In partnership with signify

Consolite® Technology Ltd

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Certified to ISO9001:2015

Naval LiFi System

Wireless data where WiFi is not an option
Using Infra Red for faster, more efficient data transfer

The datasheet outlines equipment designed for use in Naval applications but many other variations are available or can be manufactured for specific use cases – please get in touch.

Based on Signify's highly successful LiFi system, Consolite has re-engineered the technology to be suitable for the Naval environment.

Meeting the relevant Def Stans and Mil-Stds this product is developed for use in situations where Wifi is not an option.

LiFi Technology - advantages and uses

LiFi (Light Fidelity) is a method of transferring data using light, whereas WiFi transfers data using radio frequencies.

There are many benefits of transferring data through light.

- Security: The USB key must be within the "Line of Sight" (light cone) of the transceiver providing a high level of Physical Security. The USB Key must be in line of sight of the transceiver.
  As light does not penetrate walls this provides a Low Probability of Detection (LPD) and a Low Probability of Interception (LPI).
  The communications does not suffer from interference in the same way RF does.
- Speed: The data from the Access Point (AP) is only used by those beneath the AP so it is not shared amongst multiple users.
- Bandwidth: WiFi makes use of radio communications, of which the spectrum has become very crowded and is very often licensed. The LiFi spectrum is unlicensed and offers virtually unlimited bandwidth.
- RF interference: LiFi does not interfere with sensitive equipment in the way that WiFi can so it can be used in highly technical areas like machinery spaces and operations rooms, in explosion proof areas and nuclear facilities.

Providing fast data rates throughout a ship allows connectivity in a way that hasn't been experienced before. Crew can become connected in the same way as society does. Fast communications, video linking, geo-location, instant access to maintenance documents, on the job training through augmented reality, and fast logging of maintenance activities are just some of the new realities of a connected warship.

Shipyard worker connectivity during refit can provide significant time savings – studies estimate at least 20% savings by providing data at the point of need. Imagine a 20% saving in labour during a refit period on an aircraft carrier. Designers and Project Managers could have access to maintenance documentation and e-mail whilst out of the office as well as a solid phone signal in the lower decks of the ship.

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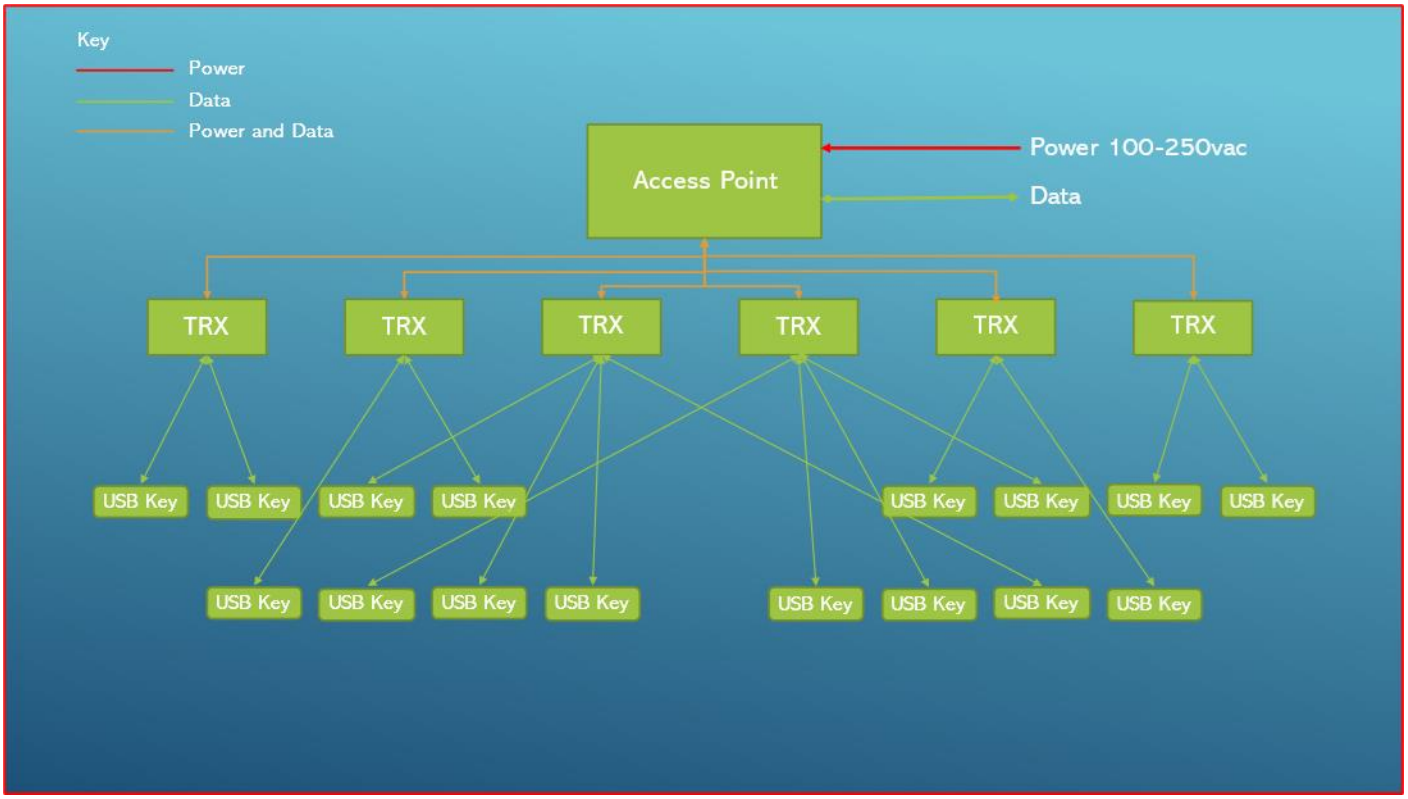
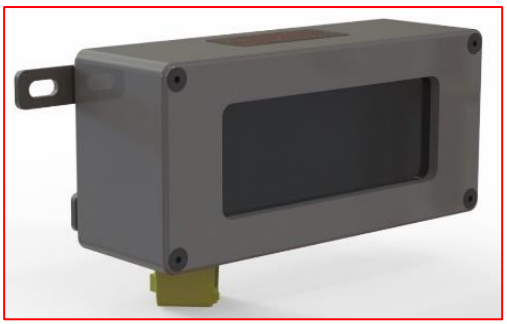
The system consists of 3 components:

- 1 x **Access Point** (see page 3) to connect power and data
- Up to 6 x **Transceivers** (see page 4) can be connected to the Access Point
- Up to 16 x **USB Keys** (see page 6) can be connected at any time



CTL-477-003



CTL-475-002

CTL-475-001

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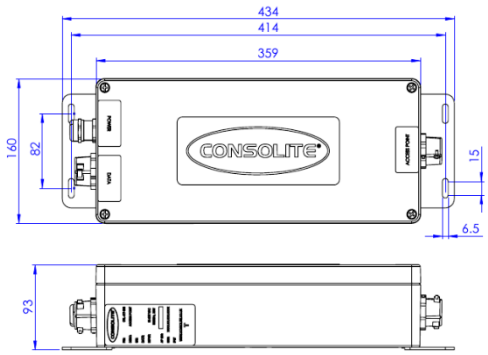
Access Point (connection for data and power)

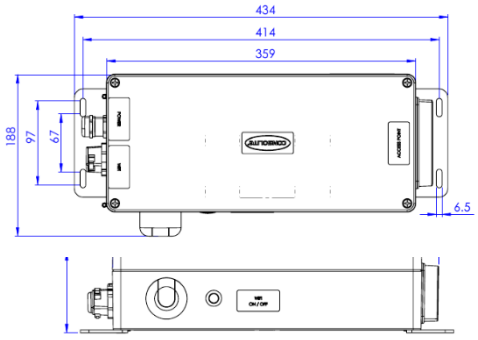
The Access Point is the connection point for power and data. The Transceivers are plugged in here with IP65 glands. A WiFi capable version is available – the WiFi is disabled locally when not required.

