



UNISEC Germany

POC: Prof. Klaus Schilling
presented by Alexander Kramer

Members:

- University Siegen
- TU Dresden
- University Würzburg
- In contact with TU Munich, TU Berlin, TU Braunschweig, FH Aachen, Uni Stuttgart,...

Goals:

- Promotion of joint educational space programs
 - Workshop in order to exchange experiences
 - Joint satellite projects
-



Satellite Technology

Vollantrag

Innovativer Studiengang im Elitenetzwerk Bayern zu Raumfahrttechnologien
und Anwendungen bei Erdbeobachtung und Telekommunikation

Koordiniert durch



Mit den Instituten



Unterstützt von den Partnern



UNISEC global
very helpful as
partner to
represent
international
dimension



Würzburg

The city is located near the center of Germany and offers a wide range of recreation and leisure activities together with theaters, open-air concerts, and wine festivals. Located at the shores of the river Main, vineyards, castles, medieval cities and baroque residence palace are characteristic for the region. The bishop's residence palace is one of Europe's most renowned baroque castles and it is recognized by UNESCO as a world cultural heritage site. Würzburg offers a broad range of accommodations facilities at all costs.



Julius-Maximilians-University Würzburg (JMUW)

The university was first founded in 1402, enrolls today more than 28000 students in 10 faculties and hosts well known research institutions. 14 Nobel Prize winners worked there, most notable among them being Wilhelm Conrad Röntgen, the discoverer of the X-rays.



Residence Palace

The bishop's residence palace is one of Europe's most renowned baroque castles and it is recognized by UNESCO as a world cultural heritage site. The spectacular interiors include the grand staircase, the chapel, the grand salon and the wine cellar. The building was dubbed the "nicest parsonage in Europe" by Napoleon. It was heavily damaged in World War II, and restoration has been in progress since 1945. The Garden uses the fortification's differences in height to create a very special landscape. Near the residence itself, the garden is designed in a very formal, baroque style. Farther away, the style changes to an English garden with small forests and meadows.



Photo Courtesy: Congress-Tourismus-Wirtschaft Würzburg, M. Westendorf, Informatik VII der Universität Würzburg, Universität Würzburg and Staatliches Bauamt Würzburg.



12th Pico and Nano Satellite Workshop

Technology for Small Satellite Research

September 12-13, 2019
Würzburg, Germany



Co-Sponsors

International Academy
of Astronautics



bavAIRia e.V.



UNISEC-Europe



www7.informatik.uni-wuerzburg.de/pina2019



UNISEC Europe

Objectives

- joint proposals for space outreach activities to be funded by European Union, ESA
- contributions to CanSat educational programs
- joint CubeSat conferences and exchange of experiences
- organization of small satellite ground station networks to support the CubeSat community
- standardization of electrical and software interfaces

Meetings typically at conferences,
Such as 2019 at PiNa, IAC

Members

- UNISEC Germany
- UNISEC Lithuania
- UNISEC Samara
- UNISEC Turkey
- UNISEC Italy
- Future candidates
 - UNISEC Bukgaria
 - UNISEC Slovenia
 - Université Paul Sabatier Toulouse
 - Aalto University
 - ...



