

EO-ALERT

Next Generation Satellite Processing Chain for Rapid Civil Alerts

Press Release

January 21st 2021

RAPID ALERTS FROM SATELLITE CAN BE DELIVERED IN SECONDS

End-to-end global delivery time for Earth Observation products is confirmed to be below 1 minute

Ship detection and identification can be performed in seconds

The concept behind **EO-ALERT H2020 project** led by DEIMOS Space has been validated after successful tests performed at Graz University of Technology, in Austria.

The tests were conducted on the global real-time relay service using the Inmarsat and Addvalue Innovation Inter-satellite Data Relay System (IDRS) service, now operational in low Earth orbit ([News](#)). The objective was to prove the suitability of using the IDRS system for one of the EO-ALERT application scenarios: ship detection and classification, based on an EMSA Vessel Detection Service (VDS)-like service. The **end-to-end global delivery time was confirmed to be below 1 minute for a single alert, meaning that ship detection and classification alerts from satellite can be delivered to ground in just seconds after image acquisition.**

Results show that the IDRS system is suitable for EO-ALERT global alert message delivery with a **transmission rate of up to 250 kbit/s** achieved in testing for the transmission of Earth observation products from Optical and SAR observations. The **global delivery time below 1 minute for a single alert** was obtained after adding the time required by the entire on-board processing chain (about 35 seconds for SAR image and ship product generation and about 20 to 40 seconds for optical image and ship product generation) to the IDRS transmission latency.

The **EO-ALERT** project focuses on the definition and development of the next-generation EO data and processing chain, based on a novel flight segment architecture that moves optimised key EO data processing elements from the ground segment to on-board the satellite, with the objective of providing the EO products to the end user with very low latency (enhanced near-real time) for increased throughput. In the frame of the EO-ALERT project, the IDRS service is a very compelling option for delivering the on-board processed products to the End User globally and within seconds.

IDRS, the small and compact communications system developed by Addvalue Innovation, enables the communication at L-band with the Inmarsat global constellation of GEO satellites. This system enables

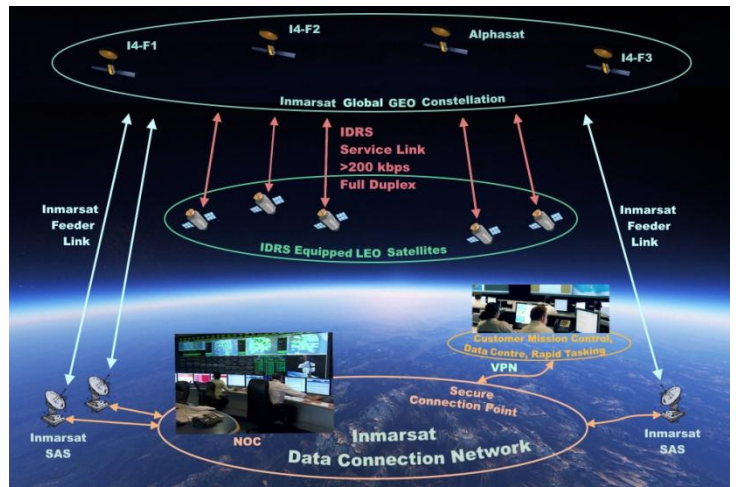


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 776311

applications and missions with real-time tasking and real-time data delivery corresponding with any impromptu events. The IDRS terminal employs either a directional antenna that is assisted by the LEO satellite, or an autonomous switched antenna, and tracks the visible GEO satellite in order to automatically establish a continuous connection, with sustainable data rates of 200 kbit/s.



IDRS i100 Terminal



IDRS System Concept

In order to demonstrate and validate the IDRS system as a global data relay service for alerts in the frame of the EO-ALERT project, a **series of tests has been performed** at Graz University of Technology using a standard Inmarsat Broadband Global Area Network (BGAN) terminal, which emulates the same service as the Addvalue space transceiver. Transfer of representative alerts (EO products) has been tested and the latency and throughput measured.

Deimos Space CEO Ismael Lopez remarked: *“DEIMOS Space and the EO-ALERT consortium will showcase the full EO-ALERT concept, including Addvalue IDRS transceiver hardware and service, as part of the avionics bench testing in 2021. This will provide further confirmation of the EO-ALERT concept and solution as a solid global delivery service for real-time earth observation products, for which DEIMOS is integrating in its commercial small satellite solutions such as SAT4EO+. Including the full IDRS capabilities is a key element of the next-generation EO data and processing chain.”*

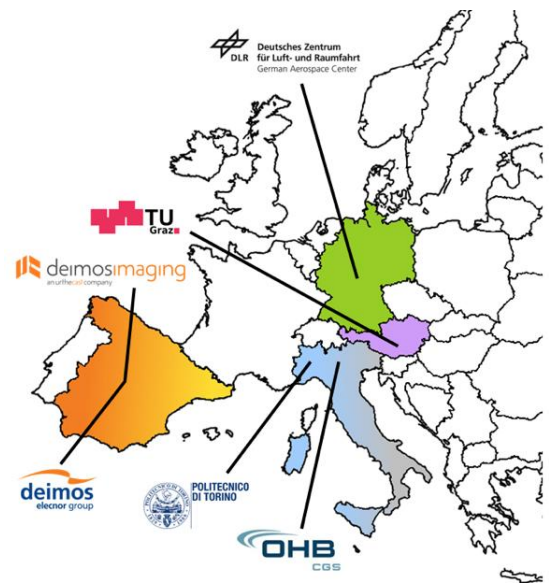
“The tests concluded by Graz University of Technology again highlight our IDRS service as a critical enabler to accomplish sophisticated, advanced EO missions where the requirements of low latency, 24/7 on-demand, and a reliable IP data service cannot be compromised”, said Francis Low, Head of Advanced Development at Addvalue Innovation. *“IDRS is indeed the sui generis data connection solution for the new space industry. We are very pleased with the outcome of these tests and confident that Deimos partners in the EO-ALERT project, DLR and OHB Italia will embrace this ground breaking concept as an integral part of their new satellite missions.”*



