

**Imagine a world
where every
light could
connect you to
the Internet.**

Imagine LiFi.



LiFi can turn every LED light in our homes, offices, cities and nations into a high-speed secure internet access point.

We are approaching a spectrum crunch and as the world faces the prospect of servicing a staggering 20 billion connected devices we will require new ways to wirelessly connect. LiFi can open up 1000 times greater spectrum which can enable unprecedented data and bandwidth.

LiFi can be anywhere there is both lighting and wireless communications and play a vital role in our smart homes, buildings, and cities.

Additionally, LiFi offers many unique benefits in key areas such as:

- › Hostile RF environments: Hospitals, Power Plants, Industrial Automation and even Aircrafts
- › Location Services: Retail, Logistics, Tourism
- › Security: Finance, Defence

A circular recessed ceiling light fixture is shown in a dark room. The fixture is illuminated from within, creating a bright, glowing center that tapers into a wide, soft beam of light that spreads downwards. The surrounding ceiling and walls are dark, making the light fixture the central focus. The text "The world's first LiFi integrated Luminaire." is positioned to the right of the light fixture.

**The world's first
LiFi integrated
Luminaire.**

LiFi -X

The world's fastest, smallest and most secure LiFi system.



What can we offer?

pureLiFi has produced the first commercially available LiFi system. pureLiFi offers high speed bidirectional networked and mobile communication of data using light.

- › Full duplex communication with a 42Mbps downlink and 42Mbps uplink;
- › Full mobility (portable, USB-powered dongle)
- › Multiple users per LiFi Access Point, supported through multiple access
- › Secure wireless communications constrained by walls, eliminating the risk of signal leakage to external eavesdroppers
- › Safe wireless communication in environments where radio frequencies are not suitable
- › Flexible deployments
- › Extensive range of wireless communication applications including and beyond existing Wi-Fi
- › A cost-effective delivery of light and data via a single infrastructure

Frequently Asked Questions

How does LiFi work?

LiFi is high speed bidirectional networked and mobile communication of data using light. LiFi comprises of multiple lightbulbs that form a wireless network.

When an electrical current is applied to a LED light bulb a stream of light (photons) is emitted from the bulb. LED bulbs are semiconductor devices, which means that the brightness of the light flowing through them can be changed at extremely high speeds. This allows us to send a signal by modulating the light at different rates. The signal can then be received by a detector which interprets the changes in light intensity (the signal) as data.

The intensity modulation cannot be seen by the human eye, and thus communication is just as seamless as other radio systems, allowing the users to be connected where there is LiFi enabled light. Using this technique, data can be transmitted from a LED light bulb and back at high speeds.

Can we see LiFi lights flicker?

The LED lights used to transmit LiFi signals are modulated at such a fast rate that the eye cannot perceive the modulation or “flicker”. This is similar to the way our eyes do not interpret the break between film frames in a motion picture. Just as you see a smooth motion on the cinema screen, you will see an uninterrupted source of steady light streaming from a LiFi enabled luminaire.

As a comparison, the lowest frequency at which the lights are modulated is 1MHz and this is 10,000 times higher than the refresh rate of our computer screens.



How does LiFi work in a bright room with sunlight?

LiFi can operate in daylight and even in direct sunlight conditions, as the modulated light can still be detected. LiFi relies on detecting the fast changes in light intensity and not on the absolute or slowly varying levels caused by natural disruptions in daylight or sunlight. LiFi technology modulates the light at very high rates and sunlight is constant light and therefore can be filtered out at the receiver.

Our team at pureLiFi has tested our receivers outdoors under 77,000 Lux of sunlight.

How does LiFi work when you turn off the lights?

If all power to a light is turned off then there is no LiFi. However, LiFi technology can be enabled to dim low enough that a room will appear dark and still transmit data. There is consistent performance between 10 and 90 percent illumination.

Currently, pureLiFi's technology provide communications at light levels down to 60 lux. For comparison the British standard for minimum light level for reading is 400 lux.

There are also other options for using invisible parts of the light spectrum such as infra-red, which is currently already being used for sending information back to the lightbulb (uplink).

Is LiFi a line of sight technology?

Light bounces off of surfaces and therefore LiFi is not strictly a line-of-sight technology.

LiFi is a cellular communication system and the data rate is not dependent on the line of sight but on the signal quality at the device. Signal quality can be defined by the ratio of the desired data vs any interfering data and noise.

Will LiFi work in my pocket?

No LiFi does not work in your pocket, unless you have a transparent suit.

LiFi is a complimentary technology that works alongside other wireless technologies such as Wi-Fi. If the light signal to a LiFi enabled device is below the receiver's threshold then it will not receive data. In that instance, radio systems or cellular networks, if available, will continue to deliver data.



However, the moment the device begins to receive light from a LiFi light bulb, then the device will resume high speed communications using light as an additional communications medium.

How is LiFi more secure than other wireless technologies?

pureLiFi is developing the security components and technologies that enable security specialists to deliver more secure wireless communications.

LiFi is significantly more secure than other wireless technologies because light can be contained in a physical space. Our doors and blinds can be shut, and physical barriers and adjustments can be implemented to contain and protect the light. We can create the conditions that allow us to shut the door on our wireless data.

It should be understood that the existing security protocols for encryption and authentication can be leveraged in LiFi systems to provide even more secure wireless systems.

How much does LiFi cost?

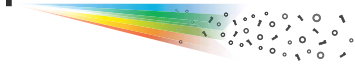
pureLiFi is currently working towards miniaturisation of LiFi technology. Ultimately the end goal is to have LiFi in every mobile device. This means that the technology will be affordable for integration into handsets, tablets and laptops.

Ultimately the end consumer will see minimal or no cost associated with LiFi as the goal is to have LiFi embedded in every wireless mobile device.

Today companies can speak to pureLiFi about working with us on proof of concept projects and other types of installations. These installations are priced based on individual requirements.

Light becomes data

pureLiFi



**Digital copies of this document are available at
www.pureLiFi.com/showcase**

For further information visit www.pureLiFi.com

Media Enquiries:

sarah.scace@purelifi.com

+44 (0) 753 022 6575

General Enquiries:

info@purelifi.com

+44 (0) 131 516 1816