"Protocol Validation System (PVS) for On-Board Communications: Extensions and Evolutions to EGSE Requirements"

ESTEC contract numbers: 4000105444/12/NL/CBI, 4000111156/14/NL/CBI, 4000112726/14/NL/CBI

iSAFT PVS is an integrated powerful HW/SW environment for the simulation, validation & monitoring of satellite/spacecraft on-board data networks supporting simultaneously a wide range of protocols (RMAP, PTP, CCSDS Space Packet, TM/TC, CANopen, etc.) and network interfaces (SpaceWire, ECSS MIL-STD-1553, ECSS CAN).

It is based on over 20 years of experience in the area of protocol validation in the telecommunications and aeronautical sectors, and it has been fully re-engineered in cooperation with ESA & space Primes, to comply with space on-board industrial validation requirements (ECSS, EGSE, AIT, AIV, etc.). In fact since 2009, and in various ESA contracts PVS has been reengineered to support validation of SpaceWire, MIL-STD-1553 and CAN/CANOpen on-board networks).

iSAFT PVS is highly modular, thus easily expandable to support new network interfaces & protocols and it is based on the iSAFT PVS powerful graphical tool chain (Protocol Analyser / Recorder, TestRunner, Device Simulator, Traffic Generator, etc.).

Its main features include:

- Rapid prototyping/evaluation of new on-board communication protocols
- Device/instrument simulation
- Functional/conformance testing
- Traffic generation
- Protocol analysis/recording

The presentation will present the latest PVS developments during the last 2 years. Specifically, the presentation will highlight the recent functionality achieved such as CAN/CANOpen simulation and recording, MIL-STD-1553 BC/RT simulation, SpW codec with error injection capability. Additionally an important part of the presentation deals with the PVS extensions according to realistic EGSE requirements (support of EDEN, C&C CCSDS protocols, integration of TM/TC data handling, etc.) and the extensive PVS validation in realistic mission testbenches (such as Solar Orbiter, GAIA, MTG)