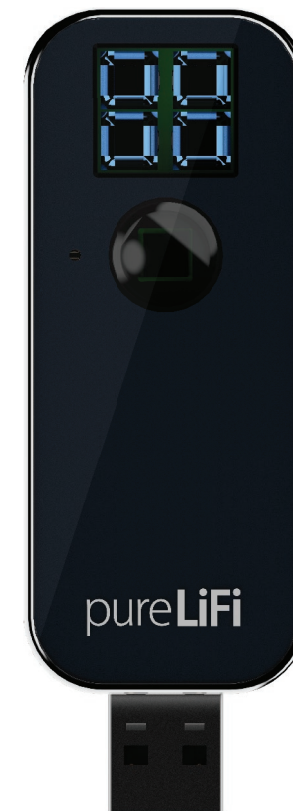


LiFi-XC Station User Manual

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www.pureLiFi.com



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Abbreviations

AP	- Access Point	TX	- Driver
LiFi	- Light Fidelity	WiFi	- Wireless Fidelity
PoE	- Power Over Ethernet	LED	- Light Emitting Diode
PSU	- Power Supply Unit	USB	- Universal Serial Bus
STA	- Station	WPA2	- Wi-Fi Protected Access 2
IR	- Infrared	OS	- Mac OS

Disposal

Please contact your local authority for disposal guidance or return to pureLiFi for disposal



1. Definitions

1.1. Unrestricted location

A location where access to the transmission/receiver equipment and open beam is not limited (accessible to the general public)

1.2. Restricted location

location that is normally inaccessible by the general public (including workers, visitors, and residents in the immediate vicinity) by means of any administrative or engineering control measure but that is accessible to authorized personnel (e.g. maintenance or service personnel including window cleaners in exterior locations) that may not have laser safety training

1.3. Controlled location

location where an engineering or administrative control measure is present to make it inaccessible except to authorized personnel with appropriate laser safety training



Caution

Use of controls, or adjustments, or performance of procedures other than those specified herein may result in hazardous radiation exposure.
The appropriate aviation authorities shall be notified if the nominal hazard zone (NHZ) intercepts navigable airspace.

This is a Class 1 FSOCS transmitter and may be installed in unrestricted, restricted, or controlled locations as defined in this manual.

IR safety – Under IEC60825-12, Class 1M laser. Under IEC62471, Exempt Group

For Your Safety

- Use only with the included accessories
- Do not remove the housing of the access point
- Do not repair this unit by yourself
- Installation should be carried out by appropriately trained personnel
- Refer servicing to qualified service personnel
- Ensure that all applicable and recommended safety measures for tools used in installation are taken

System Parameters

Full System

Parameter	Nominal Value	Unit
Downlink line rate (max.):	43	Mbps
Uplink line rate (max.):	43	Mbps
Minimum operational distance	1.0	m
Maximum operational distance	6.0	m
Maximum concurrent users	8	-
Inter-AP handover (roaming)	Supported	-
Atto-Cell Diameter @ 2.5m range	2.8	m
Atto-Cell Diameter @ 3m range	3.5	m

LiFi-XC Station

Parameter	Nominal Value	Unit
Data interface	USB 2.0	-
Max. power consumption	2.5	W
Unit Size	85 x 29.4 x 10.2	mm
Unit weight	42	g
Operating temperature	0 - 35	°C
Humidity (Non-condensing)	20 – 95	%

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pureLiFi System: The Benefits of LiFi

LiFi Technology

LiFi technology allows LED lights to modulate at a rate exceeding millions of times per second - imperceptible to the human eye but readily detected by a LiFi receiver - enabling the light source to transmit high speed wireless data. Configuring a light source with pureLiFi's 'LiFi' technology creates a highly-localised wireless hotspot for access to the network. The pureLiFi LiFi-XC system offers the ability to deploy a fully networked LiFi solution. LiFi-XC supports multiple access, roaming, complete mobility and ease of use – providing a comparable level of user experience to existing wireless technologies, like Wi-Fi.



Secure

Light can be contained. Light cannot travel through walls, which means a LiFi signal can be secured in a physical space. pureLiFi's technology also enables additional control as data can be directed from one device to another. Users can see where data is going.



Location Services

LiFi systems are fully networked, and each LiFi enabled light has its own unique IP address which means advanced geofencing can be deployed simply in a LiFi network.



No Interference

Radio frequency technology such as Wi-Fi is vulnerable to interference from a wide range of devices such as cordless phones, microwaves and neighbouring Wi-Fi networks. LiFi signals can be defined by the area of illumination, which means interference is much simpler to avoid and even stop altogether. This also means LiFi can be used in RF hostile zones such as hospitals, power plants and aeroplanes.



Efficiency

LiFi allows the repurposing of light for communications as it uses the same infrastructure. LED lights are already widely efficient, and LiFi gives them another purpose, connectivity.



Data Density

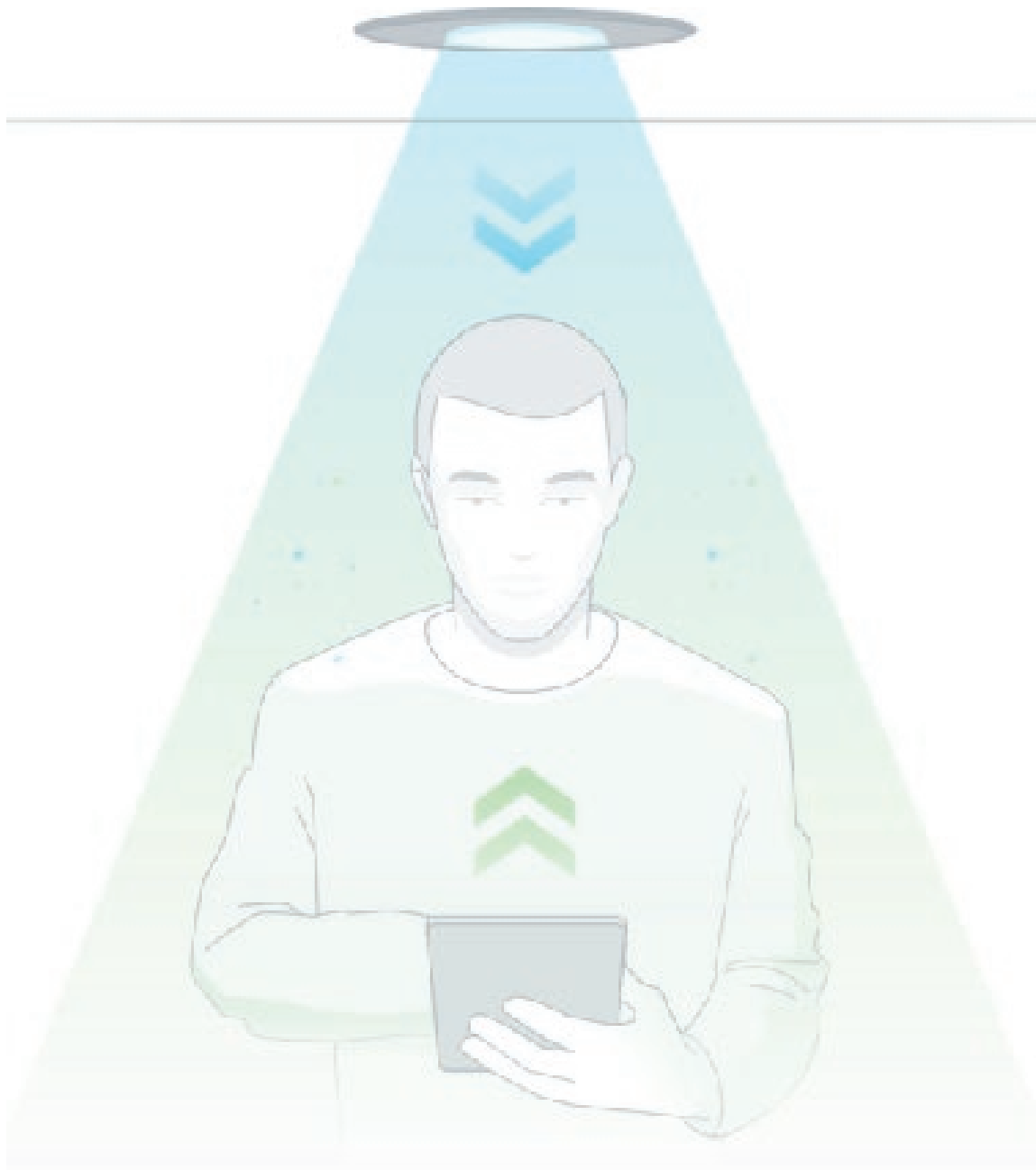
Data density offers a greater user experience as it reduces the need to share the wireless bandwidth with other users. LiFi can achieve approximately 1000 times the data density of Wi-Fi offering more data per square metre. This is an important factor for wireless efficiency.