Technical Details

Part number	CTL-475-003 or CTL-477-003
Mains voltage	100 – 240V, 50/60Hz
System power	38W (based on 6 transceivers connected)
Power factor	0.5
Average ambient temperature	25°C
Operating temperature range	-40 to +40°C
Network communication	Data link connection RJ45 Cat.5/5E/6 cable
Multi-user capability	Up to 16 users per Access Point
Transmission mode	Half duplex
Encryption	End-to-end encryption based on AES-128
Standard	Designed for ITU-T G.9991
WiFi (CTL-477 only)	IEEE 802.11n/b/g 2.4 GHz 300Mbps
Weight	< 6kg



CTL-475-003



CTL-477-003 (WiFi enabled)

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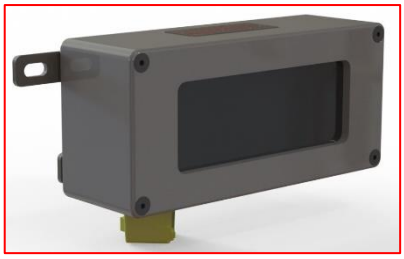
Transceiver (detector connected to access point)

The transceiver is designed to be used between 1.2 and 2.8m from the USB key. Data rates are best inside a 60 degree cone. The housings shown below are standard.

We specialise in custom housings to suit each application – please ask for bespoke housings.

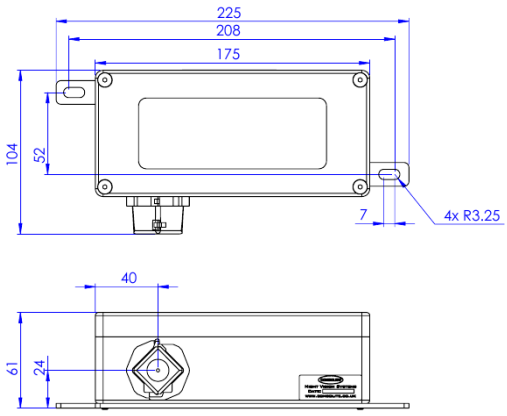
Technical Details

Part number	CTL-475-002 and/or CTL-477-002
Voltage	24V DC provided by the CTL-475-003 Access Point
Wireless optical communication	Infrared
Average ambient temperature	25°C
Operating temperature range	-40 to +40°C
Network communication	Data link input connection RJ12 7m SFTP cable
Transmission mode	Half duplex
Encryption	End-to-end encryption based on AES-128
Download speed	220 Mbit/s
Upload speed	160 Mbit/s
Weight	< 1kg

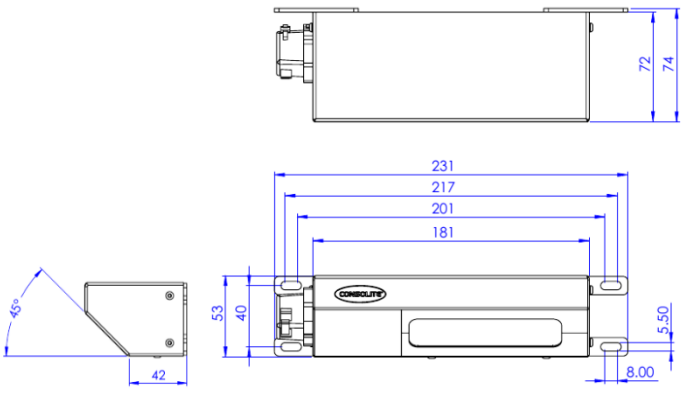


Bulkhead or cabinet mounted

Console or desk mounted



CTL-475-002



CTL-477-002

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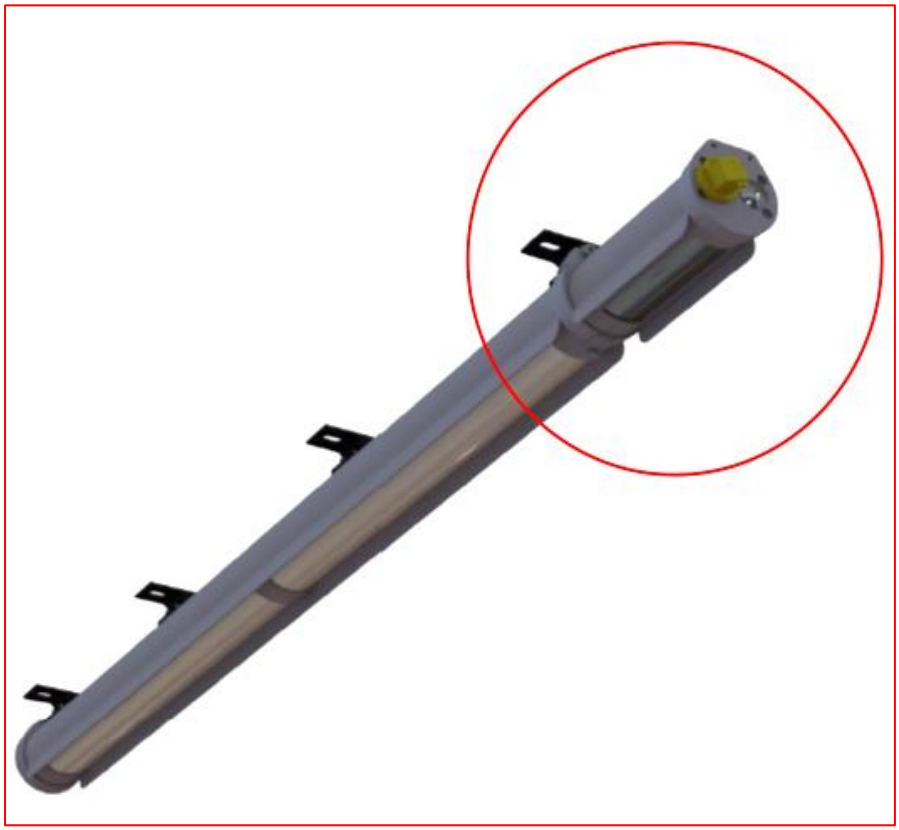
Transceiver (cont.)

