

# SPI Protocol Implementation for Space

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This presentation describes the work performed by Cobham Gaisler and AAC Microtec for the European Space Agency to prototype space protocol(s) for SPI. The work is funded by the European Space Agency under contract 4000114112/15/NL/LF.

This activity has proposed and prototyped SPI protocol(s) and physical layers for space applications based on the intermediate results of TEC-EDD activities (Modular RTU – GSTP, Standardization of Digital interfaces – TRP) and also acquiring inputs from companies and entities being module/unit designers or space component manufacturers.

The physical layer, data link layer and network layer for the SPI communication are defined in the proposed draft standard. Three different alternatives for the physical layer (PCB, Backplane and Cable using LVDS) are defined and prototyped. Different communication protocols are defined to provide a generic solution for existing devices and a separate protocol for high or medium traffic load with detailed data and network layer definition. The data and network layer provides data word formats, message formats defining commands and responses, data integrity and redundancy solutions.

In the frame of the activity SPI VHDL IP cores and simulation models are developed for the SPI protocol(s) and physical layers. A demonstrator (Test bed) for the verification of the protocol(s) are manufactured. During the presentation the test results from the test bed and simulation models will be presented.