Smart Lighting

Any private or public lighting including street lamps can be used to provide LiFi hotspots, and the same communications infrastructure can be used to monitor and control lighting and data.

pureLiFi System: How it works



LiFi Access Point

The Access Point, which can serve several users just as a traditional WiFi router would, is mounted on the ceiling alongside your luminaire.

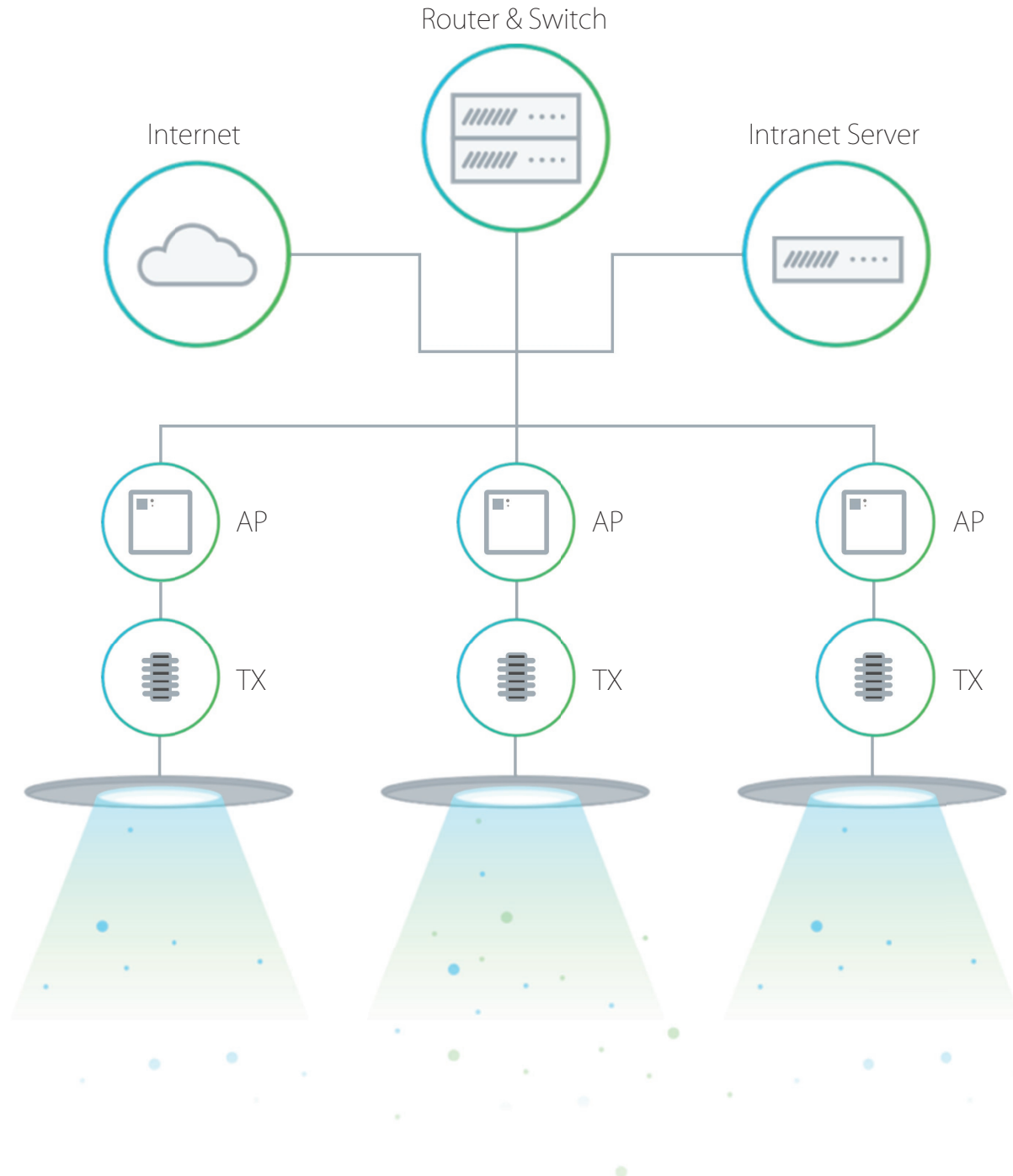
Data Access

The LiFi Station can access your data connection anywhere within the illuminated area.

LiFi Station

The LiFi Station plugs into a standard USB 2.0 port on any supported device and connects to the Access Point, just as a traditional USB cellular dongle would.

Typical Deployment of the pureLiFi Network



pureLiFi System: Key components



Access Point (AP)

Each LiFi-XC Access Point is capable of serving multiple users simultaneously and allows users to move to an adjacent LiFi-XC AP without the need to manually re-establish connection, leading to a seamless user experience. The LiFi-XC AP also allows the attached LED luminaire to be dimmed using a proprietary control protocol, DALI, 0-10V, and COAP where available via control input.



TX Driver (TX)

The LiFi-XC TX Drivers allow for easy adaptability to many "off the shelf" LED luminaires.



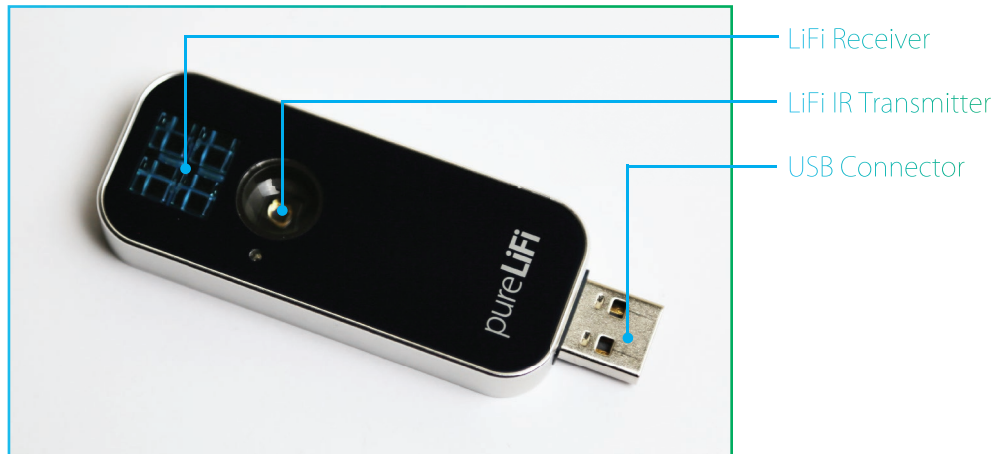
Station (STA)

The LiFi-XC Station (STA) unit is USB powered to enable complete mobility and ease of use. The system simply uses existing operating system tools for scanning and connecting to LiFi-XC APs providing the user with a familiar network configuration and management interface.