This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 776311

About EO-ALERT

The [EO-ALERT](#) project is an H2020 European Union research activity led and coordinated by DEIMOS Space. It started in January 2018 and is ending in 2021. It aims at achieving very high throughput and very low latency (below 5 minutes) in the delivery of Earth observation images and products. The partners of the project are [Deimos Space](#), [DLR](#), [Graz University of Technology](#), [Politecnico di Torino](#), [OHB Italia](#) and [Deimos Imaging](#), with the participation of the Spanish State Meteorological Agency ([AEMET](#)) as a third party. The consortium covers the full R&D cycle, from university to industry, and over the full EO value chain, facilitating the maturation of the innovative concepts, so as to enable their rapid exploitation in upcoming EO missions.



EO-ALERT Consortium

The main objective of EO-ALERT is that of developing, in a fully integrated approach, the technological building blocks required to achieve the primary goal of a next-generation EO data and processing chain, to provide enhanced EO products and services in terms of high availability rate and very low latency (e.g. rapid meteorological and civil security image products and warnings).

For further information, [contact](#) us and follow us: [Twitter](#) | [LinkedIn](#).

About DEIMOS Space

[Elecnor Deimos](#) provides high-technology engineering and information systems, products and services of maximum quality, innovation and added-value to its customers.

In Space the company develops systems engineering, ground segment, mission analysis and design, onboard software solutions and satellite integration, in the fields of Science and Exploration, Satellite Navigation, Earth Observation, Space Situational Awareness, and Launchers.

The company is specialist in turnkey operational systems for aeronautical and maritime applications, both civil and military, including UAV systems and solutions. DEIMOS also provides digital transformation solutions, applications for the optimisation of industrial processes, and products for the transport sector, including location-based services.

For further information, follow us: [Twitter](#) | [LinkedIn](#).

About Graz University of Technology (TU Graz)

[TU Graz](#) is the second largest technical university in Austria and has a long track record in space technology and space experiments.

The Institute of Communication Networks and Satellite Communications has been active in the development and test of high-speed satellite transmission systems, microwave propagation (up to mm



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 776311

waves) and space-qualified hard- and software since 1968 within ESA, EU, national and industry projects. The institute has developed several ground stations for GEO and LEO satellites. It has been responsible for the development and operations of Austria's first satellite TUGSAT-1 /BRITE-Austria, an astronomy mission launched in 2013, as well as the technology nanosatellites OPS-SAT (launched in 2019) and currently PRETTY, developed under ESA contracts.

Within the EO-ALERT consortium the institute is responsible for the design of the communications subsystem and an emulator as part of the EO-ALERT test bench.

About Addvalue Innovation

Addvalue Innovation Pte Ltd, a wholly-owned subsidiary of SGX Mainboard-listed Addvalue Technologies Ltd (A31), is a leading satellite-based communication solutions company. Addvalue provides state-of-the-art communication terminals for use in space, in the air, at sea and on the ground. The company also offers extensive engineering and integration services to its customers. Addvalue's expertise extends far beyond where the world's terrestrial networks end. Whatever the market or application, the company's wide range of satellite-based products and services is sure to offer the right technology to drive enhanced connectivity. Learn more at www.addvaluetech.com.

About Inmarsat

[Inmarsat](http://www.inmarsat.com) is the world leader in global, mobile satellite communications. It owns and operates the world's most diverse global portfolio of mobile telecommunications satellite networks, and holds a multi-layered, global spectrum portfolio, covering L-band, Ka-band and S-band, enabling unparalleled breadth and diversity in the solutions it provides. Inmarsat's long-established global distribution network includes not only the world's leading channel partners but also its own strong direct retail capabilities, enabling end to end customer service assurance.

The company has an unrivalled track record of operating the world's most reliable global mobile satellite telecommunications networks, sustaining business and mission critical safety & operational applications for more than 40 years. It is also a major driving force behind technological innovation in mobile satellite communications, sustaining its leadership through a substantial investment and a powerful network of technology and manufacturing partners.

Inmarsat operates across a diversified portfolio of sectors with the financial resources to fund its business strategy and holds leading positions in the Maritime, Government, Aviation and Enterprise satcoms markets, operating consistently as a trusted, responsive and high-quality partner to its customers across the globe.

For further information, follow us: [Twitter](https://twitter.com/inmarsat) | [LinkedIn](https://www.linkedin.com/company/inmarsat) | [Facebook](https://www.facebook.com/inmarsat) | [YouTube](https://www.youtube.com/channel/UCv0L3t0G1t0G1t0G1t0G1t0) | [Instagram](https://www.instagram.com/inmarsat).



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 776311