Ingegneria dei sistemi elettrici
Electric systems

DII research group
Space Measurement and Instrumentation

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The project has been carried out in collaboration with INAF- OaCapodimonte, INAF- OaArcetri, Latmos, Oxford University, INTA, FMI, Temis SrL, ABSL, Aviotec, Unavia

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Main research topics:
- Metrology and measurement
- Sensors and instrumentation
- Instrumentation for planetary exploration
- Space technologies
- Design of Experiments

The DREAMS experiment on the ExoMars 2016 mission for the study of Mars environment during dust storm season

DREAMS is a completely autonomous sensor suite constituted by: power unit (a rechargeable battery) , Central Electronic Unit (CEU) comprising all electronic boards for sensor data acquisition and communication with EDM, the Metmast and uAres masts which host most of the external sensors. Since DREAMS comprises both analog and digital sensors, proximity electronic units are provided for handling digital units. A dedicated harness guarantees the connection of DREAMS hardware in the internal Schiaparelli bay with the external sensing units and the EDM control unit. DREAMS Electronics through its application SW manage the acquisition, pre-elaboration compression and storage of the following sensors: MarsTEM (thermometer), DREAMS-P (pressure sensors), DREAMSH (humidity sensor), MetWind (2-D wind sensor), MicroARES (electric field sensor), SIS (Solar Irradiance Sensor) with contributions coming from all over Europe: Italy (system, CEU, Battery and MarsTEM), Finland (DREAMS-P&H), UK (MetWind), France (MicroARES), and Spain (SIS). Starting from the scientific objectives, the CISAS team derived the scientific requirement end the requirement specifications, for all the engineering aspect: thermal, mechanical, electrical, SW design modeling and testing; electronics functional design and testing while the electronics boards manufacturing has been subcontracted to industry. Reliability is the mandatory key word, while measurement and metrology is the one assuring all the performance, experimentally verified on ground in facilities developed on purpose, reproducing the harsh Martian environment. All the DREAMS suite has been tested and qualified by the research team.