Features

- Fully networked LiFi system providing end-to-end IPv4 and IPv6 connectivity
- Full-duplex wireless link providing over 43 Mbps in downlink and uplink
- A single access point (AP) supports up to 8 stations (STAs)
- Capable of working with a range of LED luminaires
- TR-069 remote provisioning and management.
- DALI, 0-10V and CoAP support
- Proprietary protocol for power management/dimming when others unavailable
- Control input for switch or dimming control

pureLiFi USB Station: About the Station



LED Status

Red:

Driver loading (immediately after plugging in)
Driver not installed
Device not recognised Insufficient power on USB port

Orange:

The station is unable to receive a signal from the AP

Green:

The station is receiving a signal from the AP

Features

- Roaming supported between APs connected to the same subnet
- USB powered STA unit allows complete mobility
- Supports WPA2 Personal and Enterprise (802.1X) authentication
- Compact design for improved mobility and handling
- Connection status indication

Caution



IR emitted from this product.
Do not stare at operating transmitter.

Installing the Software

Before plugging in your station for the first time, please install the appropriate drivers by following all installation instructions. First, choose the appropriate section for your operating system and follow the installation instructions below.

Option 1: Windows Installation

To install the station drivers on Windows, follow the instructions beginning on page 10.

Option 2: Linux Installation

To install the station drivers on Linux, follow the instructions beginning on page 13.

Option 3: macOS Installation

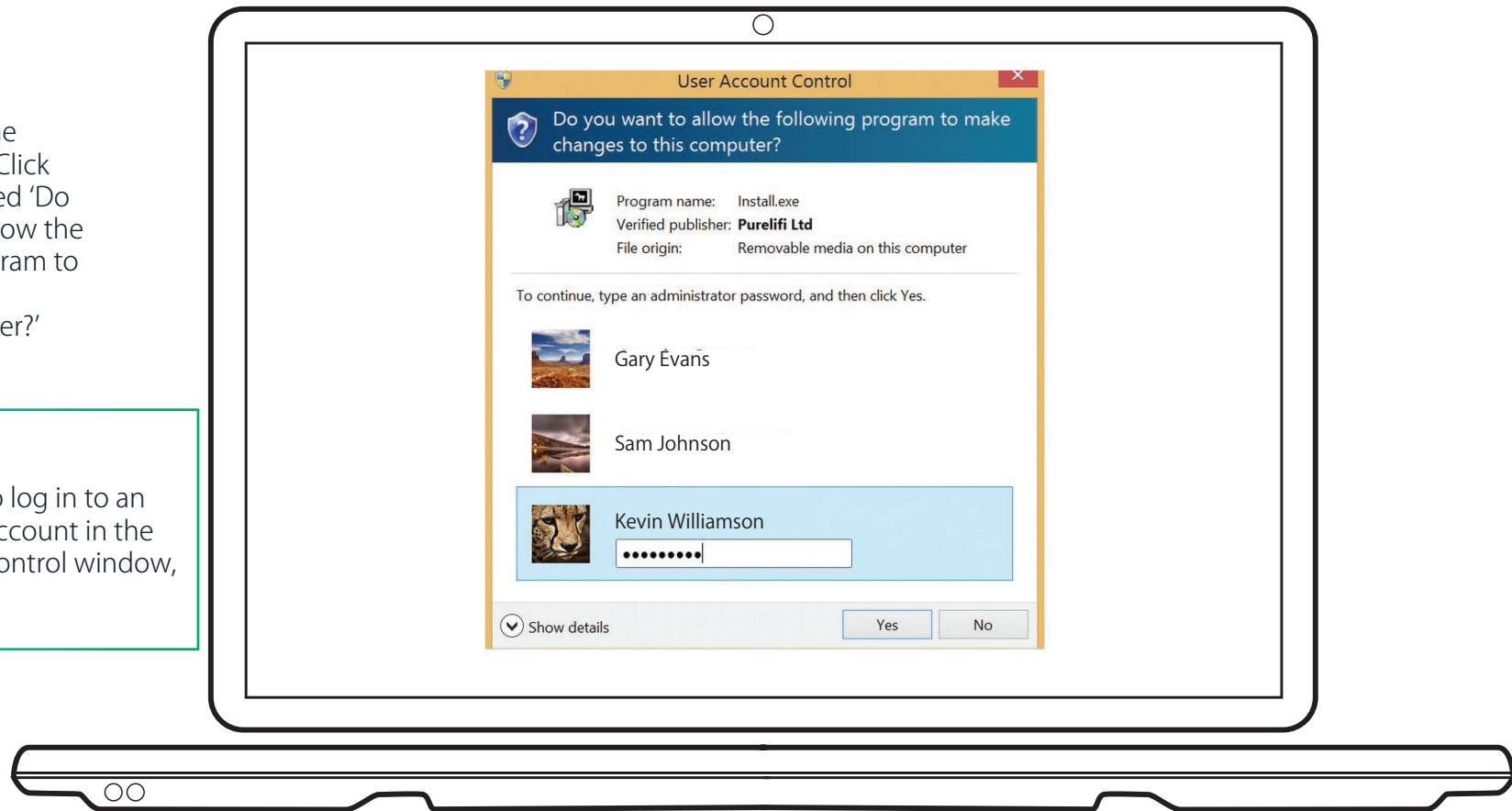
To install the station drivers on macOS, follow the instructions beginning on page 14.

Option 1: Windows Installation

1. Double click the [Install.exe](#) file. Click 'yes' when asked 'Do you want to allow the following program to make changes to this computer?'

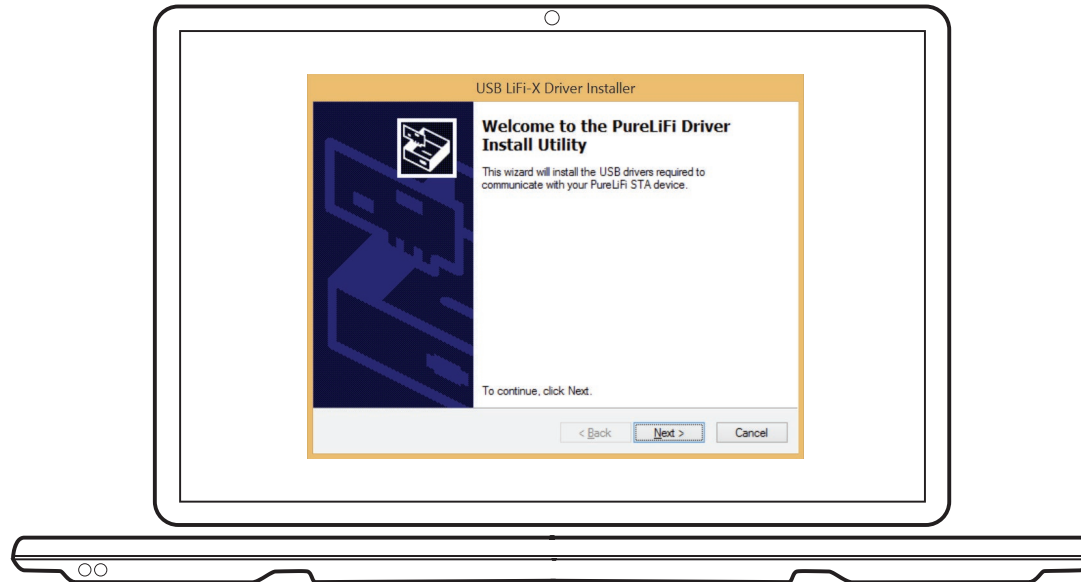
Note:

You will need to log in to an Administrator account in the User Account Control window, as shown.

