



Grant Agreement n°101135215



Space USB Project Presentation ESA Clean Space Days

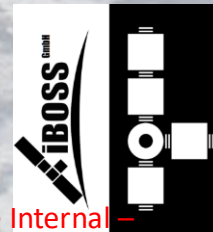
Date : October 2024

Place : European Space Agency – ESTEC (NL)

Côme BERGER – Satellite System Engineer – Thales Alenia Space (Cannes, FR)



Thales Alenia Space Internal –
Limited Distribution Thales Alenia Space



sener

In Extenso
Innovation Croissance



Grant Agreement n°101135215

Space USB Presentation – ESA CSD

- Agenda :
 - Introduction
 - ‘Space USB’ Project Presentation
 - Achievements & Upcoming challenges
 - Conclusion
 - Q&As



SPACE USB



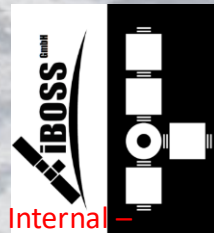
Grant Agreement n°101135215



Introduction



Thales Alenia Space Internal –
Limited Distribution Thales Alenia Space

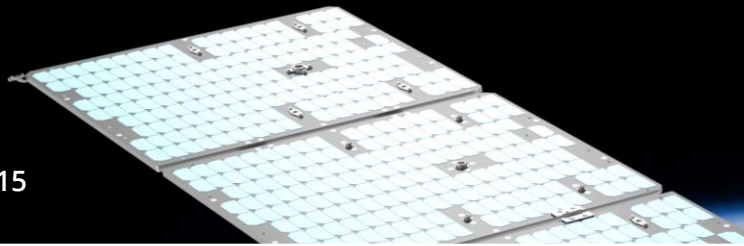


sener

In Extenso
Innovation Croissance



Grant Agreement n°101135215

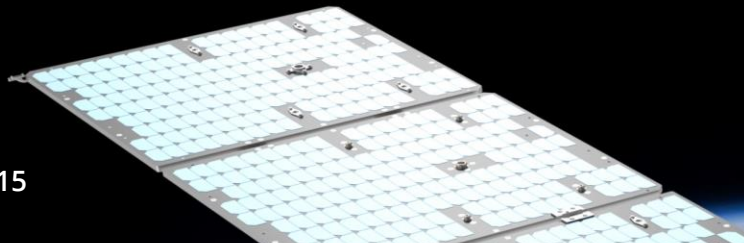


INTRODUCTION

- What is a Standard Interconnect (S.I) ?
 - Linked to On-Orbit Servicing world
 - Product able to :
 - Mechanically connect a space system (satellite/payload/ Orbital Replacement Unit) to another
 - Transfer
 - Electrical power
 - Data
 - Thermal power
 - Fluid



SPACE USB



- European Standard Interconnect (S.I) Products – Suppliers

Project Members

Manufacturer	iBOSS (GE)	SENER (SP)	Space Applications (BE)
Product (SI)	iSSI	SIROM	HotDock
Claimed TRL	TRL 7	TRL 4	TRL 4
Product views			

→ Each Supplier has its own product and features : how to harmonize future space ecosystems ?



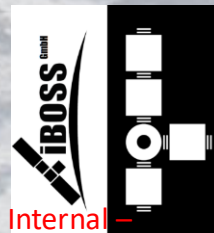
Grant Agreement n°101135215



Project Presentation



Thales Alenia Space Internal –
Limited Distribution Thales Alenia Space

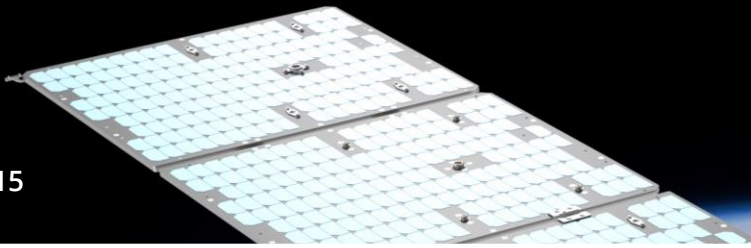


sener

In Extenso
Innovation Croissance



Grant Agreement n°101135215



PROJECT PRESENTATION

- Why Space USB ?