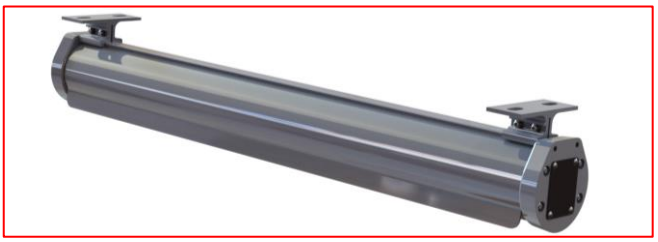
Co-location with light sources

As a light manufacturer Consolite works hard to manage lighting efficiencies, angles, colour temperature, dimming and different lighting modes like red or night vision compatible lighting.

To use LiFi through some (or all) of those other considerations would mean a compromise on light output, data rate, temperature resilience and/or lighting efficiency.

Our IR modules can be added to suitable light fittings without changing the fitting.





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USB Key (for connection to your device)

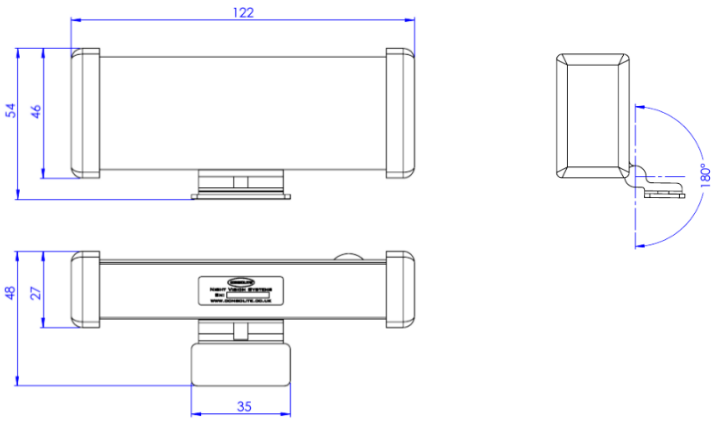
The USB Key is necessary for the device to communicate with the Transceiver. It is plugged by wire directly into the PC, Laptop, Tablet or Smart Phone.

The format shown below is fixed magnetically to the client device via an adhesive metal plate to allow easy removal and stowage. It is fitted with impact absorption bump strips to protect against drops and impact in the field. It is resistant to drops in excess of 5m.

As with the Transceiver, other housings and fixing methods can be tailored to different applications and we specialise in customisation.

Technical Details

Part number	CTL-475-001
Voltage	5V DC via USB 3.0
System power	3.5W
Uplink optical communication	Infrared
Average ambient temperature	25°C
Operating temperature range	-40 to +40°C
Network communication	Data link connection USB 3.0
Download speed	220 Mbit/s
Upload speed	160 Mbit/s
Weight	< 500g



