



## Expertise

- In our activities in the range of wireless technologies we focus on short range networks. National 868 / 915 MHz and international 2,4 GHz frequency bands are supported.
- We use different chip sets of different manufacturers.
- According to the respective requirements both ceramic and circuit board antennas are used. We utilise product-specific, customized and standard antennas.



## References

### Automation

- Mobile controlling and administration of the removal of liquids and bulk materials
- Wireless sensor network for recordation of environmental data (temperature, humidity, brightness)

### Building automation

- cross-linked entrance system with access control over smart card

## Applications

- Tracking of persons and devices
- Building automation
- Industrial remote control
- Wireless sensors
- Remote monitoring

## Achievements

### Hardware and Software development

The experiences of our engineers cover simple Peer-to-Peer applications as well as complex networks. In every development phase the communication to our customers is important for us. Our advantage is the close collaboration of the engineering department with manufacturing area. This enables us to create high quality products and comprehensive documents for manufacturing and service.

### Production and Testing

We have established the complete product creation chain starting with product design followed by prototyping, testing, verification and serial production.

Our production area has the capability to handle more than 300.000 components per day. All the electrical parameters and the performance of radio communication of our products are tested in the in-house test area. Our own engineering department "Test Systems" provides best solutions for the required test equipment.



Automatic test systems for testing of electrical and radio-relevant parameters

## Perfect Solutions

Radio networks offer the full comfort of wireless connectivity, expensive cable installations are no longer needed. The wireless network must be easy to install, has to assure a robust and reliable communication and the separate nodes have to work battery driven over years. We prefer **solutions for low-cost and low-power embedded applications** in comparison with other existing radio technologies.

### LR-WPANs (Low Rate Wireless Personal Area Network )

These networks are developed especially for sensors and actuators and have the ability of self-configuration, redundancy in the transmission line and they realize the extension of the transmission range through multi-hops.

Data rates are between 20 and 250 kbit/s. To allow coexistence with other wireless technologies, CSMA/CA for collision avoidance is consistently used.

### ZigBee-Standard

Using the ZigBee standard these advantages can be realized with low data volume. The devices have a low current consumption. With two batteries type AAA a radio node reaches an operational period of several years.

Typical ranges of a single ZigBee-node are 20 to 50 m within buildings.

### Proprietary

Suitable proprietary solutions can be used, if the existing standards do not meet the requirements.