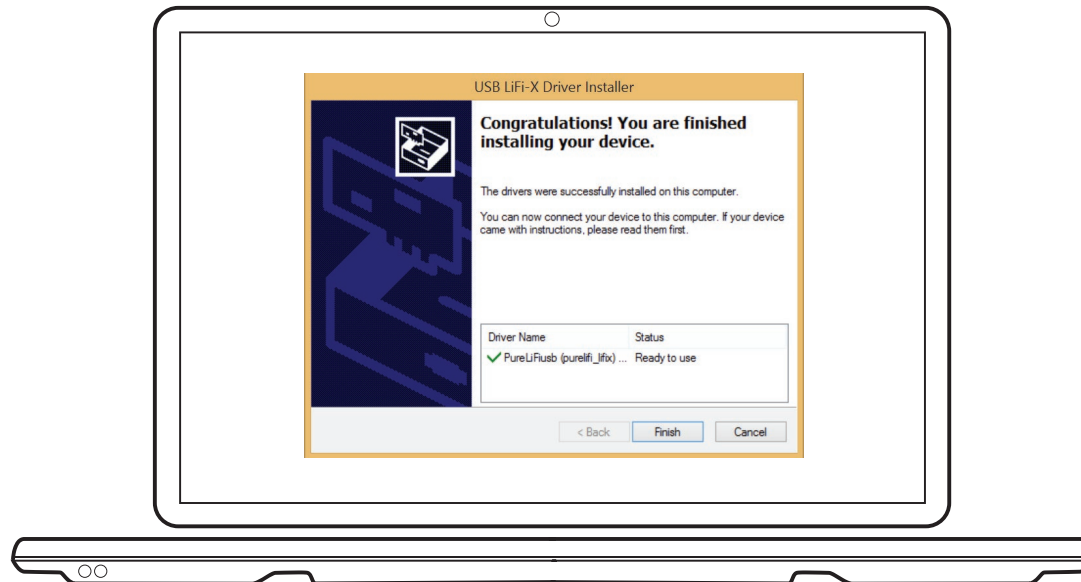


Option 1: Windows Installation

2. When the USB LiFi-XC Driver Installer opens, click **Next** in the USB LiFi-XC Driver Installer welcome window, as shown to the right.



3. Click **Finish** in the USB LiFi-XC Driver Installer congratulations window, as shown to the right.

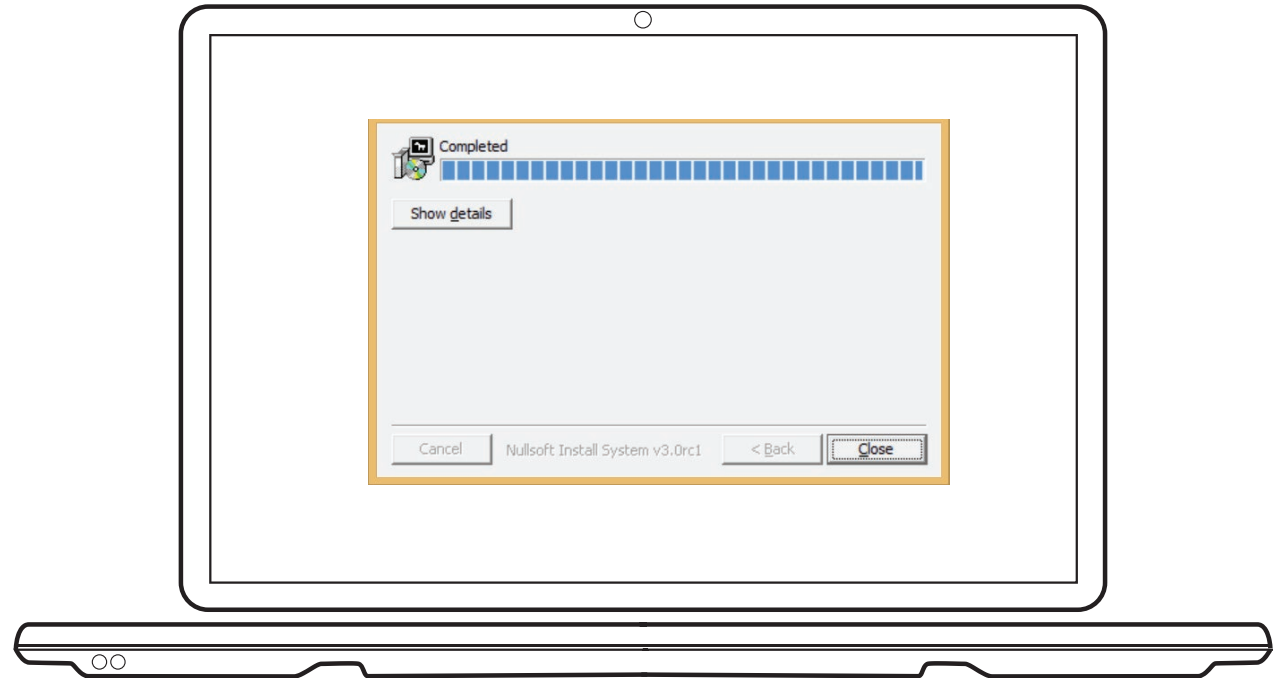


Option 1: Windows Installation

4. Click [Close](#) in the USB LiFi-XC Driver Installer completed window, as shown to the right.

Next:

You're almost done! Next you will need to connect your station - follow the [Connection Instructions](#) on page 18



Option 2: Linux Installation

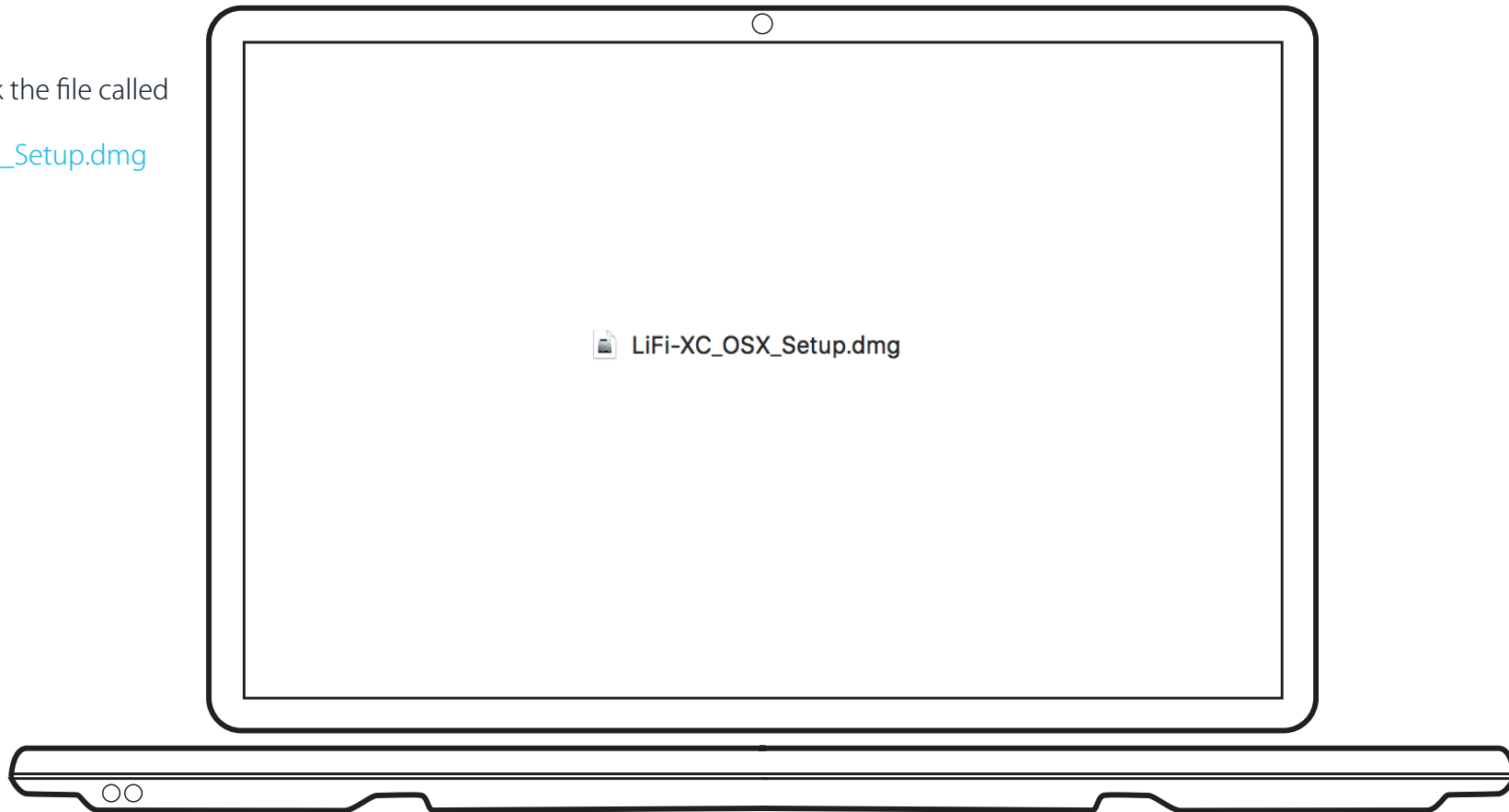
Next:

You're almost done! Next you will need to connect your station - follow the [Connection Instructions](#) on page 16.

1. Download the source code from purelifi.com/support
2. 'cd' to the folder and type 'make all'
3. Type 'sudo make install' to complete the installation

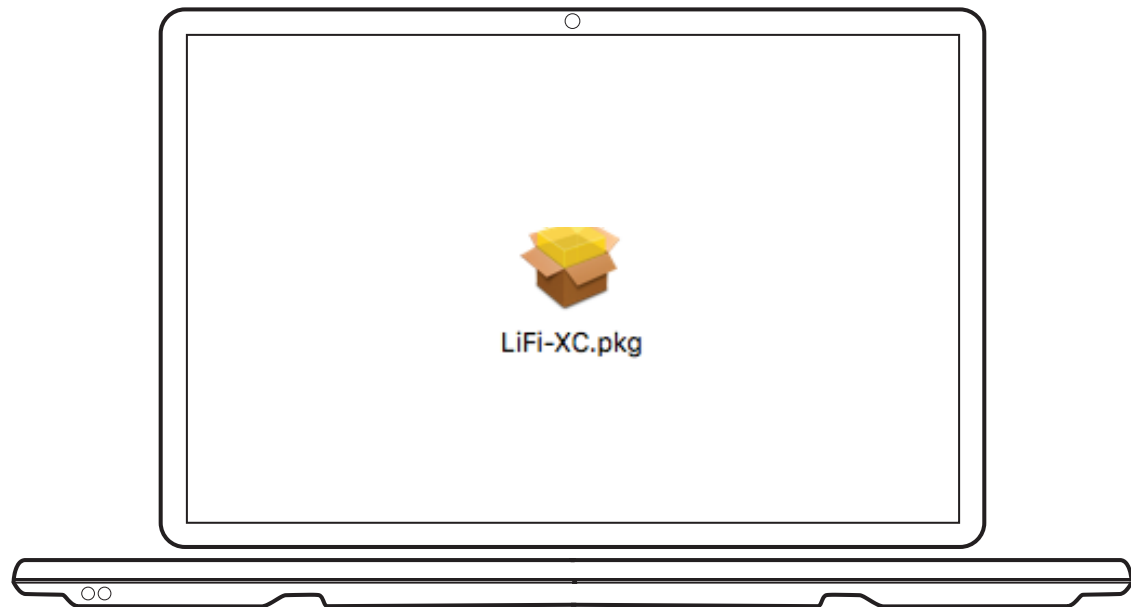
Option 3: macOS Installation

1. Double click the file called
LiFi_XC_Driver_Setup.dmg



Option 3: macOS Installation

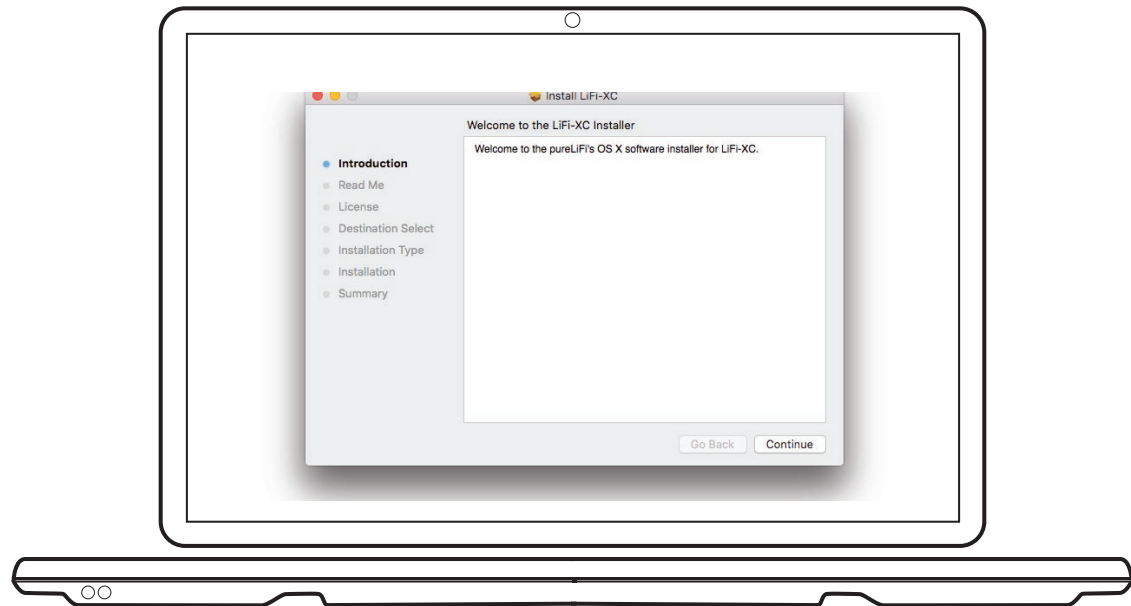
2. Double click on the file called [LiFi-XC.pkg](#)