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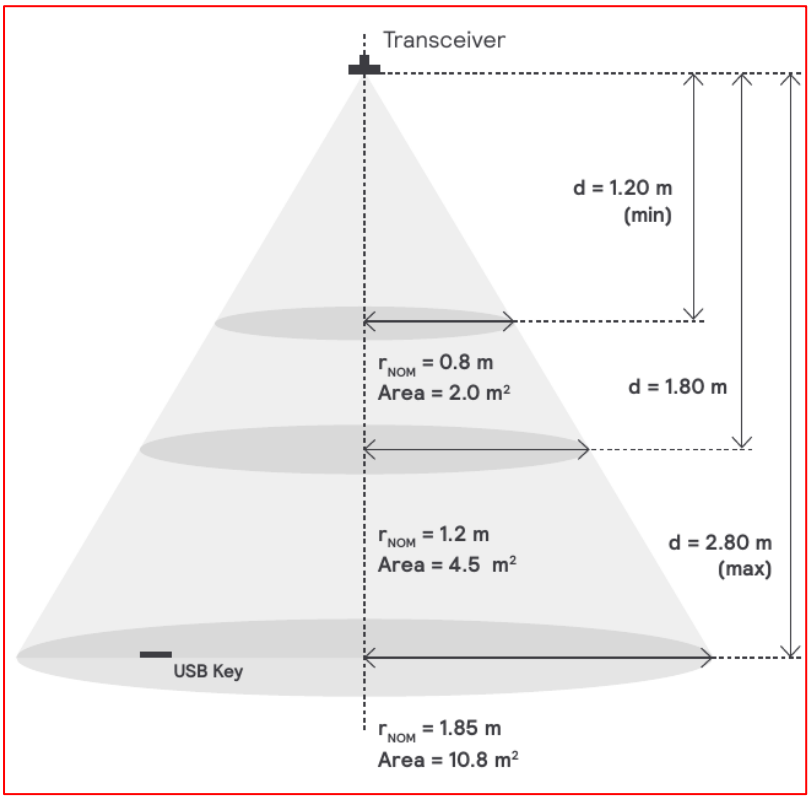
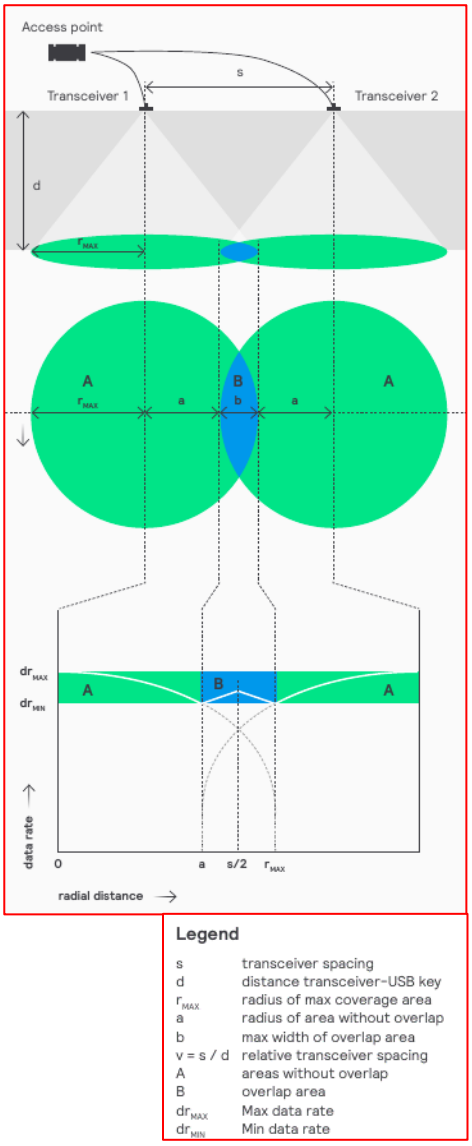
Layout Schematic





Environmental specs

Temperature	IEC 60068-2 and MIL-STD-810G
Humidity	IEC 60068-2 and MIL-STD-810G
Shock	IEC60068-2 and MIL-STD-910
Vibration	IEC 60068-2 and MIL-STD-810G
Ingress Protection	IP65 IAW BS EN 60529
EMC	IEC 60533, IEC 60945 and Def Stan 59-411
Eye safety	BS EN 62471
Finish	IAW Warpaints standard

Consolite has worked with military lighting for over 40 years on both Air and Ship platforms. Consolite specialises in advanced lighting design and test and has become the authority in lighting for Naval applications worldwide.

The Consolite Data via Infra-Red system is the next generation of that expertise, taking lighting to a new level.

Consolite's partnership with the Philips Signify Team has brought the combination of Signify's huge industrial investment with Consolite specialist military focus. As a team we are providing connectivity to Naval ship operations which is revolutionising data use at sea.

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