<http://unisec-europe.eu>

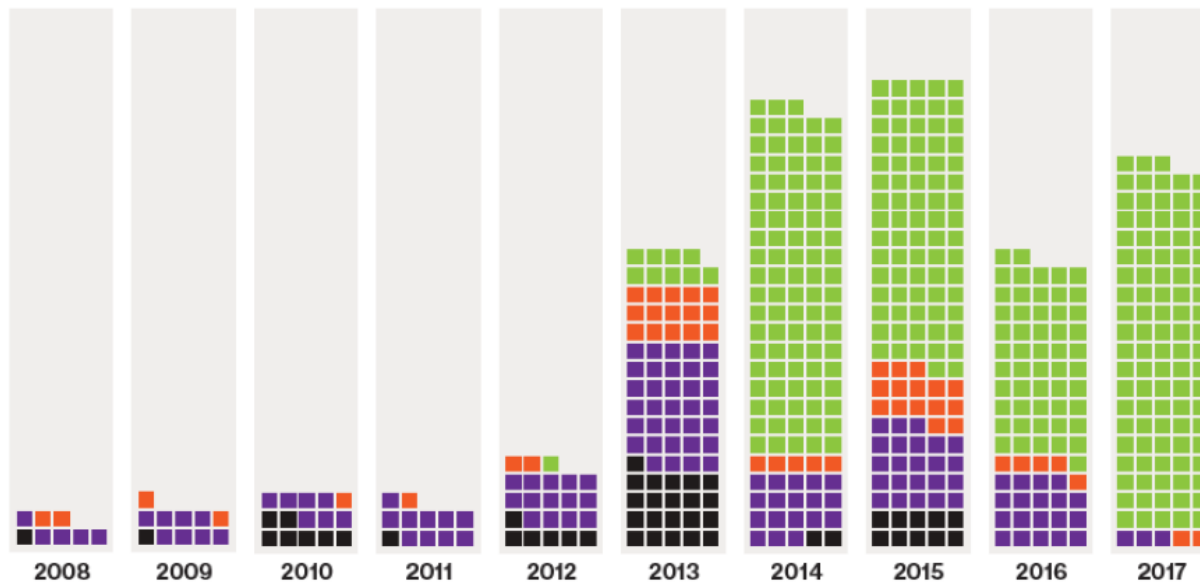


Changing markets for Small Satellites: From Academia to Commerce:

A Big Bet on Small Satellites

If all goes as planned, 2017 will set a new record for commercial launches of tiny spacecraft called CubeSats, each only a liter in volume and weighing less than two kilograms. The diminutive satellites have been used for over a decade in academic and government missions, but now investors and entrepreneurs are betting on new markets in imaging and telecommunications.

■ Military ■ University ■ Government ■ Commercial



since 2014 is the majority of small satellites is commercial



Technology Quarterly:
Q2 2014

MIT TECHNOLOGY REVIEW
VOL. 120 | NO. 3

2017

Nanosatellites

Nanosats are go!

Small satellites: Taking advantage of smartphones and other consumer technologies, tiny satellites are changing the space business

SpaceMaster

Joint European Master in Space Science and Technology



SpaceMaster is supported by scholarships within the "ERASMUS MUNDUS"-Program of the EU for European elite-curricula. It is offered at University Würzburg in cooperation between Computer Science and Physics/Astronomy, and by the partner universities

- Luleå University of Technology, Sweden
- Cranfield University, United Kingdom
- Czech Technical University, Czech Republic
- Aalto University, Finland
- Université Paul Sabatier Toulouse III, France
-