3. Follow the instructions in the installation pop up.

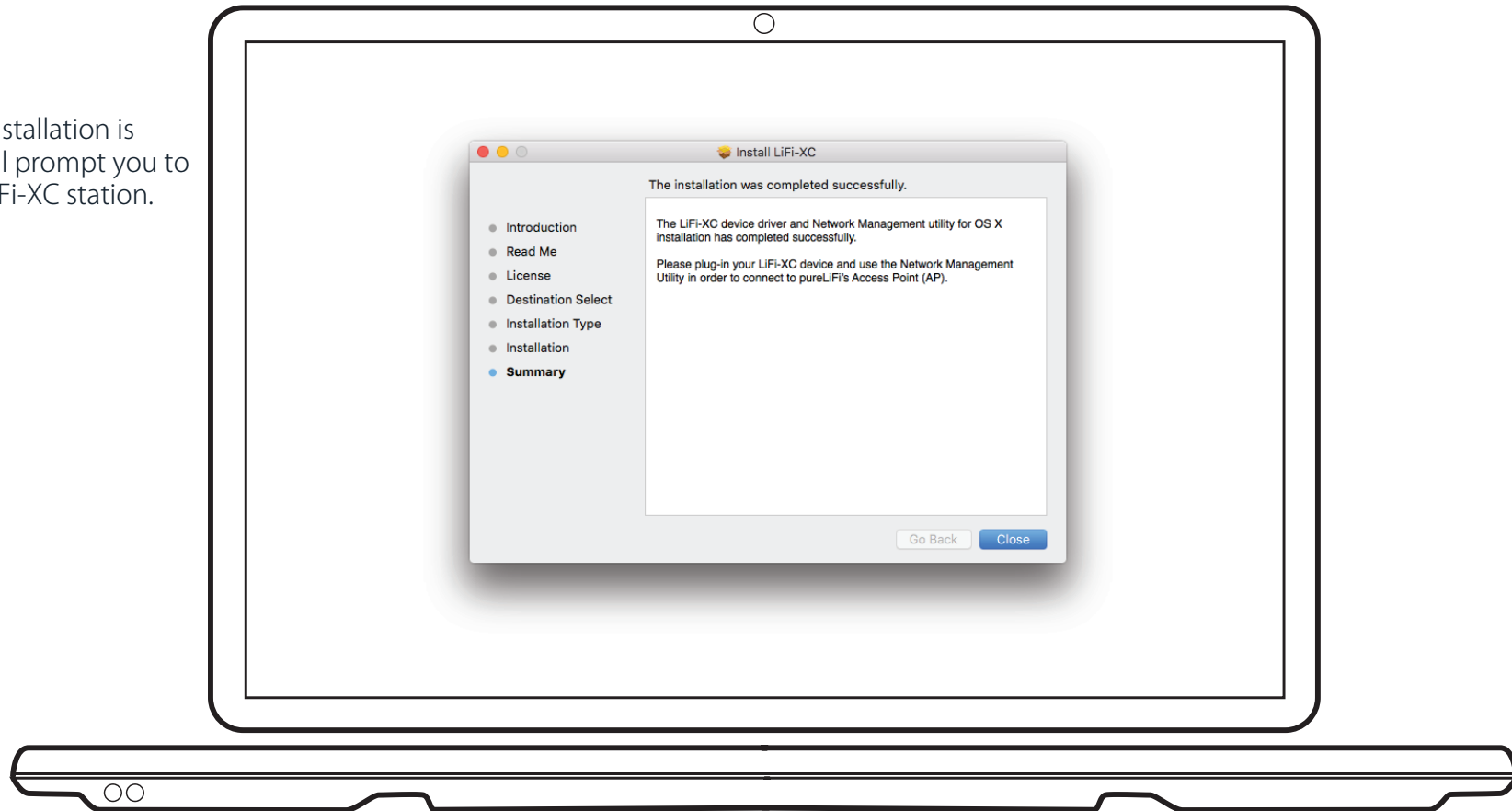
Note:

You will need to log in to an Administrator account in the User Account Control window.



Option 3: macOS Installation

4. Once the installation is complete it will prompt you to plug-in your LiFi-XC station.



Connecting the Station

The station can be connected to your computer two ways, either directly into a USB port *OR* via the included USB extension cable.

Option 1: Directly



Connecting the Station

Option 2: via the USB extension cable



Note:

Using the USB extension cable may affect the performance and correct functioning of the station.

Connecting to an Access Point

Now that the software is installed and your station is plugged in, please choose the appropriate section for your operating system and follow the configuration instructions below.

Option 1: Windows Configuration

To configure the station on Windows, follow the instructions beginning on page 19.

Option 2: Linux Configuration

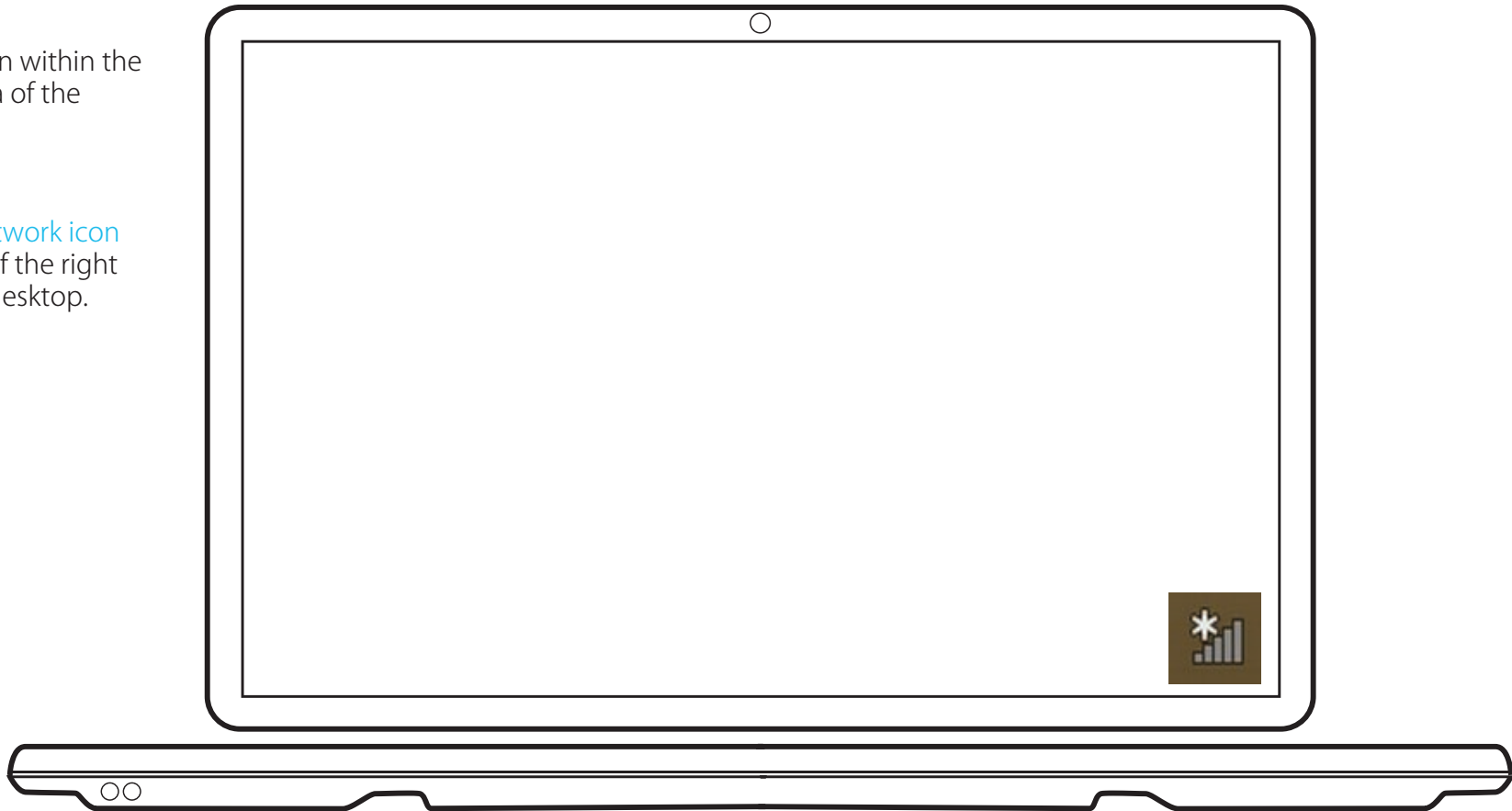
To configure the station on Linux, follow the instructions beginning on page 22.

Option 3: macOS Configuration

To configure the station on macOS, follow the instructions beginning on page 23.

Option 1: Windows Configuration

1. Place the station within the illuminated area of the access point.
2. Click on the [network icon](#) in the bottom of the right corner of your desktop.



