OPTICAL WIRELESS PROTOTYPING PLATFORM FOR REAL-TIME COMMUNICATION

Fraunhofer HHI

AT A GLANCE

Prototyping platform for real-time optical wireless communication with adaptable software protocol stack.

Features

- Optical wireless local area network
- Cellular system with mobility support
- Gross data rates up to 2 Gbit/s
- Latency below 2 ms with variation below 500 µs
- Targets industrial wireless communication
- Customizable prototype platform
- Protocols compatible with IEEE 802.15.13

Technical Background

Optical wireless communication (OWC) makes use of light to transmit data wirelessly.

Cellular OWC networks provide very high data density, cable-like quality of service over a line-of-sight connection, and a high degree of security.

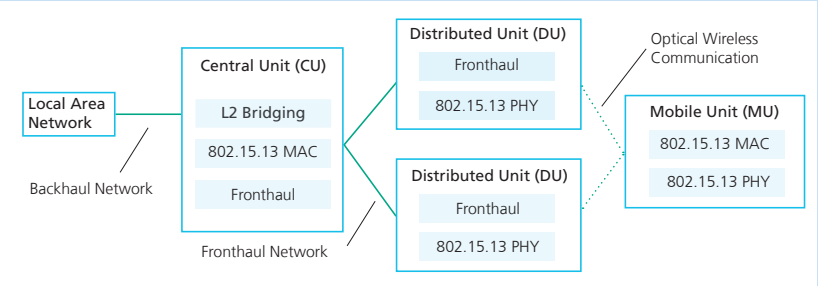
In contrast to radio networks, light networks are independent from spectrum regulation and do not require licensing.

OWC networks can augment industrial wireless networks to support highly flexible automation, e.g., through connecting mobile robots.

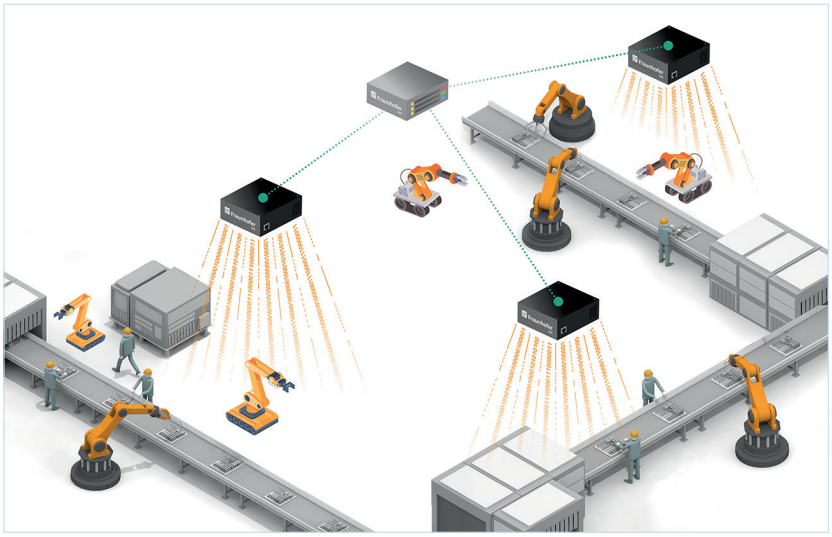
Fraunhofer HHI

Benefits

- Development and evaluation of cellular optical wireless networks
- Centralized network control in a central unit (CU) with distributed transceivers (DUs)
- Protocol support for real-time communication
- OFDM-based physical layer available as IP core for FPGA
- Source code available for customization
- Easy prototyping of new protocol functions
- Custom functionality for diverse applications upon request



Architecture of the Optical Wireless Prototype Platform



Application Scenario of the Optical Wireless Prototype Platform

Kai Lennert Bober

Photonic Networks and Systems

Phone +49 30 31002 414

info-pn@hhi.fraunhofer.de

Fraunhofer Heinrich Hertz Institute

Einsteinufer 37, 10587 Berlin

Germany

www.hhi.fraunhofer.de/en/realtime-owc

20251030