

Optical Wireless Communication

Optical Wireless Communication (OWC) offers mobile high speed data transmission via light. The LED based systems use unregulated optical spectrum. As light does not pass through walls, enhanced security is achieved. Dense user scenarios, easy femtocell deployment and interference-free operation to existing radio wireless systems are possible.

OWC is well suited for numerous use cases like Industrial Wireless, Mobile Front- and Backhauling and Indoor Li-Fi.



LED

SECURE

HIGH SPEED

INTERFERENCE FREE

VISIBLE LIGHT COMMUNICATION - VLC

WIRELESS COMMUNICATION - OWC

Range of Products



Industrial Wireless

- Light source: any high-power LED
- Femtocell deployment for network densification
- High robustness due to dynamic rate adaptation
- Immunity to RF interference
- Low latency (< 2 ms)
- Universal RJ45 Ethernet Interface



Mobile Front- and Backhauling

- Infrared LED based
- 99.999% availability due to rate adaptation
- 500 Mbps over 100 m, peak data rate up to 1 Gbps
- No active tracking needed
- Ethernet interface for easy network integration



Indoor LiFi

- Use of standard illumination LEDs
- No interference with existing Wi-Fi networks
- Multi-user access possible
- Peak data rate 1 Gbps
- Small form factor

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OPTICAL WIRELESS COMMUNICATION

LED

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Li-Fi

VISIBLE LIGHT COMMUNICATION - VLC

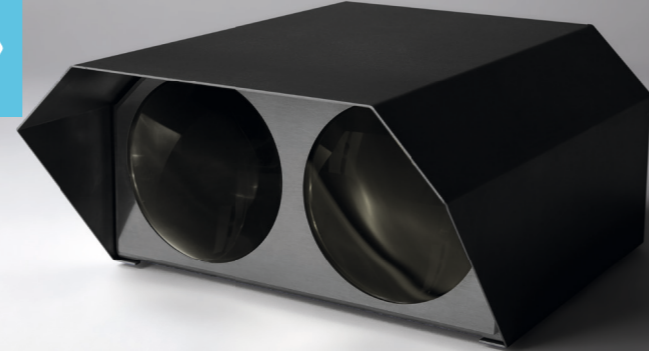
OPTICAL WIRELESS COMMUNICATION - OWC



Reference Project:

OWICELLS

In the OWICELLS project, Fraunhofer HHI develops new wireless technologies based on data transmission by light, together with partners from automotive, lighting and automation industry. Besides the development of hard- and software, the OWC technology is tested in real life production conditions.



Reference Project:

SANGIKYO CORPORATION

Fraunhofer HHI and Sangikyo Corporation (Japan) have jointly evaluated the potential of LED based OWC links for point-to-point communication. The commonly developed links are currently tested in Japan for different uses cases like building-to-building connections and small cell front- and backhauling.



Reference Project:

VLC MAINAU

The VLC Mainau project was launched in 2015 with the objective to use VLC technology in an existing conference room on the Island of Mainau. This VLC installation outside a laboratory environment is the first in Germany and one of the few field tests of this kind worldwide.

About

Industrial Wireless

For "Industry 4.0", where flexible manufacturing aims at personalized products, reliable and secure wireless communication with low latency is mandatory. Optical wireless communication (OWC) is a potential technology for these demands.

OWC uses light instead of radio, is robust against electromagnetic interference, does not penetrate through walls, is difficult to jam from the outside and inherently secure. Spatial diversity and coordinated networking will make OWC robust and reduce latency. All this makes OWC well suited for dense deployment in future factories.

Fraunhofer HHI offers tailored OWC solutions and provides high speed OWC links for industrial environments.



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Facts

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About

Mobile Back- and Fronthauling

5G as the next generation of mobile communication will enable new applications like the smart city, autonomous driving and the networked society. In order to fulfill 5G requirements on higher area capacity, reduced latency and a larger number of users, numerous small cells in addition to the already existing macro cells will be deployed. Economic front- and backhaul solutions are therefore needed. Through rate adaptation, LED-based optical links are more robust and offer higher throughput, besides easy alignment and immunity against electromagnetic interference.

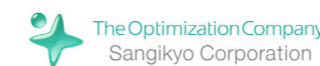
Fraunhofer HHI provides high speed OWC links with field-proven uninterrupted availability in challenging outdoor conditions.



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Indoor Li-Fi

Visible light communication (VLC), also called Li-Fi, is an interesting alternative for mobile communication via light. The already existing LED illumination infrastructure can be reused and new high-speed data transmission functionality is added. Li-Fi is considered as a promising technology for mobile indoor connectivity where the unlicensed optical spectrum is used. Light is better confined compared to radio and safer against unauthorized access and jamming. Secure high-speed light communication will enable new use cases especially in enterprise scenarios.

Fraunhofer HHI has more than 20 years of experience on indoor Li-Fi systems and provides compact VLC modules for immediate industrial prototyping and field tests.



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