Option 1: Windows Configuration

3. Select your wireless network from the expanded network list, as shown in the example list to the right.

Note:

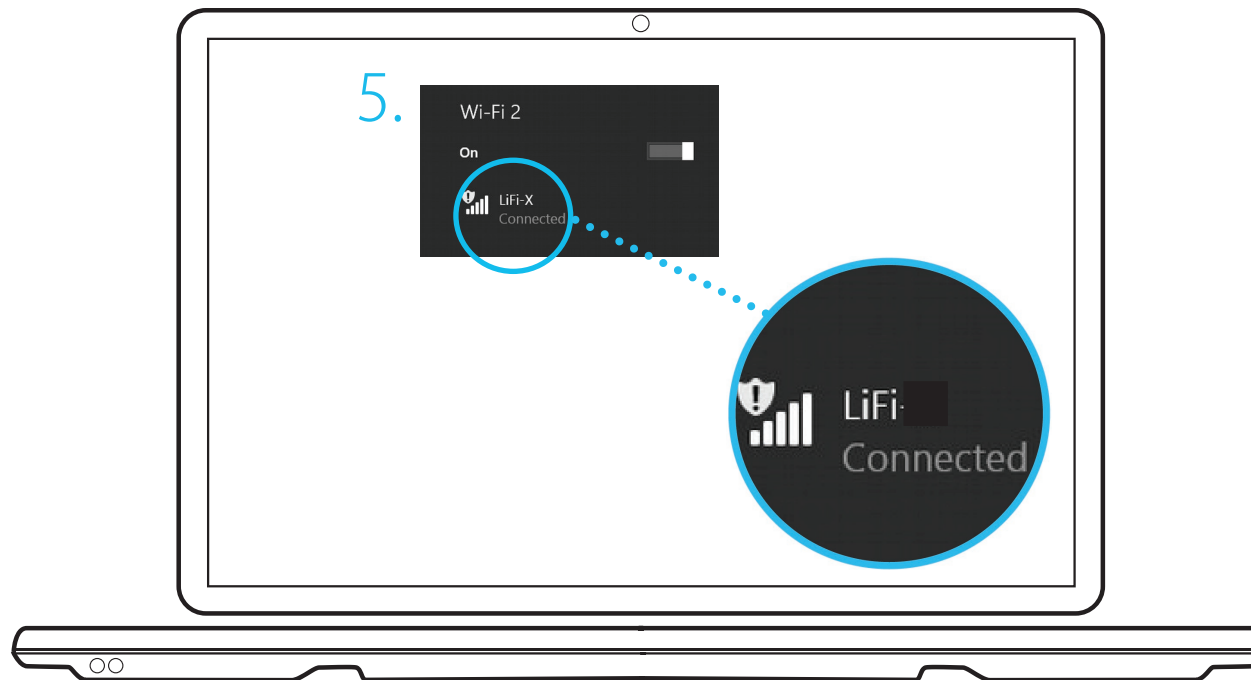
The network name may be different from **LiFi-XC** if it has been changed from the default on the Access Point.

4. Click **Connect**, as shown to the right, and then follow on-screen instructions.



Option 1: Windows Configuration

5. You will know your wireless network is connected successfully when you see the **Connected** status shown under your wireless network, as shown to the right.

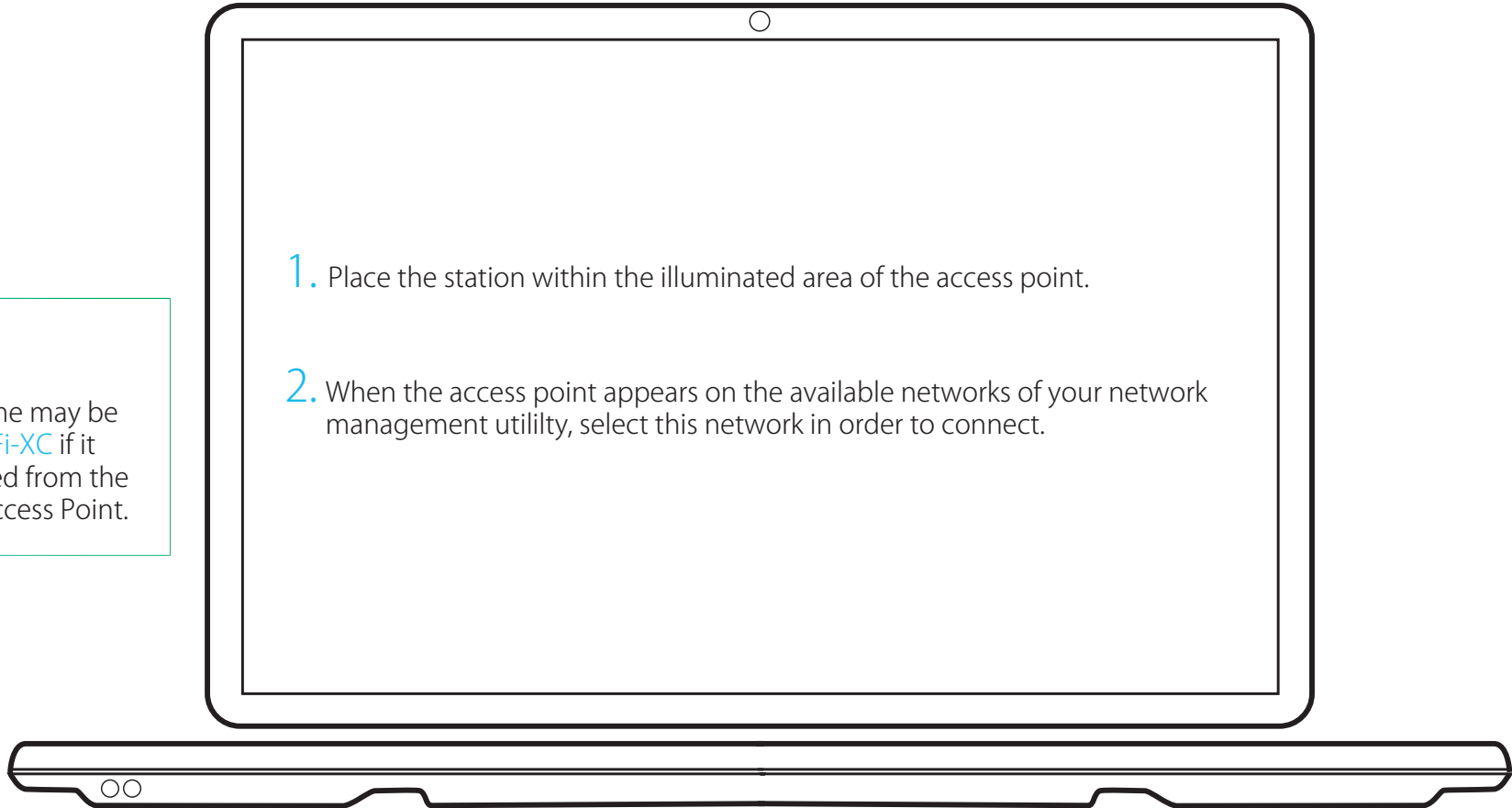


Option 2: Linux Configuration

Note:

The network name may be different from **LiFi-XC** if it has been changed from the default on the Access Point.

1. Place the station within the illuminated area of the access point.
2. When the access point appears on the available networks of your network management utility, select this network in order to connect.



Option 3: macOS 10.12 & macOS X 10.11 Configuration

macOS 10.12

1. The pureLiFi wireless manager applications manager will be running automatically. Here you can select whether you want to create a WPA2 personal or a WPA2 enterprise network.

Click on [Security Mode](#) to select the network type required.