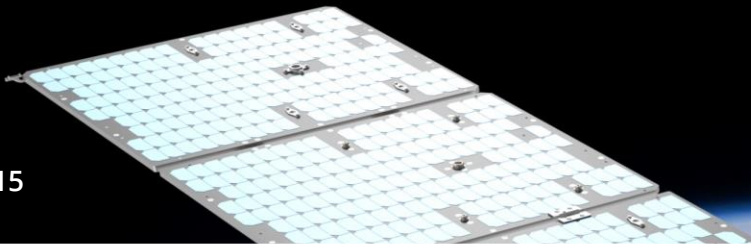
- Space USB name is a reference to the IT World with the USB serial connection :
 - Open standard
 - Widely used to connect an IT system to another
 - Large variety of functions (eg. Transfer power, video, ...)
- Project funded by European Commission
 - **Initial Idea : to create an USB-like open standard for space systems connections**
 - On-Orbit Servicing applications
 - Thales Alenia Space acting as Space USB Project Coordinator



SPACE USB



Grant Agreement n°101135215



PROJECT PRESENTATION



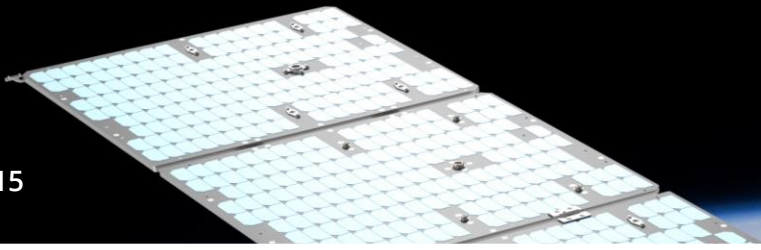
Thales Alenia Space Internal –
Limited Distribution Thales Alenia Space



SPACE USB



Grant Agreement n°101135215



PROJECT PRESENTATION

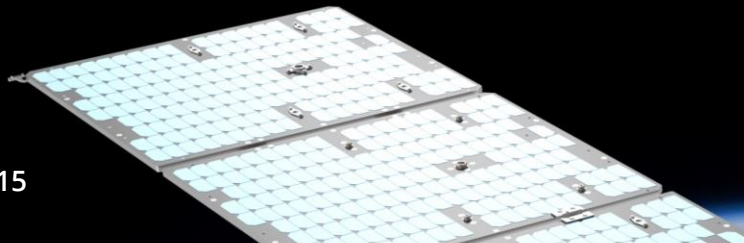
- What are the goals of Space USB ?



SPACE USB



Grant Agreement n°101135215



PROJECT PRESENTATION

Objective 1: The definition of a complete and self-consistent technical specification for the development of the future space standard interconnects (SIs)

- Technical Specification to be released by Q3 2024

→ **To release an open standard acting as a norm for future standard interconnects**

Potential Link with
ESA De-60bit Standard
for SatCom



Objective 2: The verification of this new standard

→ **Compliance Status of SENER, iBOSS and SpaceApps to the new Technical Specification**

- Upcoming work in 2025

Objective 3: Technology maturation through industrial collaboration

- Demonstration of interoperability between existing products of manufacturers

→ **Design, Assembly and Testing of a Prototype** by the 3 European manufacturers

