PRESS RELEASE

Long-distance, energy-efficient and robust – sensor data transmission in the Industrial Internet of Things

Nürnberg/Hannover Messe HMI, Hannover:
At Hannover Messe, the Fraunhofer Institute for Integrated Circuits IIS is presenting MIOTY®, the wireless transmission technology for applications in the Industrial Internet of Things (IIoT). Thanks to a reliable, robust process, this system can transmit data from several hundred thousand sensors over long distances securely, efficiently and with low power consumption. It is ideally suited to applications such as remote monitoring of large industrial facilities, buildings or company grounds as well as to smart city solutions. MIOTY® is a hardware-independent software solution that was incorporated into the European Telecommunications Standards Institute (ETSI) standardization for low-throughput networks. The Fraunhofer experts are demonstrating the licensable MIOTY® technology on the latest hardware components as a monitoring solution for industry.

Connectivity and communication via sensors and efficient human-machine communication are essential aspects of Industrie 4.0 scenarios and the Industrial Internet of Things. In order to collect and analyze meaningful data and prepare it for further processes and actions, a wide range of objects, machines and people need to be equipped with sensor systems.

MIOTY® technology for connecting and transmitting sensor data in the IIoT

Many branches of the IIoT are concerned with reliable condition monitoring of facilities and production processes and with predictive maintenance. These issues have been particularly hard to deal with to date in the complex environments of industrial facilities and outdoors. With MIOTY® technology from Fraunhofer IIS, based on a patented telegram splitting method, this is about to change: the technology guarantees interference-resistant wireless data transmission for several hundred thousand sensors and reception across several kilometers at a gateway. MIOTY® can be (retro)fitted in commercial and industrial environments, and the network density can be gradually increased with additional sensors. Thanks to a software-based technology approach, it can be used in conjunction with various hardware components, such as commercially available sub-GHz transceiver chipsets. Thanks to energy-efficient transmission

technology, this low-power wide area network (LPWAN) guarantees long service lives for the sensors.

MIOTY® in action using oil & gas applications as an example

Long-lasting, interference-free data transmission is incredibly important for applications in the oil & gas sector. In these large industrial facilities, sensor data needs to be transmitted reliably even in the face of possible interference from other wireless systems or from the building and any metallic structures. This is something standard wireless networks cannot always guarantee. MIOTY® technology from Fraunhofer IIS offers a solution: using the free 868 MHz frequency band, data is sent in a star topology directly from individual nodes to the central base station. Usually, only small amounts of data – e.g. temperature readings – need to be transmitted; this can be done extremely energy efficiently. MIOTY® was designed specifically for what are known as massive IoT applications involving several thousand small end devices, for example to enable efficient remote maintenance of plant and equipment.

Standardized transmission method for connecting thousands of sensors

MIOTY® is a technology that was incorporated into the European Telecommunications Standards Institute (ETSI) standardization for low-throughput networks protocols for radio interface A. Since 1988, ETSI has been tasked with creating standards for telecommunications and broadcasting. It has members from across the industry, as well as independent research and development bodies. The standardized method guarantees users a generally recognized basis for developing new services and solutions, ensuring that different IIoT systems and solutions can interact with each other.

Getting started in the IIoT with the MIOTY® Evaluation Kit

Fraunhofer IIS has developed the MIOTY® Evaluation Kit as a way for users to implement the technology quickly and seamlessly. It comprises all the key components for setting up a network, including a base station equipped with MIOTY® technology, various sensor nodes and antennas. This means initial test systems can have a wireless MIOTY® network of their own to transmit sensor data from a large number of sensors to a base station and connect to further hardware.

MIOTY® technology as a license – cooperation with Behr Technologies Inc.

As worldwide license holder for MIOTY® technology, Fraunhofer has partnered with Behr Technologies Inc. (BTI) to bring this technology to market. BTI guarantees

worldwide service and support for MIOTY® and works closely with system integrators, solution providers, hardware manufacturers and cloud providers to deliver MIOTY® communication for a wide variety of Industrial IoT solutions. The first range of products will be launched this year.

You can find MIOTY® at Hannover Messe on the joint Fraunhofer booth, Hall 2 C22.

IN COOPERATION WITH
Behr Technologies BTI Inc.

The Fraunhofer-Gesellschaft is the leading organization for applied research in Europe. Its research activities are conducted by 72 institutes and research units at locations throughout Germany. The Fraunhofer-Gesellschaft employs a staff of 25,000, who work with an annual research budget totaling more than 2.3 billion euros.
The **Fraunhofer Institute for Integrated Circuits IIS** is one of the world's leading application-oriented research institutions for microelectronic and IT system solutions and services. It is the largest of all Fraunhofer Institutes. Research at Fraunhofer IIS revolves around two guiding topics:
In the area of **"Audio and Media Technologies"**, the institute has been shaping the digitalization of media for more than 30 years now. Fraunhofer IIS was instrumental in the development of mp3 and AAC and played a significant role in the digitalization of the cinema. Current developments are opening up whole new sound worlds and are being used in virtual reality, automotive sound systems, mobile telephony, streaming and broadcasting.
In the context of **"cognitive sensor technologies"**, the institute researches technologies for sensor technology, data transmission technology, data analysis methods and the exploitation of data as part of data-driven services and their accompanying business models. This adds a cognitive component to the function of the conventional "smart" sensor.
970 employees conduct contract research for industry, the service sector and public authorities. Founded in 1985 in Erlangen, Fraunhofer IIS has now 14 locations in 11 cities: Erlangen (headquarters), Nuremberg, Fürth, Dresden, further in Bamberg, Waischenfeld, Coburg, Würzburg, Ilmenau, Deggendorf and Passau. The budget of 184 million euros is mainly financed by projects. 22 percent of the budget is subsidized by federal and state funds.
Detailed information on: www.iis.fraunhofer.de/en