

One antenna – a wide range of applications

- Industry 4.0 and smart logistics: goods detection and allocation in logistics and manufacturing
- Supply chain management: asset tracking and condition monitoring, e.g. for cold chain monitoring with RFID sensors
- Smart agriculture: harvest, livestock and infrastructure monitoring
- Person monitoring: electronic access control and patient monitoring
- Goods and traffic surveillance: product piracy protection, anti-theft applications and toll collection

The Fraunhofer IIS – your partner for antennas

Consulting and development

We carry out requirements analyses and technical and economic feasibility studies that serve as the basis for the development of antenna solutions that fit your needs.

System integration

We can help you plan the launch of a new system or integrate the Multibeam Antenna solution into an existing system. Our services range from design to commissioning.

Licensing

Depending on your business model, we offer customized technology access: We bring you in contact with appropriate manufacturers and distributors or offer suitable licensing options for your own in-house production or contract manufacturers.

Fraunhofer Institute for Integrated Circuits IIS

Management of the institute
Prof. Albert Heuberger (executive)
Prof. Bernhard Grill
Prof. Alexander Martin

Am Wolfsmantel 33
91058 Erlangen, Germany

Phone +49 9131 776-0
info@iis.fraunhofer.de
www.iis.fraunhofer.de

Contact
Communication Systems Division
communicationsystems@iis.fraunhofer.de



Multibeam Antenna
for RFID applications in
the UHF range



Smart RFID antenna

For the whole process chain

The Multibeam Antenna: Extensive. Precise. Accurate positioning.

Smooth process flows – just in time – at low costs and highest efficiency. The Multibeam Antenna is suited to meet these requirements by contributing substantially to the digitalization of processes. It enables the contactless detection of objects using radio frequency identification (RFID) technology in the ultra-high frequency (UHF) range. With its extended field of view, this powerful RFID antenna ensures higher scanning rates and more accurate positioning than conventional solutions.

The Multibeam Antenna can be used to speed-up processes in a wide range of industries, from manufacturing and logistics to retail. The antenna enables a precise, automatic detection and allocation of materials, components and products allowing for tracking of goods along the entire value chain.

Smart antennas for RFID applications

RFID – a key technology in Industry 4.0 – offers a cost-effective way to label and automatically identify objects by furnishing them with transponders referred to as RFID tags. Reading stations are used to capture and process the information stored in the tags, which can be reliably and rapidly scanned by coupling them with special RFID antennas such as the Multibeam Antenna.

The benefits at a glance

Precise detection

- Multibeam Antenna providing up to nine beams for illumination
- Unique in the RFID sector: beams can be steered in accordance with the position of the objects to be detected
- Beamforming allows for higher reading rates and lower read error rates

Maximum reliability

- Extended field of view thanks to flexible beams
- High switching speed
- Quasi-simultaneous scanning of large numbers of transponders
- Reliable detection, even in difficult environments such as identifying metal or concealed objects or running large bulk reading applications

Direction and positioning

- Capture of directional information and changes
- Storage environments: capability to differentiate between incoming and outgoing goods as well as moving and stationary objects
- Precise positioning through 3D scanning

Standardization and compatibility

- Standard 860 MHz to 960 MHz RFID frequency range
- Globally applicable
- Integration into existing identification systems possible
- Compatibility allows for cutting-edge solutions in logistic applications all over the world

Simple handling

- Optimal coverage of the desired scanning areas with a minimal number of antennas
- Miniaturized components ensure a space-saving, lightweight design
- Conventional RF coaxial cabling
- Minimal installation and maintenance effort

Technical data

UHF Multibeam Antenna with integrated feed network

- Frequency range: 860–960 MHz
- Globally applicable according to EPCglobal Gen2 international RFID standard

Flexible scanning range

- Up to nine adjustable beams
- Right-handed circular polarization
- Vertical (elevation): 60° (beams 1–8) / 90° (beam 9)
- Horizontal (azimuth): 0° / 45° / 90° / 135° / 180° / 225° / 270° / 315°

Interfaces

- RF interface: TNC-RP
- Control interface: USB, RS232/422