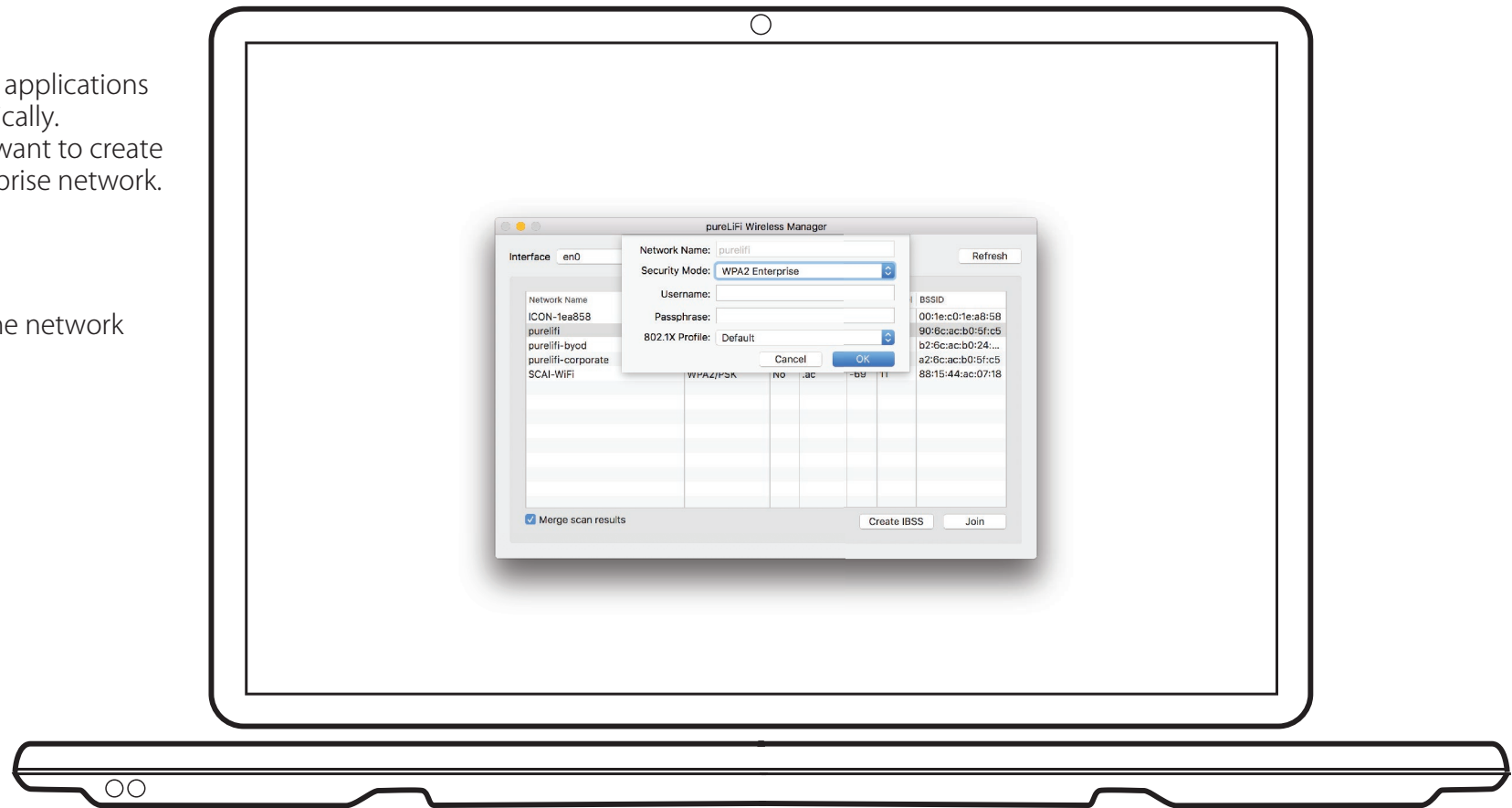
Information Required

WPA2 Enterprise

Username
Password

WPA2 Personal

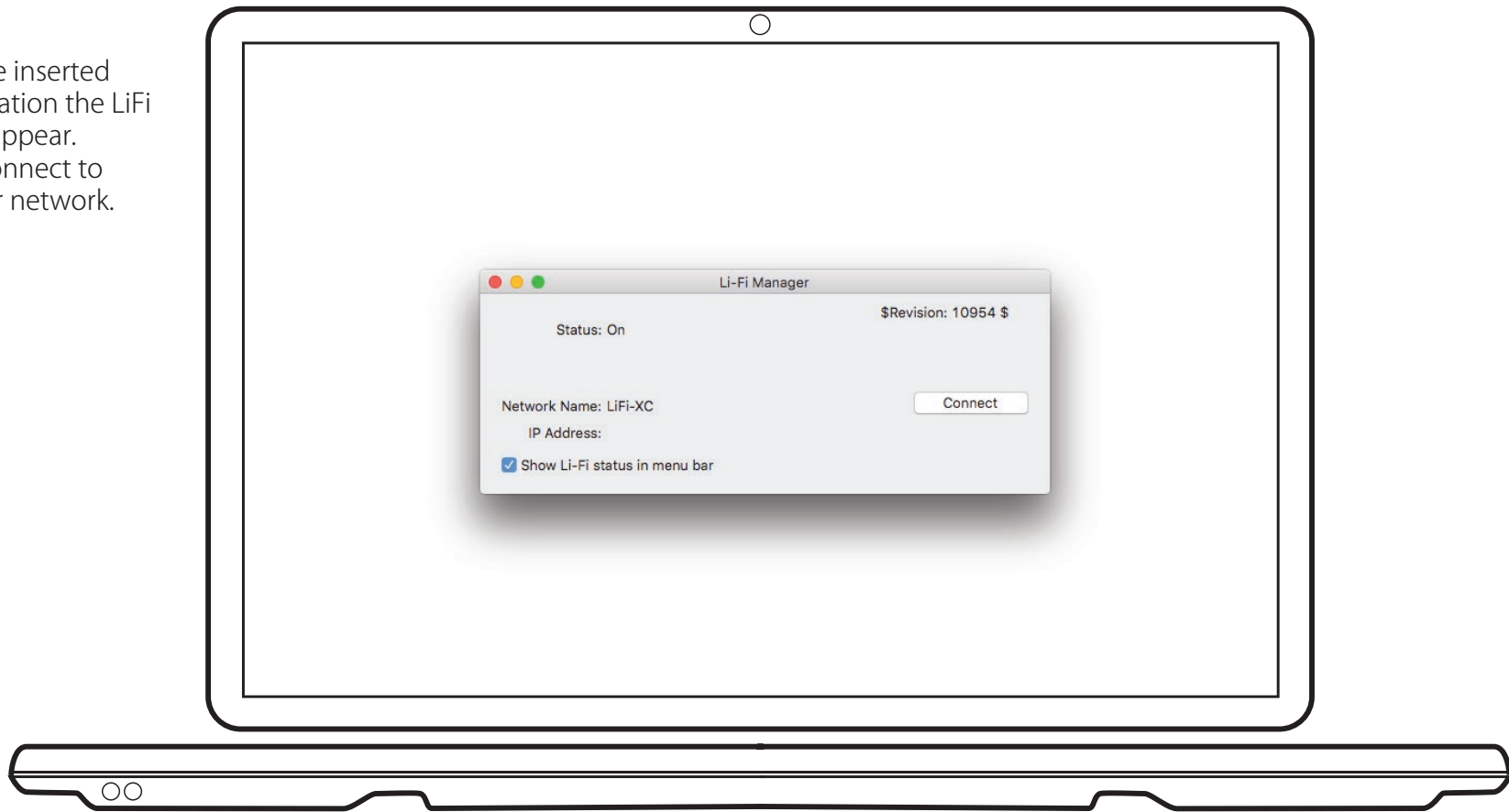
Password



Option 3: macOS Configuration

macOS X 10.11

Once you have inserted your LiFi-XC station the LiFi Manager will appear. Simply click connect to configure your network.



Congratulations!

You are now ready to use LiFi.

Follow pureLiFi

Stay up to date with the latest developments in LiFi



Additional Support

For any additional support, please visit or email us at:

www.pureLiFi.com/support
support@pureLiFi.com

Light becomes data

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