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# High-Speed Integrated Satellite Data Systems For Leading EU

Hi-FLY is a research project funded by the European Commission's Horizon 2020 Research and Innovation Programme. It is scheduled to last for 42 months and is implemented by a consortium of industrial and academic partners.

The aim of Hi-FLY is to develop and validate innovative technologies to remarkably improve space on-board data handling and transfer capabilities, primarily for Earth Observation and partly also for Telecom future missions.

## Project Partners

- Airbus Defence and Space GMBH
- Airbus Defence and Space SAS
- Tesat-Spacecom GmbH & Co.KG
- STAR-Dundee Limited
- University of Dundee
- Integrated Systems Development S.A.
- Deutsches Zentrum Luft - und Raumfahrt e.V.
- Kongsberg Spacetec AS
- Erzia Technologies SL
- Universitat Autonoma De Barcelona
- Ethniko Kai Kapodistriako Panepistimio Athinon
- Modus Research and Innovation Limited

The Hi-FLY consortium brings together world-leading experienced experts in all the required fields to deliver the objectives and outputs of the project. Industrial leaders, large organisations and SMEs, are joining forces with influential academics to ensure that the research efforts translate into market -ready and industry-aligned technologies. By delivering breakthrough innovation designed to respond to the needs of future space missions', the Hi-FLY project will ensure that the internationally competitive position of European spacecraft primes and equipment manufacturers is maintained and enhanced in the strategically important area of satellite systems.

## Main Objectives

- Design on-board payload data-processing technology capable of a processing power of well over a Tera Operations Per Second (TeraOPS) and 100s of Giga Floating Point Operations Per Second (GFLOPS) using a network of programmable digital signal processing (DSP) processors and field programmable gate arrays (FPGAs).
- Advance on-board high-speed data storage with a capacity of up to 64 Tbit and a maximum data-rate of up to 50 Gbps, building on the research of the ESA Next Generation Mass Memory Architecture (NGMMA) activity.
- Design adaptive, reconfigurable, multi-Gbps inter-spacecraft data transfer and downlink capabilities using optical and RF techniques which can achieve data-rates of 10 Gbps, substantially increasing the amount of information that can be collected from a spacecraft and opening new opportunities for Earth observation instrumentation and telecommunications spacecraft.
- Advance efficient on-board data compression and other adaptive data reduction techniques to reduce the burden on the downlink and data storage systems, boosting the amount of useful information transferred to ground and increasing the effective information storage capacity of the data storage system.
- Provide a standard interface, SpaceFibre, to the instruments and elements of the payload data chain, which is scalable to sustain data-rates from 1 Gbps to 40 Gbps per link and which is able to support both very high-speed data transfer and equipment control, configuration and monitoring through the same interface, enhancing overall system reliability .
- Design a very high-performance on-board network technology, building on the innovative SpaceFibre standard, which provides quality of service (QoS), autonomous fault detection, isolation and recovery (FDIR), and low latency time-distribution, synchronisation, event signalling, error reporting and network control services.
- Integrate and demonstrate the end to end data chain supporting an input data-rate from instruments of 50 Gbps and an output data-rate to the downlink of 10 Gbps.

## Get In Touch

Modus Research and Innovation Limited | Tayside Software Centre | Gemini Crescent | Dundee, DD2 1TY | **www.hi-fly.eu**

**Project Office:** hi-fly@modus.ltd