
| Installation | Support:<br>GSM/EDGE (850/900/1800/1900MHz) /WCDMA/HSPA+(900/1900/2100 MHz)4+3<br>SCDMA: (B34/B39)<br>LTE-TDD:(B38/B39/B40/B41)<br>LTE-FDD:(B1/B2/B3/B4/B5/B7/B8/B17/B20/B28) |
| GPS | Yes |
| Bluetooth | BT4.2, FM |

Graph of Phy **upink** data rate between the Photonic Antenna and LiFiMAXTab® according to distance




Graph of Phy **downlink** data rate between the Photonic Antenna and LiFiMAXTab® according to distance



# LiFiMAXTab® Android Tablet

**TxRx-LFMX-1TAB**

LiFiMAXTab®
Android Tablet

## Some figures

| CARACTERISTICS |
|---|
| 215 Mbps download |
| 215 Mbps upload |
| 90° opening angle |
| **MEASUREMENT CONDITIONS (1)** |
| 120cm between the Photonic Antenna and the receiver |
| Receiver right below the Photonic Antenna (0° angle) |
| Only one receiver connected to the Access Point by one Photonic Antenna |
| Phy flow measurement |

(1) The distance between the Photonic Antenna and the receiver must be greater than 60cm to avoid saturation effects.

| OPERATING DISTANCE AND COVERAGE AREA | | | |
|---|---|---|---|
| Operating distance between the receiver and the Photonic Antenna | 1m20 | 1m80 | 2m80 |
| Radius of the coverage area between the receiver and the Photonic Antenna | 120cm | 160cm | 200cm |
| Coverage angle of the Photonic Antenna | 90° | 83° | 71° |

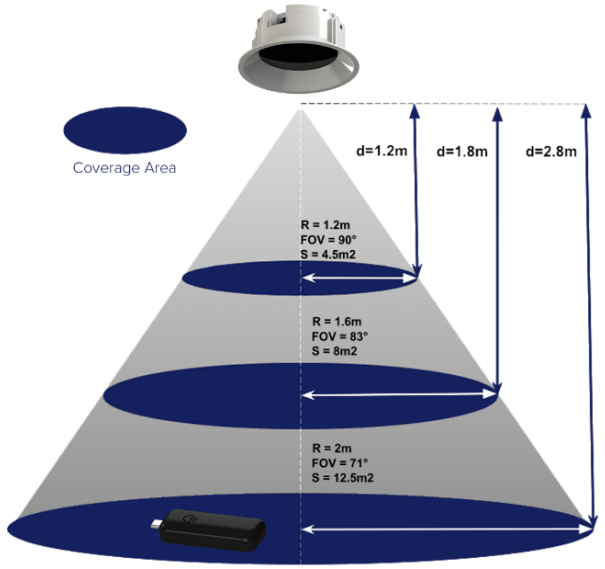



Figure 1 : coverage area

## LiFiMAX Android Case®

# LiFiMAX® Android Case

**TxRx-LFMX-CASE-AND**

This LiFiMAX® case enables your Android tablet to be compliant with LiFi data transmission. Thus, if the tablet connected to the user equipment is placed in the coverage area of one of the Photonic Antennas (TxRx-LFMX-1APh-RevF), then the user will be able to benefit from a high speed, secure and radio frequency free LiFi connection.

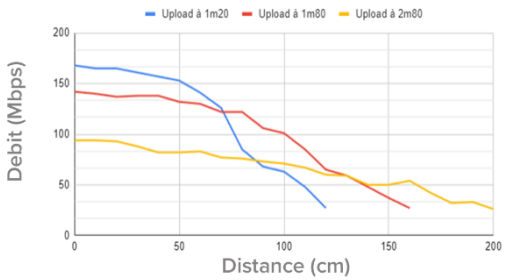
Equipped with an additional battery, it provides a full day of autonomy.

LiFiMAX®
Android Case

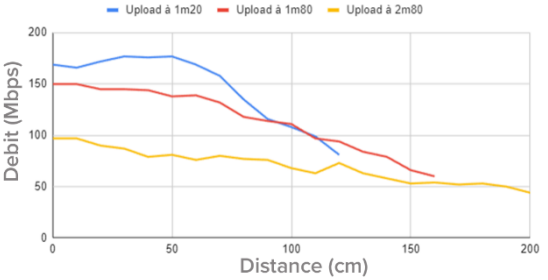
| CARACTERISTICS | VALUES |
|---|---|
| Color | White or black |
| Connectivity | The case plugs into the USBC port of the tablet |
| Tolerated humidity | 70% RH |
| Average ambiant temperature | +/- 25° C |
| Storage temperature | -40° to +100° Celsius |
| Operating temperature range | 0° to +70° Celsius |
| Transmission mode | Half duplex |
| OS Compatibility | Android |
| Protection mode | IP30 |

