

SPACE SYSTEMS SYMPOSIUM (D1)
Space Systems Architectures (2)

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IBOSS MODULAR PLUG&PLAY – STANDARDIZED BUILDING BLOCK SOLUTIONS FOR
FUTURE SPACE SYSTEMS ENHANCING CAPABILITIES AND FLEXIBILITY, DESIGN,
ARCHITECTURE AND OPERATIONS

Abstract

Modular concepts and standardization of space infrastructure elements have been investigated for decades, while building block systems and standard interfaces have not become reality or routine in space system design yet.

iBOSS goes back to a collaborative research project funded by the German Aerospace Center DLR Space Administration since 2010. While the project name iBOSS - “Intelligent Building Blocks for On-Orbit Satellite Servicing and Assembly” - anticipates solutions for OOS and OOA, the technologies developed provide solutions and enabling features of much broader scope and thereby take mission architecture and space system design to a next level in multiple ways. iBOSS core technology ground qualification in 2017 will be followed by in-orbit demonstration (IOD) in 2019 paving the way for in-space utilization in multiple projects and systems from 2020 on. The iBOSS GmbH is the catalyst driving the introduction of iBOSS standards and supporting the initiation of multiple partnerships with industry, academia and agencies in a new and unique open-source-type approach.

The paper addresses relevant needs met by modularity and standards, hence plug&play approaches followed by a brief description of selected key iBOSS products. However, the paper’s focus is on their application and potential for future space systems both orbital and planetary, i.e. assembly, coupling and servicing or reconfiguration options, hosted payload and facilitated experimental environments. Moreover, schemes for iBOSS utilization via new business models and international partnerships as well as a long-term outlook are presented.

Backgrounds of the findings presented are combined experiences made by the authors over decades of involvement in space systems engineering and projects, robotics and simulation, commercialization and new approaches to modular concepts. Partnerships with industry and academia around the world are envisaged for the years ahead