

FRAUNHOFER INSTITUTE FOR INTEGRATED CIRCUITS IIS

PRESS RELEASE

PRESS RELEASE

March 31, 2014 || Page 1 | 3

Industry 4.0: Wireless Communication, Positioning and RFID Combined to Create Intelligent Forklift

Forklifts that choose efficient routes, pallets that reliably arrive at the right place and in the right condition, products and machines that communicate among themselves – that is the vision behind Industry 4.0. Scientists at the Nuremberg branch of the Fraunhofer Institute for Integrated Circuits IIS have moved closer to achieving that vision: By combining several positioning technologies and new communication technologies, they have created an intelligent forklift. HANNOVER MESSE (April 7 to 11, 2014) will see the forklift used to showcase technologies for Industry 4.0 at Booth D30/1 in the Wireless Pavilion in Hall 8.



New applications for Industry 4.0 demand pioneering technologies and technology combinations. Fraunhofer IIS has combined several positioning technologies, two of which were developed at the institute, to create a forklift equipped for Industry 4.0.

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Intelligent Combination of Technologies

René Duenkler, who is in charge of technology marketing at Fraunhofer IIS, explains: "To achieve what's needed for Industry 4.0, it's essential to combine new technologies in intelligent ways: Communication systems, RFID, positioning technologies and sensor networks all merge to create applications for use in industrial environments."

PRESS RELEASE

March 31, 2014 || Page 2 | 3



Keeping updated about the condition of goods and products is made easy by intelligent objects and a supply chain integrity system based on Fraunhofer IIS's s-net technology.

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And this is how the forklift works: The data needed to determine the vehicle's exact current position is provided by BlackFIR and awiloc, both of which were developed by Fraunhofer IIS, as well as GPS and inertial navigation. This forms the basis for a range of applications. For instance, all available routes can be displayed on a tablet for the benefit of the driver, with the best option highlighted. RFID and telemetry are used to integrate the forklift with its environment. RFID technologies, which can be embedded even in metal or fiber-reinforced composites, ensure reliable identification. Wireless power transmission and sensor networks are also possibilities. Additionally, the condition of goods and products can be continuously monitored using intelligent objects and a supply chain integrity system based on the s-net technology developed by Fraunhofer IIS. "The forklift knows and communicates its position, which is a major step towards

FRAUNHOFER INSTITUTE FOR INTEGRATED CIRCUITS IIS

achieving production processes that are at once self-organizing and transparent,” says René Duenkler of Fraunhofer IIS.

PRESS RELEASEMarch 31, 2014 || Page 3 | 3

The intelligent forklift will be used to demonstrate technologies for Industry 4.0 at HANNOVER MESSE from April 7 to 11, 2014. You can find it at Booth D30/1 in the Wireless Pavilion, Hall 8.

The **Fraunhofer-Gesellschaft** is the leading organization for applied research in Europe. At present, the Fraunhofer-Gesellschaft maintains 67 institutes and independent research units. The majority of the more than 23,000 staff are qualified scientists and engineers, who work with an annual research budget of 2 billion euros.

Founded in 1985, **Fraunhofer Institute for Integrated Circuits IIS** in Erlangen, Germany, ranks first among the Fraunhofer Institutes concerning headcount and revenues. As the main inventor of mp3 and universally credited with the co-development of AAC audio coding standard, Fraunhofer IIS has reached worldwide recognition. In close cooperation with partners and clients the Institute provides research and development services in the following areas: Audio & Multimedia, Communications Systems, Energy Management, IC Design and Design Automation, Imaging System, Medical Technology, Non-destructive Testing, Positioning, Safety and Security Technology, Sensor Systems plus Supply Chain Management.

More than 830 employees conduct contract research for industry, the service sector and public authorities. Fraunhofer IIS with its headquarters in Erlangen, Germany, has further branches in Nuremberg, Fuerth, Wuerzburg, Ilmenau, Dresden, Bamberg, Deggendorf und Coburg. The budget of 108 million euros is mainly financed by projects. Less than 25 percent of the budget is subsidized by federal and state funds.

Detailed information on www.iis.fraunhofer.de.