

PRESS RELEASE

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European Consortium Demonstrates Ultra-High Throughput Transmission over Satellite

Erlangen/Holzkirchen/Berlin, Germany: A consortium consisting of the Fraunhofer Institute for Integrated Circuits IIS, WORK Microwave and AVANTI Communications recently completed highly successful over-the-air trials on Avanti HYLAS satellite capacity employing the latest DVB-S2X modulator and demodulator equipment. The demonstrations used wideband carriers exploiting full transponder bandwidth and outperforming the target throughput of more than one gigabit per second (1 Gbps) using a single communication carrier. The technology demonstration was part of a development funded by the European Space Agency (ESA) under the "ARTES Advanced Technology" program.

The experiments demonstrated a variety of carrier bandwidths and modulation schemes. This included closing the forward link with a 480 MHz carrier and successfully receiving and demodulating this signal on the ground. The sustained throughput to a single end-user terminal was measured at 1.27 Gbps, leveraging from the DVB-S2X time slicing capability that allows the receiver to selectively skip and ignore parts of the incoming signal and thus save on processing power. DVB-S2X as the latest satellite communication standard allows for exceptionally efficient use of spectrum.

Fraunhofer IIS teamed up with WORK Microwave and Avanti Communications to implement a DVB-S2X wideband transmission system over satellite, including modulator and demodulator. Fraunhofer IIS and WORK Microwave were actively involved in the development, specification and validation of DVB-S2X, from standardization work to the implementation. Fraunhofer IIS developed a DVB-S2X receiver IP, which was used for the technology demonstration. WORK Microwave develops and manufactures satellite communication equipment and developed a high-performance wideband DVB-S2X modulator, which was used for the communication on the uplink.

The FPGA-based, modular design of modulator and demodulator enables different products and throughput ranges, up to the maximum spectral efficiency supported by DVB-S2X on wideband carriers. UK-based AVANTI Communications provided engineering support and HYLAS Ka-Band transponder capacity for the live demonstration. The activity was sponsored by ESA under the ARTES Advanced Technology contract "Ultra-high throughput transmission through wideband Ka transponder".

Head of Corporate Communications

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“By using DVB-S2X waveforms and our wideband ground equipment the capabilities of high throughput satellites can be fully exploited. This gives satellite operators the future perspective to meet the growing bandwidth demands of broadband applications”, said Thomas Fröhlich, CEO of WORK Microwave.

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“It has been a tremendous team effort developing this DVB-S2X enabled broadband technology and putting all pieces together to demonstrate such a high throughput system”, said Michael Schlicht, Head of Communication Systems Division, Fraunhofer IIS. “We are very pleased seeing it now working live and flawlessly on an actual satellite.”

“This trial confirms the excellent performance of our fleet of satellites when using the DVB-S2X waveform and state-of-the-art ground equipment. We are keeping a close eye on such wideband technologies to ensure we can meet the future bandwidth demands of broadband users”, said an AVANTI Communications spokesman.

“The successful demonstration of this next-generation technology confirms the innovation-led competitiveness of the European space industry and the capabilities of the European satellite fleet, as well as the importance of the “ARTES Advanced Technology” program to fund such developments”, says Nikolaos Toptsidis, the Technical Officer managing the activity on behalf of ESA. “The DVB-S2X air interface standardized by ETSI offers highest spectral efficiency, allows time slicing operation and supports very low roll-offs.”

The **Fraunhofer-Gesellschaft** is the leading organization for applied research in Europe. Its research activities are conducted by 69 institutes and research units at locations throughout Germany. The Fraunhofer-Gesellschaft employs a staff of 24,500, who work with an annual research budget totaling more than 2.1 billion euros.

The **Fraunhofer Institute for Integrated Circuits IIS** is one of the world’s leading application-oriented research institutions for microelectronic and IT system solutions and services. It ranks first among all Fraunhofer Institutes. With the creation of mp3 and the co-development of AAC, 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 and Media Technologies, Imaging Systems, Energy Management, IC Design and Design Automation, Communications, Positioning, Medical Technology, Sensor Systems, Safety and Security Technology, Supply Chain Management and Non-destructive Testing. More than 900 employees conduct contract research for industry, the service sector and public authorities. Founded in 1985 in Erlangen, Fraunhofer IIS has now 13 locations in 10 cities: Erlangen (headquarters), Nuremberg, Fürth, Dresden, further in Bamberg, Waischenfeld, Coburg, Würzburg, Ilmenau and Deggendorf. The budget of 150 million euros is mainly financed by projects. 24 percent of the budget is subsidized by federal and state funds.

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