Fraunhofer
IIS

FRAUNHOFER INSTITUTE FOR INTEGRATED CIRCUITS IIS

RFID – TECHNOLOGY AND APPLICATION

FRAUNHOFER IIS RFID SOLUTIONS

A key competency at Fraunhofer IIS is RF technology. Currently almost 50 scientists work on tomorrow's wireless technology. We could already persuade many small and large companies of our innovative power in the areas of antennas, wireless communication and positioning. The group for wireless communication provides Radio Frequency Identification (RFID) solutions. RFID facilitates reading out data stored on a microchip, such as identification numbers, using radio waves. Unlike the barcode system, the RFID technology is much more flexible and offers crucial advantages.

You're looking for solutions to e.g.

– capture a pallet of 1000 individual products with a single quick read?
– control or keep track of a product going through several steps in a logistics or production process and to be automatically updated on its current state?
– read out RFID transponders mounted at hard-to-reach places?
– increase the efficiency of your current read/write stations or your RFID transponders?
– reduce your costs by reusing electronic tags?
– gain process flexibility by saving information on the object?

You've looked for RFID technology for your specific application and you haven't found one? Fraunhofer IIS develops what you need.
We provide individual sophisticated solutions for new complex tasks.

In the field of RFID our successful products speak for themselves. We take a lead in various projects with renowned industry partners using our 15 years of experience and competence. Fraunhofer IIS offers an established hardware-design flow from simulations and layout to PCB production and mounting. We work with the most advanced measurement equipment, special motion units and, as of 2011, we are able to simulate real application scenarios for you in our own test centre.

RFID - Sophisticated wireless identification technology
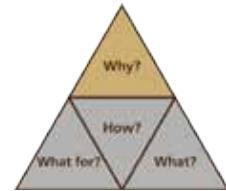
Why Fraunhofer IIS is the perfect fit for your RFID project?
Let us convince you!

RFID FUNCTIONALITY

RFID technology allows data communication between the read/write unit and an RFID transponder applied to an object. An integrated IT system processes the read out data.

Electronic tags can also store information. A typical RFID tag consists of a microchip attached to an antenna and a base or case. The data exchange is initiated by the read/write unit, which sends electromagnetic waves to activate the RFID transponder. The tag stores the received information and sends it back to the reader when required.

There are active and passive RFID tags.

Passive RFID transponders collect their operating energy from an electromagnetic field generated by the reader and therefore have limited range of a few meters.
Active tags are self-powered and have ranges up to 100 meters. They do, however, have a limited life span and tend to be more expensive than passive tags.

RFID TECHNOLOGY: KEY FEATURES

RFID is faster, more resistant and more cost-effective than any other available technologies.

Be flexible!
An RFID reader simultaneously reads several hundred RFID transponders through bulk data capture. The mounting options on your objects are arbitrary. Line of sight is not required and the range can be up to 100m.

Stay on top!
A product can store its own production history. The data content of the electronic tags is permanently updated throughout the process and seamless tracking becomes possible.
Invest smart!

The RFID transponders are rewriteable and can therefore, unlike barcodes, be reused. They are very resistant to soiling and mechanical impacts. Furthermore, international standards ensure long-term availability of independent and cost-effective RFID technology.

What makes RFID superior to common methods? What can Fraunhofer IIS RFID technology do for you?

RESEARCH AND DEVELOPMENT

Development of your RFID Transponder

All over the world scientists are involved in the development of RFID technology with the aim to not only identify objects but to gain information on their location and condition. This matching our broad technological background, we develop customer specific transponders. The spectrum ranges from special antenna design to a complete RFID chip design. For instance, with a special antenna design the RFID technology can be mounted onto or embedded into metal. Fraunhofer IIS translates its latest scientific insights into practice-oriented developments:

Combination of sensor technology and RFID technology

Via the RFID interface a sensor can be supplied with power and transmit data. Should the sensor be able to permanently collect data, an energy source, e.g. a battery or an accumulator, is required. With the charging interface of Fraunhofer IIS the sensors can not only be supplied with energy but the accumulators can also be recharged. This wireless power supply works inductively and is a so-called energy harvesting technology.

Positioning via RFID

RFID technology can be used to provide positioning information. When an object fitted with a transponder is within radio range of a reader, the object is allocated to the position of the reader and localized. By using active transponders with longer ranges and corresponding positioning methods, objects can be localized with blanket coverage and higher accuracy.

APPLICATIONS

Logistics – seamless tracking

RFID transponders bridge the gap between the physical flow of goods and the overall corporate flow of information. Transponders on packages store logistical information like destination, time of arrival or contents, and simplify seamless tracking during transit. In the future, RFID promises to empower objects to be self-controlled. Large containers with active tags might be able to autonomously inform the forklift in which hall they are to be stored. The pharmaceutical industry can combine RFID tags with temperature sensors, to continuously monitor a drug's temperature history.

Production – manufacturing help and on-site service

RFID can be used in manufacturing to track and trace product components at any time. Manufacturers are able to manage product recalls with a greater degree of responsiveness, knowing

exactly the place, time and even machine that had caused an assembly error. On-site engineering is easier with RFID. Everybody involved has the information exactly which component has to be exchanged, can react promptly and save time and keep costs down. The vision to track an item's journey from manufacturing to the consumer until the item is recycled becomes reality with RFID. Transponder integrated into tools and tool parts allow the exact allocation to the product.