Running since 10 years;
Support by EU has been extended

www.spacemaster.eu

spacemaster.uni-wuerzburg.de

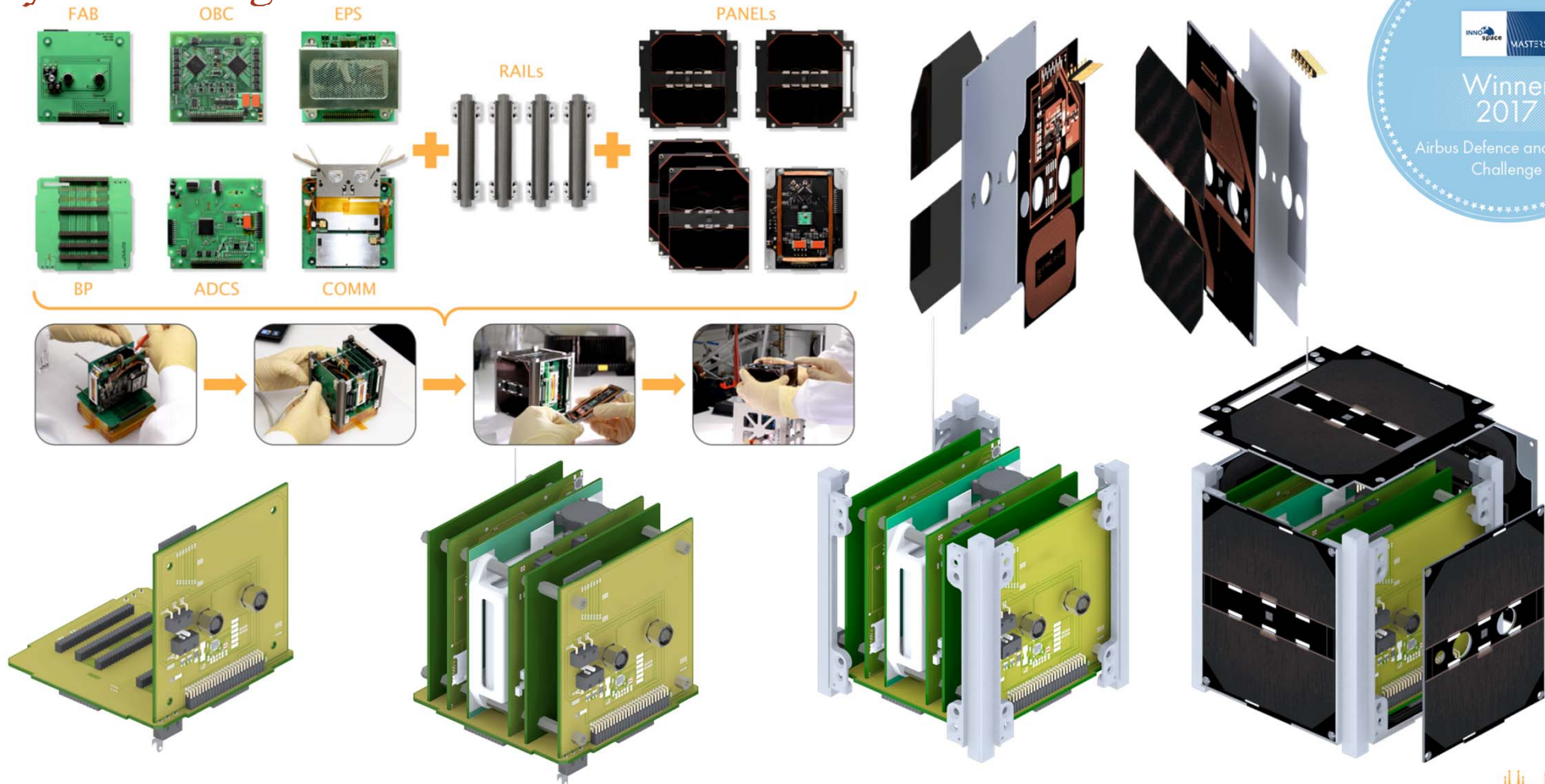


Education: SpaceMaster



Technology Innovations: Standards

Standardization of electrical IF: no Harness, Modular and Flexible Satellite System Design



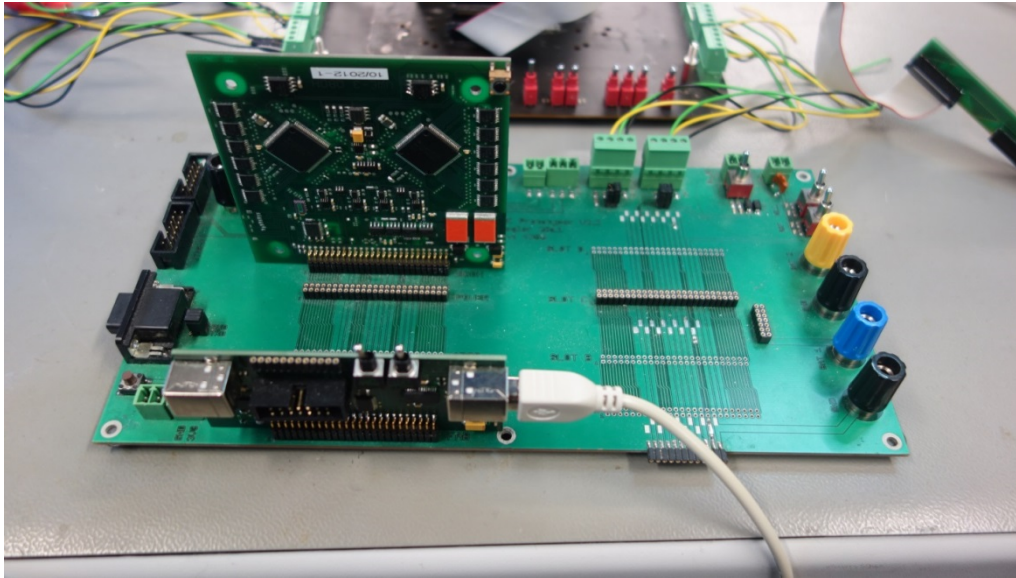
Electrical IF Standards supported by UNISEC Europe



<http://unisec-europe.eu/standards/bus>



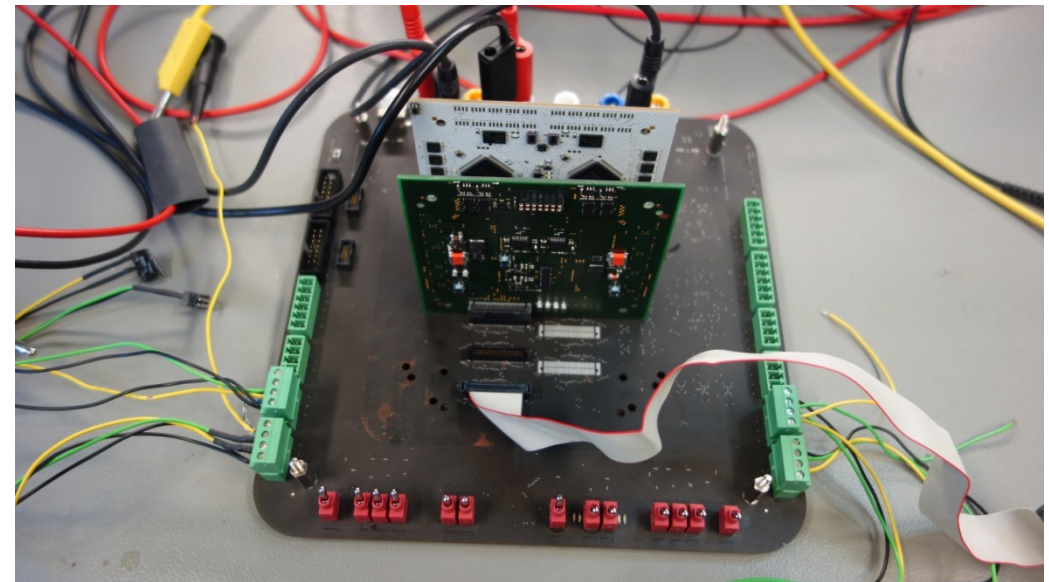
Development Boards for UNISEC Europe Electrical Interface Standard



