



SIMON

A C T U A T E S A F E L Y

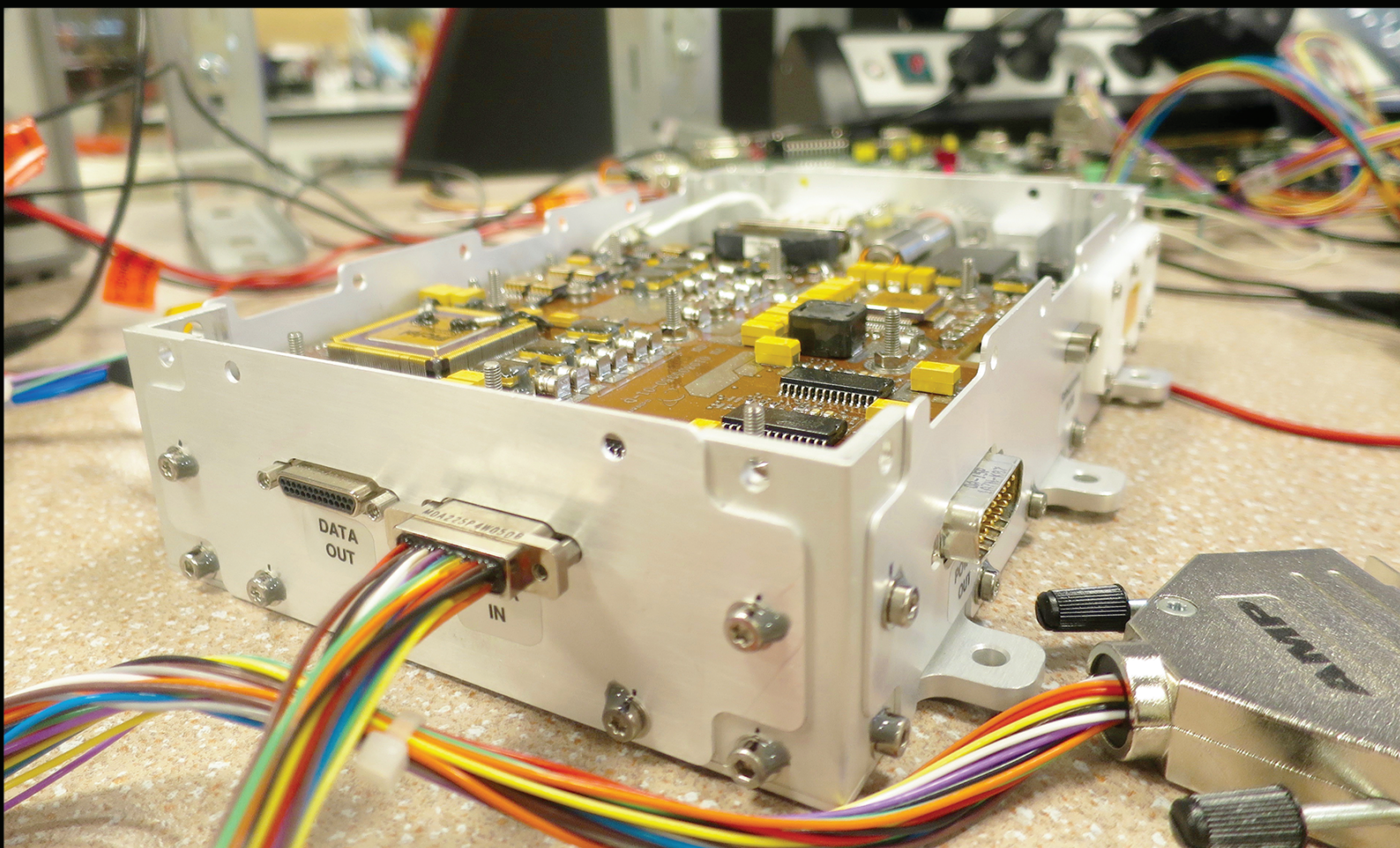
SimOn is an electro-explosive system (EES) used for the remote safe ignition of pyrotechnical chains. The system is particularly indicated for the ignition of solid rocket motors.

SimOn features:

- A safe and arm device (SAD), a mechanism that implements the physical separation between the pyrotechnical component and the pyro-duct.
- Electronic boards that handle the user-interface and actuate the requested manoeuvres.
- An EED, the pyrotechnical component that generates the SRM ignition.

STANDARDS

- MIL-STD-1576 and ECSS-E-ST-33-11C for the design of electro-explosive system and pyrotechnical device.
- ECSS-E-ST-33-01C and ECSS-E-ST-20C for mechanisms and electronic board design.



FEATURES

- Remove-Before-Flight and Insert-Before-Flight devices to provide safety during ground handling.
- Impossibility to arm the device with only one command.
- Physical separation between the circuit that triggers EED and the rest of the electronics.
- Inhibit monitoring.
- Three electronic inhibits to prevent inadvertent EED ignition.
- Two mechanical inhibits to prevent SAD arming.
- Connection of the mechanical arm status to the electronic arm status through one inhibit to avoid EED ignition when the pyrotechnical chain is not aligned.
- Space-grade field-programmable gate array (FPGA) on the electronic board.

POWER AND DATA INTERFACES

- 12V or 28V DC.
- Differential SPI.
- Data and power connectors are separated.
- Safe and Arming plug to provide safety during handling.

MECHANICAL

- Dimensions: 166x220x49 mm.
- Mass: 1.4 kg.
- Interface: 6 x M4 screws, accessible from top and bottom.
- Pyrotechnical chain with a M5 interface.

ENVIRONMENTAL

- Temperature range: -35°C to +60°C.
- Radiation:
 - TID (excluding shielding): 40 krad (Si).
 - Compliant with 10 years LEO.
 - SEU tolerant, latch-up immune.

HERITAGE

2013: ALICE 2 MISSION – Design, production and qualification of EES prototype, with focus on Safe and Arm Device design.

Features:

- Safe and Arm Device designed according to MIL-STD-1576.
- Prototype of electronic for actuation.

2015: D-SAT MISSION – Design of a highly scalable EES for the CubeSat market. The device was qualified and validated in-orbit in 2017.

Features:

- Safe and Arm Device and electronic improved for integration CubeSat standard.

- Designed according to MIL-STD-1576.
- Design of an Electro-Explosive Device with reduced dimension for the mission.

2016: TeSeR PROJECT – Design of an EES focused on space-grade electronics.

Features:

- Safe and Arm Device and electronic designed according to ECSS-E-ST-20C and ECSS-E-ST-33-01.
- Design according to MIL-STD-1576 and ECSS-E-ST-33-11C.
- Highly modular design.
- Possibility to insert the EES in a differential SPI branch for a maximum of 6 EESs.

2016: FENIX – Design of a micro EES for a solid rocket motor designed for CubeSat application.

Features:

- The dimensions are reduced to minimum.
- Design following MIL-STD-1576 standard.



D O R B I T . S P A C E

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