| CARACTERISTICS | VALUES |
|---|---|
| Installation | Plug & play |
| Optical technology | LED 940 nm (near infrared) |
| LiFi communication standard | ITU-T G-9991 |
| Security | AES 128 encryption, 802.1X, VLANs, Captive portal via the LiFiMAXController® |
| Connection continuity | Provided under an Access Point and its Photonic Antennas and between Access Points (roaming) with the LiFiMAXController® |
| Total flow | 215 Mbps uplink in Phy layer (G.vlc)<br>215 Mbps downlink in Phy layer (G.vlc) |
| Power consumption | Maximum 3W, average 2.1W<br>< 1.7W without LiFi connection |
| Alimentation | 5V nominal |
| Certifications | EC marking including RoHS, IEC/EN 61000 (EMC) and IEC/EN 62471 (eye safety) standards, IEC 60825-1, IEC |

Graph of Phy **uplink** data rate between the Photonic Antenna and the LiFiMAX® Android Case according to distance

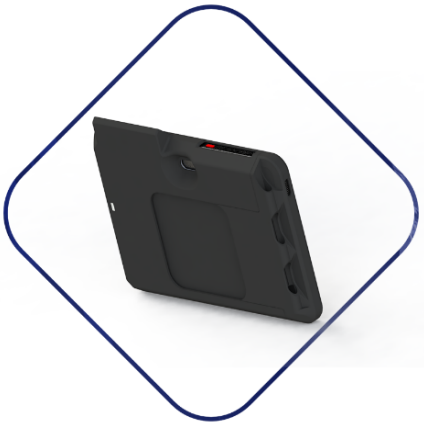



Graph of Phy **downlink** data rate between the Photonic Antenna and the LiFiMAX® Android Case according to distance



# LiFiMAX® Android Case

**TxRx-LFMX-CASE-AND**



LiFiMAX®
Android Case

## Some figures

| CARACTERISTICS |
|---|
| 215 Mbps download |
| 215 Mbps upload |
| 90° opening angle |
| **MEASUREMENT CONDITIONS (1)** |
| 120cm between the Photonic Antenna and the receiver |
| Receiver right below the Photonic Antenna (0° angle) |
| Only one receiver connected to the Access Point by one Photonic Antenna |
| Phy flow measurement |

(1) The distance between the Photonic Antenna and the receiver must be greater than 60cm to avoid saturation effects.

| OPERATING DISTANCE AND COVERAGE AREA | | | |
|---|---|---|---|
| Operating distance between the receiver and the Photonic Antenna | 1m20 | 1m80 | 2m80 |
| Radius of the coverage area between the receiver and the Photonic Antenna | 120cm | 160cm | 200cm |
| Coverage angle of the Photonic Antenna | 90° | 83° | 71° |

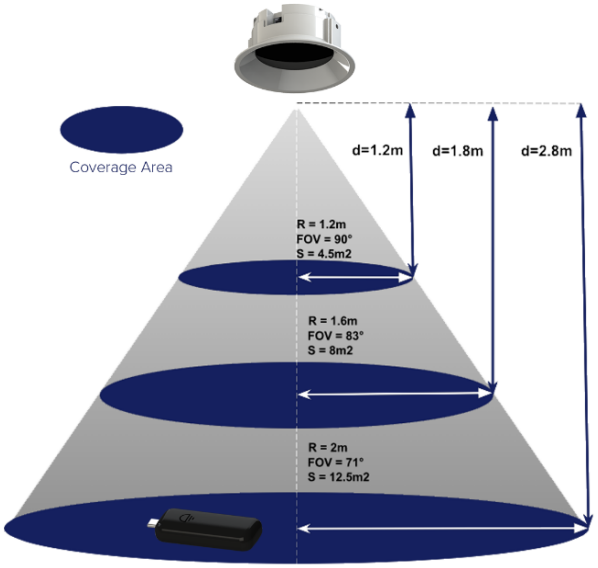



Figure 1 : coverage area

## LiFiMAX IOS Case®

# LiFiMAX® IOS Case

**TxRx-LFMX-CASE-IOS**

This LiFiMAX® shell enables your IOS tablet to be compliant with LiFi data transmission. Thus, if the tablet connected to the user equipment is placed in the coverage area of one of the Photonic Antennas (TxRx-LFMX-1APh-RevF), then the user will be able to benefit from a high speed, secure and radio frequency free LiFi connection.

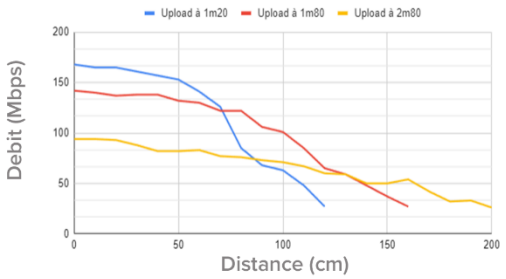
Equipped with an additional battery, it provides a full day of autonomy.