Counterfeit protection – unique identification
Transponders containing a serial number are associated with high-value products. The product can be uniquely identified and therefore distinguished from counterfeits. To ensure safety, the transponder is connected inseparably with the component.

Games – intelligent pieces
RFID technology could be the input interface for games. The electronic helpers capture the moves of the players on a board and transmit them to the computer. Games over e. g. the Internet become possible. New ideas for games can be found with pieces fitted with an RFID transponder.

Access control – authorized personnel only
Especially corporate access control, but also access control in soccer stadiums, public transportation or toll systems are relevant applications for RFID. Costs are cut back through flexibility and multiple use. RFID technology also increases misuse prevention.

Asset management – always at hand
RFID supported corporate asset management allows optimizing inventory like tools, aids and appliances or measuring instruments as well as their service and maintenance. It captures all stages of inventory movement including a detailed history on the location and user of each unit. This way, operations can be controlled and optimized in terms of cycle times, quantity, quality and the costs and investment involved   .
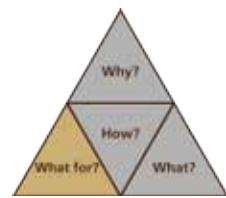
By helping to optimize processes the electronic labels have been spreading throughout numerous branches in countless applications

FRAUNHOFER IIS SERVICES

Meet your requirements.
Create your own.

FRAUNHOFER IIS MAINTAINS VARIOUS PROJECTS WITH RENOWNED INDUSTRY PARTNERS AND GOVERNMENT AID.

FOLLOW LUFTHANSA TECHNIK LOGISTIK WHO MADE IT OUR TASK TO PROVIDE AIRCRAFT PARTS WITH RFID TECHNOLOGY, THEREFORE ALLOWING RFID TO OPTIMIZE LOGISTICS AND MRO (MAINTENANCE, REPAIR AND OPERATION) PROCESSES.

OR BECOME PARTNER IN PRESTIGIOUS PROJECTS LIKE:

WITRACK®
THE SYSTEM FACILITATES WIRELESS POSITIONING OF FOOTBALL AND PLAYERS IN REAL TIME. THE BALL CAN BE CHARGED AND PROGRAMMED WIRELESSLY VIA THE RFID INTERFACE.

SEE YOUR RESEARCH BECOME REALITY!

THE PROJECT PARTNERS OF MOBILE SERVICEWELTEN TESTED, DEVELOPED AND RESEARCHED ON POTENTIAL APPLICATION FIELDS FOR ON-SITE ENGINEERING SERVICE WORLDWIDE. MAIN PROJECT FOCUS WAS THE AUTOMATED COLLECTION OF STRATEGIC AND OPERATIVE INFORMATION THROUGHOUT THE ENTIRE MACHINE LIFE CYCLE. THIS PROJECT WAS FUNDED BY THE GERMAN FEDERAL MINISTRY OF ECONOMICS AND TECHNOLOGY.

WE CREATE YOU AN INDIVIDUAL OFFER!

ALL OUR SERVICES ARE STANDALONE AND THUS CAN BE BOOKED SEPARATELY.
WHETHER YOU WISH SOLELY TECHNOLOGICAL CONSULTING, AN IMPROVEMENT OF A SINGLE WORK PROCESS OR A COMPLETE PRODUCT DEVELOPMENT FOR YOUR APPLICATION - IT IS YOUR DECISION!

CONSULTING

BASED ON SCIENTIFIC METHODS AND YEARS OF EXPERIENCE WE ANALYZE YOUR NEEDS, SELECT THE RFID SOLUTION THAT MEETS YOUR SPECIFIC GOALS AND OFFER SUPPORT FOR ECONOMIC AND TECHNICAL FEASIBILITY STUDIES. TO BETTER PLAN YOUR INVESTMENT DECISIONS OUR EXPERTS PROVIDE RECOMMENDATIONS FOR ACTION TAILORED SPECIFICALLY TO YOUR COMPANY.

EVALUATION

THE SUCCESSFUL RFID IMPLEMENTATION REQUIRES A THOROUGH EARLY-STAGE ANALYSIS TO ENSURE TECHNICAL FEASIBILITY. FRAUNHOFER IIS EVALUATES EXISTING RFID SYSTEMS WITH REGARD TO RELIABILITY AND PERFORMANCE OR DEVELOPS ENTIRELY NEW SOLUTIONS AS PER YOUR REQUEST.

WE ADDRESS INDIVIDUAL REQUIREMENTS PROMPTLY AND WITH PROFICIENCY.

REALIZATION

WE HELP YOU TO MEET YOUR EXPECTATIONS. SUITED TO YOUR SPECIFIC APPLICATIONS THE MOST EFFICIENT RFID SYSTEM WILL BE PROVIDED, INSTALLED ON SITE AND CONFIGURED BY FRAUNHOFER IIS.

PLEASE DO NOT HESITATE TO CONTACT US.

For more information about RFID, please visit

WWW.IIS.FRAUNHOFER.DE