- Upcoming work in 2025

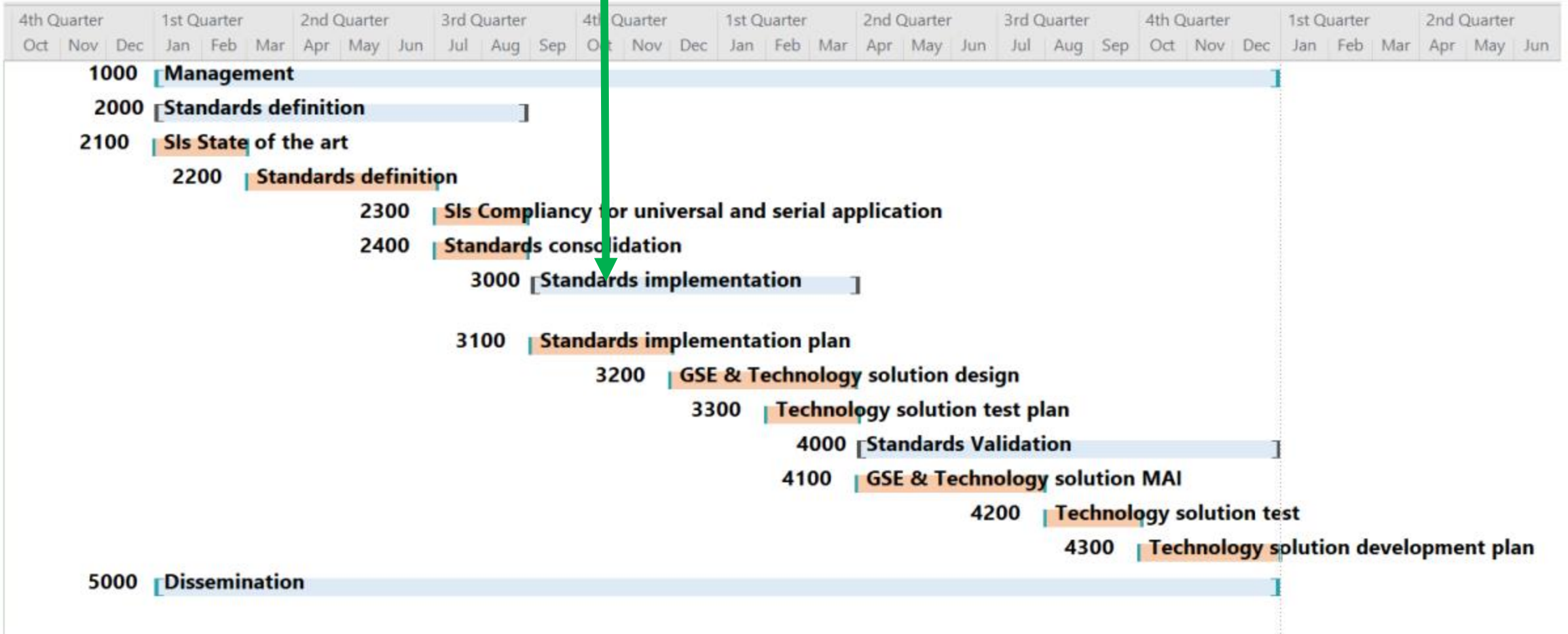


SPACE USB



Grant Agreement n°101135215

PROJECT PRESENTATION



Thales Alenia Space Internal –
Limited Distribution Thales Alenia Space



SPACE USB



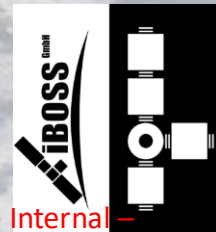
Grant Agreement n°101135215



Achievements & Upcoming challenges



Thales Alenia Space Internal
Limited Distribution Thales Alenia Space

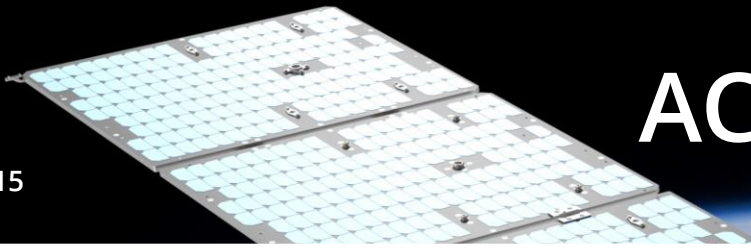


sener

In Extenso
Innovation Croissance



Grant Agreement n°101135215



ACHIEVEMENTS & CHALLENGES

- Achieved so far by Space USB Consortium :
 - **State of the Art on existing Standard Interconnects**
 - Collecting satellite prime user needs for future Standard Interconnects
 - **Draft Technical Specification for Space USB released internally**
 - Technical Specification to be delivered to European Commission officially by Q3 2024



