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INTER-SATELLITE LINK MULTI-SERVICE SATELLITE TRANSCEIVER (MUST)

**Abstract**

In the past years market analysis was showing a trend for the space systems concept and developments moving from the use of large GEO satellites to the exploitation of smaller satellites in Low Earth Orbit (LEO), which is undergoing an acceleration process with the deployment of constellations of LEO satellites. The emerging market for LEO satellite constellations addresses Telecom broadband and IoT applications, where Airbus is marketing worldwide its solutions based on OneWeb class satellites, as well as Earth Observation applications using minisat class.

In this context, Airbus Italia, part of the Space Product division of the Space Systems business line of Airbus Defence and Space, is presenting the Inter-Satellite Link (ISL) MUlti-service Satellite Transceiver (MUST) transceiver unit targeting small satellites which require an Inter-Satellite Link (ISL) capability but cannot embark more weighty and expensive solutions like the laser-link terminals.

Modularity, flexibility, configurability and on-flight re-programmability are the strengths of this ISL transceiver which allow a wide range of solutions to cover the customer needs.

The multi-band and multi-channel capabilities of the transceiver as well as its flexibility can be exploited to implement different services:

- Ka-band ISL service with GEO overlays including EDRS for quasi-realtime tasking and telemetry;
- Long distance Ka-band ISL between two LEO spacecraft's for constellation management via telecommands and telemetries distribution and payload data relay;

- Short distance S-band ISL between two LEO spacecraft's for formation flying and bi-static system synchronization.

This product of Airbus Italia is conceived to become a LEO systems commodity, enabling TTC via relay (GEO or other LEO) and medium rate payload data relay with the following advantages:

- High system reactivity enabling improvement of spacecraft and payload management;
- Complementary payload data downloading for high availability;
- LEO systems spacecraft synchronization for precise and reliable formation flying;
- Cheaper ground segment allowing an easier constellation management.

In this paper the application scenario, product specifications, unit production and performance will be presented. The transceiver modularity and wide flexibility will be introduced, explaining how these characteristics will allow the transceiver to be easily adapted to the market variations and specific customer needs.