

# NETWORKS AND IDENTIFICATION



# YOUR REPUTABLE PARTNER FOR WIRELESS COMMUNICATION, NETWORKS AND IDENTIFICATION

## COMMUNICATION AT THE HIGHEST LEVEL

As an international partner in research and development, we offer you customized solutions in hardware and software for wireless communication and identification as well as comprehensive consultation.

### Your project will benefit from:

- Extensive technology expertise
- Expert consultation for applying communication and network technologies
- Practical utilisation of existing technologies
- Customized technology development and targeted technology adaptation

### Application areas

#### INDUSTRY 4.0

- Process digitization
- Predictive maintenance
- Smart Objects

#### LOGISTICS

- Supply Chain Management
- Wireless order picking systems
- Intelligent containers

#### SECURITY

- Catastrophe management
- Communication solutions for authorities and organizations that perform emergency and security services

#### SMART CITY

- Internet of Things (IoT)
- Intelligent cities
- Smart buildings



## OUR TECHNOLOGIES

### **MIOTY® – Low power wide-area networks**

For large-scale data transmission, we offer MIOTY®, robust, wireless IoT technology that is setting new standards with regard to cost efficiency, transmission security (with coverage up to 15 kilometers), and battery life. It is used to monitor large production facilities and entire city districts, for example.

### **s-net® – Wireless sensor networks**

Our solutions for self-organized, bi-directional, multi-hop communication with positioning enable wireless-based applications such as wireless asset management, local process control in production, locating people, monitoring logistics chains, and Smart City applications. s-net® also offers power-efficient accessibility to all nodes with easy and flexible installation and maintenance-free operation.

### **Robust wireless communication**

We offer robust wireless technology for professional use. Our technologies can be used internationally, offer a high degree of protection from disturbances, simultaneous data and voice communication, and great security with regard to wiretapping with encrypted transmission.

### **Intelligent objects**

For complete digitization of value-added chains and for assistance systems in assembly and production, we offer intelligent objects that can record their application and environmental situation, influence the situation interactively together with users, and precisely control its behavior depending on the situation. The possibilities range from intelligent workpiece carriers to intelligent transport containers and on to intelligent parameter determination in assembly.

### **RFID systems**

We offer consultation and technical feasibility analyses as well as economic evaluations for using RFID. We evaluate RFID systems in special application areas, e.g. in the area of metals, and we carry out reliability testing with the most advanced measuring technology.

Moreover, we develop both complete and partial RFID systems. In this context, the combination with sensor technology, the integration of RFID in metals and plastics, and the integration of wireless power and data transmission play an important role.



## YOUR EXPERT PARTNER

The Positioning and Networks Division develops wireless communication, localization and identification technologies for digital, networked applications in markets such as production, logistics, security, mobility, and sports/fitness. Systems for an efficient power supply and optimum and secure power management add to the technology and system range.

Together with the working group for Supply Chain Services (SCS), we create future-oriented technologies and applications for the Internet of Things, Industry 4.0, and networked mobility. The foundation is communication, positioning, and sensor technology with local application logic and process knowledge on mobile platforms and in cyber-physical systems (CPS). With these developments, working processes in production and intralogistics can be designed to be more efficient, and production data can be collected and evaluated.

At the Nürnberg location, 180 scientists are currently working in the Positioning and Networks Division as well as in the working group for Supply Chain Services. With the new building, Fraunhofer has had ideal development and testing environments since 2016. The range of offerings extends from studies, consultation, research and development contracts, and technology licensing to the development of prototypes ready for practical use and supervised market introduction. Furthermore, the Test and Application Center L.I.N.K. provides a realistic development and evaluation environment close to application conditions for future-oriented technologies and services. With 1,400 m<sup>2</sup> of indoor and laboratory space, 10,000 m<sup>2</sup> of outdoor space, and a 100 m test track, current network and identification technologies can be evaluated and compared with each other with respect to their usability.

Applications in sports, fitness, and Smart City/Smart Home use these technologies as well for efficient information transmission. Secure and flexible power management applications for controlling power consumption in buildings, energy harvesting solutions, and intelligent battery monitoring increase system service life and regulate electricity consumption efficiently and according to demand in networked environments. Special security concepts ensure trouble-free communication and protected access to collected data within buildings and production.



## SERVICES

Our service portfolio includes customized system solutions in hardware and software for wireless communication, networks, and RFID.

- Consultation and concept development
- Hardware and software development, including technology testing, implementation, integration
- Wireless measurements
- Technology evaluation and monitoring
- Wide spectrum of communication technologies
- More than 20 years of experience in the area of wireless communication and identification
- Worldwide unique Test and Application Center L.I.N.K.
- The expertise of more than 50 computer scientists, electrical engineers, and business economists
- Solid application experience in areas such as production, logistics, security, Smart City and Smart Building

## WE MAKE NETWORKS AND IDENTIFICATION INTELLIGENT

Network and identification technologies for machines, components, and people close the gap between IT and the real world and provide benefits for a broad range of Industry 4.0 and IoT applications. With our technology, we create a sound basis for following this trend. Our consultation, which is not manufacturer-specific, can support you in the successful development of services as well as in their implementation with the appropriate technology.

We offer you solutions, from intelligent objects to cyber-physical systems (CPS) for digitizing your processes. With unique technologies and comprehensive expertise, we provide guidance from customized requirements analysis and definition of objectives to system application.

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