LI-FI DEVELOPMENT JOURNEY

KEY FACTORS

What are the requirements?
- Physical Environment
- Transmission Distance
- Data Rate
- Alignment
- Interfaces

Which solution best fits requirements?
- Li-Fi GigaDock®
- Li-Fi HotSpot

Which components are most suitable for the requirements?
- Optics
- Transceivers
- Modules

How are Li-Fi modules quickly and successfully implemented?
- Interfaces
- Form Factor
- Environmental Conditions

How to purchase Li-Fi modules?

Consulting | **Concept** | **Hardware Design** | **Module Design** | **Li-Fi Module Supply**

SERVICES

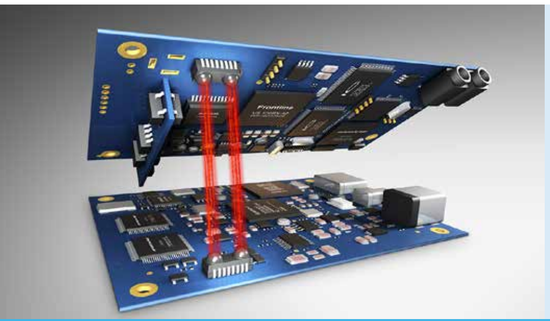
- Technology Consulting
- Requirement Workshops

- Feasibility Study
- Concept Design
- Proof of Concept
- Simulation
- Evaluation Kits

- Optic Design
- Transceiver Design
- Demonstrators & Prototypes

- Plug In Module Design
- Implementation consulting
- Sample Kits
- Design Review & Support

- Prototypes
- Pilot Series
- Technology Transfer



Li-Fi GigaDock® Evaluation Kits

Transceiver Type	Data Rate
GD-1G	≤ 1 Gbit/s
GD-5G	≤ 5 Gbit/s
GD-10G	≤ 10 Gbit/s

Li-Fi Hotspot Evaluation Kits

Transceiver Type	Data Rate
HS-100M	≤ 100 Mbit/s
HS-1G	≤ 1 Gbit/s

Data links for automated guided vehicles

Multiple parallel participants in a radio-based network can cause interference and ultimately affect the reliability of data links. Li-Fi provides wireless and secure data links for moving equipment without interferences to establish a reliable alternative solution to Wi-Fi links.

Data links for rotating machinery

Replacing slip rings with a GigaDock® optical link facilitates higher data rates and higher rotation speed. Contactless, non-abrasive data transmission minimizes wear and tear as well as the associated costs.

Replacement of RF based Infrastructures

High per-user data rates, bi-directional communication, and simple deployment makes the Li-Fi HotSpot an attractive alternative to Wi-Fi, benefiting public, private and industrial networks.

Machine to Machine Communication

Due to low latency, a Li-Fi communication channel is very well suited for machine-to-machine interaction. The system offers robustness and low energy consumption, as well as strong data security.

Cables and connector replacement

In many cases, wireless systems offer better reliability and security than provided by expensive special cables or connectors. Connectors can be mechanically fragile and contacts often become bent or loose. In addition, connectors can be plugged only a limited number of times.

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LI-FI – OPTICAL WIRELESS COMMUNICATION

Light Fidelity (Li-Fi) technology wirelessly transmits data via light using a transmitter to switch a light-emitting diode (LED) on and off so fast, that it is not noticeable by humans. A photodiode on the receiver side absorbs the light, and transforms it into electrical impulses. Li-Fi offers various benefits in comparison to RF-based communication:

- Quick wireless data transfer
- Real-time communication
- High data security due to necessary line of sight
- No interference

LI-FI HOTSPOT

Transmitting data over long distances, the Li-Fi HotSpot provides a suitable alternative to WiFi or cable networks. Like a WiFi hotspot, several users can simultaneously dial in to the network. Because light does not penetrate walls, a Li-Fi connection offers data security significantly better than that of RF-based network accesses.

- Data rate up to 1 Gbps
- Range up to 30 m
- Uni- and bi-directional, full-duplex
- Real-time capability
- Point-to-point, point-to-multipoint
- Cell-hopping / Roaming

LI-FI GIGADOCK®

The Li-Fi GigaDock® uses light to provide high-speed data links over short distances. In the context of Industry 4.0, it is a good fit for industrial applications. Due to its low latencies, Li-Fi GigaDock® can also be used in applications with real-time requirements.

- Data rate up to 12.5 Gbps
- Range up to 10 cm
- 360 ° rotatable
- Size down to 5x5x5 mm³
- Uni- and bi-directional, full-duplex
- Real-time capability with latency <1µs
- Point-to-point data transmission

LI-FI HANDS ON WORKSHOP

Attend a practical workshop at Fraunhofer IPMS in Dresden to understand the theoretical basics of optical wireless communication, discuss technology potential, and personally test various Li-Fi demonstrators.

Hands-On Session

» Configure Li-Fi data links
» Identify maximum data rates and transmission distances
» Determine which parameters particularly influence the performance of your application

We offer several dates throughout the year.

SHORT PROFILE

Based in Dresden, Fraunhofer IPMS is your research and service partner in the fields of optical sensors and actuators, integrated circuits, micro-systems (MEMS/MOEMS) and nanoelectronics. As one of the currently 72 independent institutes and research units making up the Fraunhofer-Gesellschaft, the leading European organization for near-industrial research, our more than 300 scientists work together with both private industrial and service companies as well as the public sector in projects to directly benefit business and society. To meet the high standards of our customers, Fraunhofer IPMS is certified by DEKRA in accordance with DIN EN 9001:2008 for the research, development and manufacturing of microsystems, respective semiconductor and microsystems processes as well as integrated actuators/sensors.

We support companies in realizing their innovative ideas in the field of wireless data transmission using Li-Fi solutions. Our services include technology consulting and simulation, as well as concept, hardware, and module design. We have extensive experience in application-oriented research and development, especially in the areas of analog and digital circuit design, optic design and module integration, in addition to protocol controller and electrical interfaces. Fraunhofer IPMS is therefore able to provide complete and comprehensive assistance from idea to prototype production and pilot series.

ASSOCIATIONS

Li-Fi Consortium

The Li-Fi Consortium is an international platform focused on optical wireless communication. Fraunhofer IPMS is a founding member.

industrial internet CONSORTIUM

The Industrial Internet Consortium is the world's leading organization for accelerating the Industrial Internet of Things (IIoT).

Fraunhofer IPMS

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LI-FI – OPTICAL WIRELESS COMMUNICATION