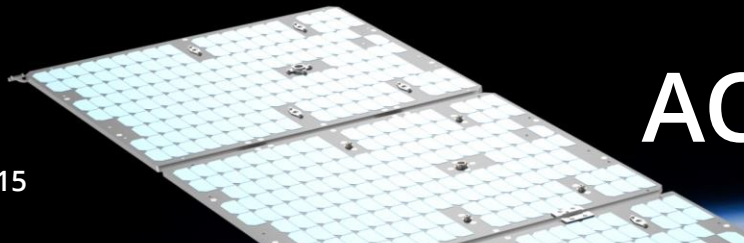
SPACE USB



ACHIEVEMENTS & CHALLENGES

- Main Challenges faced by the project :
 - CHALLENGE#1 :
 - **How to make inter-operable existing Standard Interconnects ?**
 - Different mechanical coupling devices (bajonette vs locking ball vs latches)
 - Different electrical connectors (pogo pins versus D-Sub, ...)
 - How to harmonize without killing European innovation (more than 3 suppliers with different designs) ?
 - OPTION A : Design a new passive Standard Interconnect compatible with 3 existing designs
 - Complex
 - Heavy
 - OPTION B : Design adaptors (adaptor iBOSS → SENER, iBOSS → SpaceApps, etc...)





ACHIEVEMENTS & CHALLENGES

- Main Challenges faced by the project :
 - CHALLENGE#2 :
 - **How to design a suitable prototype of such a universal Standard Interconnect ?**
 - Work not started yet (will follow Tech Spec Release)
 - Will highly depend on CHALLENGE#1 (previous slide) outcomes





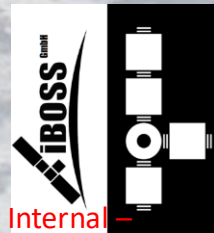
Grant Agreement n°101135215



Conclusion

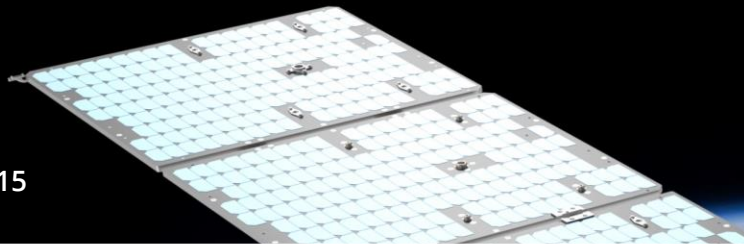


Thales Alenia Space Internal –
Limited Distribution Thales Alenia Space



sener

In Extenso
Innovation Croissance



- Conclusion :

- Space USB : Project EU-funded to standardize Standard Interconnects via
 - A Technical Specification 'Standard'
 - Compliance Status of 3 EU Standard Interconnect Suppliers to this Spec
 - A technology Demonstrator (TRL 3) prototype of universal Standard Interconnect
- Challenges
 - **How to make inter-operable existing Standard Interconnects ?**
 - How to design a suitable prototype of such a universal Standard Interconnect ?





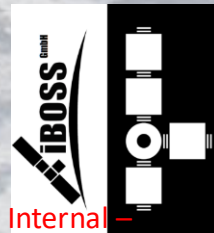
Grant Agreement n°101135215



Q&As



Thales Alenia Space Internal –
Limited Distribution Thales Alenia Space



sener

In Extenso
Innovation Croissance