

**Next generation Platform Input/Output Unit Roadmap and
Standard Building Blocks**

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Astrium recent Earth Observation & Science avionics architectures feature a standardized OBC providing processing capability, data bus and serial link interfaces and one or several stand-alone input/output units, e.g. called Electrical Interface Unit (EIU) on Gaia or Remote Interface Unit (RIU) on Bepi-Colombo, Sentinel-2, EarthCare, Ingenio.

As a consequence, OBC functions may stay mostly constant from one programme to the other while I/O units provide the necessary interface adaptation to platform hardware (mostly discrete signals).

To go further with standardisation, increase development efficiency and facilitate reuse, standard interfaces and functions can be defined. This is the case of the command and control protocol to be used between OBC and I/O unit. Also, today, board level modularity allows equipment suppliers to derive variants of the same generic concept for several units within the same spacecraft (Bepi-Colombo) or between programmes (Sentinel-2 and EarthCare).

Integrated technology (analog/digital ASIC) is emerging and will lead in future projects to more compact and flexible designs (e.g. programmable signal profiles). This technology is available in Europe and affordable for space projects. Industry could develop together with ESA a set of standard ASIC complying with standard interface definitions (protocols, electrical interfaces) which would be used by European suppliers to build their equipment.

The proposed presentation will show the Astrium I/O unit architecture roadmap for the next generation of Earth Observation & Science avionics and will address:

- Lessons learnt from recent programmes
- Review of I/O unit use cases : stand-alone I/O unit, I/O unit extensions for decentralised acquisitions and commands, local OBC discrete I/Os, Instrument Control Unit
- Requirement synthesis

Possible implementation solutions (technology, suppliers) and resulting building blocks