LiFiMAX®
**IOS Case**

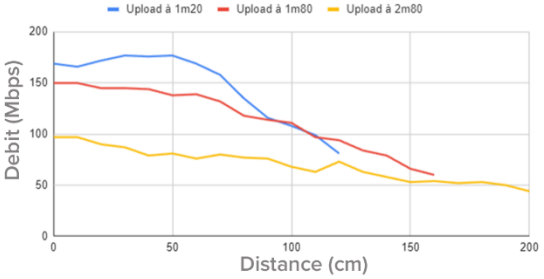
| CARACTERISTICS | VALUES |
|---|---|
| Color | White or black |
| Connectivity | The case plugs into the USBC port of the tablet |
| Tolerated humidity | 70% RH |
| Average ambiant temperature | +/- 25° C |
| Storage temperature | -40° to +100° Celsius |
| Operating temperature range | 0° to +70° Celsius |
| Transmission mode | Half duplex |
| OS Compatibility | IOS |
| Protection mode | IP30 |

| CARACTERISTICS | VALUES |
|---|---|
| Installation | Plug & play |
| Optical technology | LED 940 nm (near infrared) |
| LiFi communication standard | ITU-T G-9991 |
| Security | AES 128 encryption, 802.1X, VLANs, Captive portal via the LiFiMAXController® |
| Connection continuity | Provided under an Access Point and its Photonic Antennas and between Access Points (roaming) with the LiFiMAXController® |
| Total flow | 215 Mbps uplink in Phy layer (G.vlc)<br>215 Mbps downlink in Phy layer (G.vlc) |
| Power consumption | Maximum 3W, average 2.1W<br>< 1.7W without LiFi connection |
| Alimentation | 5V nominal |
| Certifications | EC marking including RoHS, IEC/EN 61000 (EMC) and IEC/EN 62471 (eye safety) standards, IEC 60825-1, IEC |

Graph of Phy **uplink** data rate between the Photonic Antenna and the LiFiMAX® IOS Case according to distance




Graph of Phy **downlink** data rate between the Photonic Antenna and the LiFiMAX® IOS Case according to distance



# LiFiMAX® IOS Case

**TxRx-LFMX-CASE-IOS**

LiFiMAX®
**IOS Case**

## Some figures

| CARACTERISTICS |
|---|
| 215 Mbps download |
| 215 Mbps upload |
| 90° opening angle |
| **MEASUREMENT CONDITIONS (1)** |
| 120cm between the Photonic Antenna and the receiver |
| Receiver right below the Photonic Antenna (0° angle) |
| Only one receiver connected to the Access Point by one Photonic Antenna |
| Phy flow measurement |

(1) The distance between the Photonic Antenna and the receiver must be greater than 60cm to avoid saturation effects.

| OPERATING DISTANCE AND COVERAGE AREA | | | |
|---|---|---|---|
| Operating distance between the receiver and the Photonic Antenna | 1m20 | 1m80 | 2m80 |
| Radius of the coverage area between the receiver and the Photonic Antenna | 120cm | 160cm | 200cm |
| Coverage angle of the Photonic Antenna | 90° | 83° | 71° |

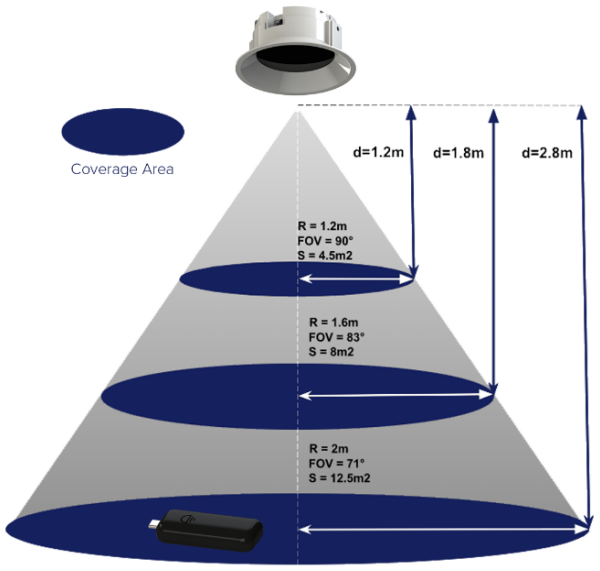



Figure 1 : coverage area


**OLEDCOMM SAS - 10, avenue de l'Europe - 78140 Vélizy-Villacoublay-France**
**Siret: 74985413900013 - NAF: 4741Z - TAX: FR24749854139 - RCS Versailles B 749 854 13**