



Fraunhofer Institute for Integrated Circuits IIS

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Ultra reliable Wireless Industrial Network

Ultra reliable wireless technology for private industrial networks

Numerous industrial automation systems have sensors, actuators and other automation components located on movable subsystems. Tools on robot arms, slide rails, rotary tables and coordinate tables are examples of such subsystems. They often have to be connected to the overall control system ensuring very short cycle times.

The cable drag chains, rotary feedthroughs and slide contacts used for this purpose nowadays have numerous disadvantages. For instance, they limit the motion trajectories of the subsystems, the number of attachable automation components and the opportunities for future retrofits or extensions.

Competitive edge in manufacturing through wireless connection:

- Greater flexibility through unlimited motion trajectory
- Higher process quality through the use of additional sensors and actuators
- Better investment protection through cost-effective retrofitting and extensibility
- Improved process dynamics and precision through weight reduction of the movable subsystems
- Ease of assembly through smaller form factor

Highlights

- Integration in existing production facilities
- Integration of customized interfaces into gateway and I/O devices
- Customized extensions of the radio technology

To solve this problem, Fraunhofer IIS is developing UWIN (Ultra reliable Wireless Industrial Network), a radio technology that is deployable as a wireless extension or even as a substitute for wired fieldbuses. Compared to existing radio technologies, it enables superior real-time signal transmission with extremely short latency and maximum reliability.

Technical parameters of the wireless technology:

- Radio system with gateway to legacy fieldbus systems and several I/O devices
- Isochronous transmission with a minimum guaranteed cycle time of 125 μ s
- Number of I/O devices per network: up to 100
- User data rate per I/O device: up to 2.24 Mbps
- Range: up to 20 m
- Maximum reliability as per requirements in the industrial sector
- Universal applicability (EU, Asia, USA)