This standard is realized for two umbilical types. Related development boards support implementation as well as EGSE functionalities.

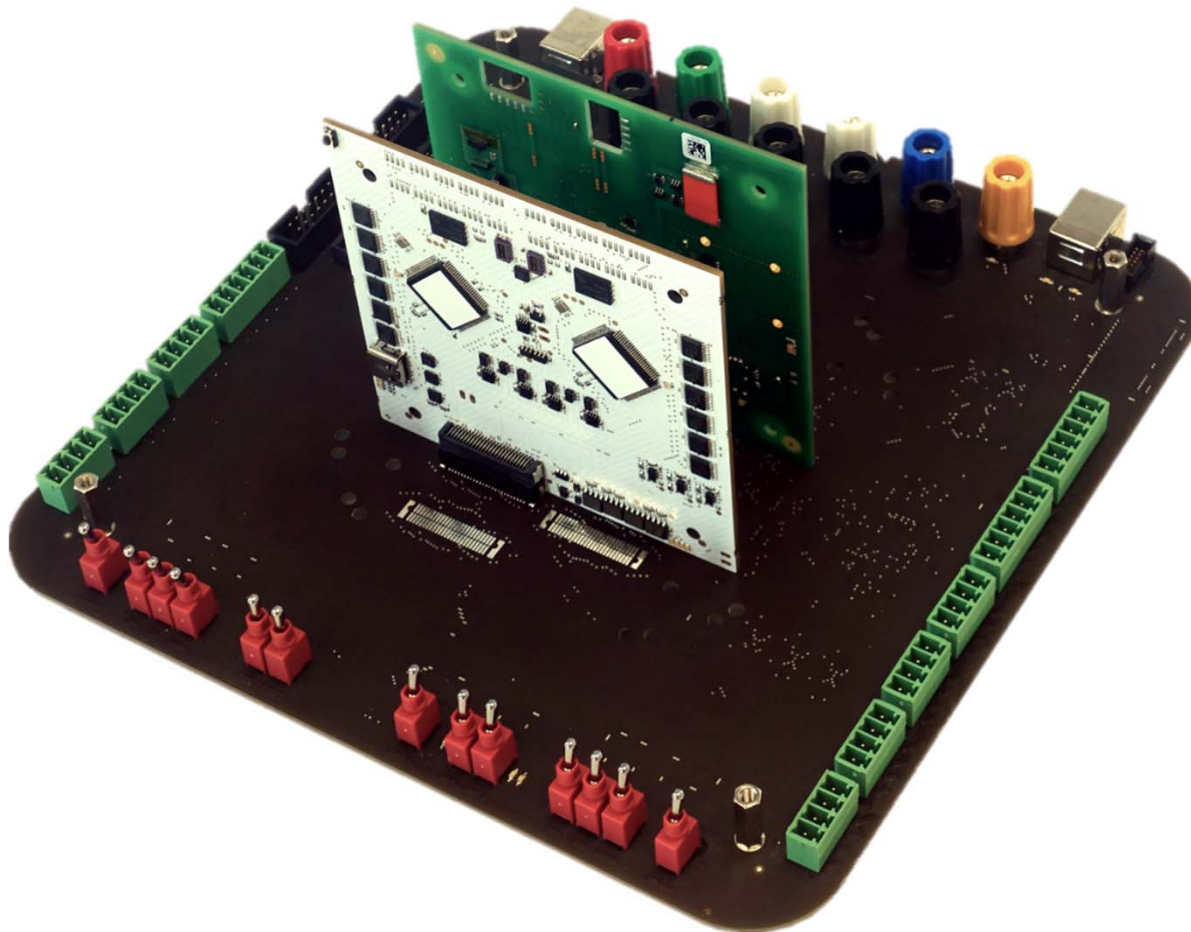
Beyond Europe this electrical interface standard is used also in

- Japan BIRDS-1, BIRDS-2
- China
- Airbus developed OBDH
- OHB evaluates it



Development Boards for UNISEC Europe Electrical Interface Standard

Related development boards support development implementation phase as well as EGSE functionalities after launch.

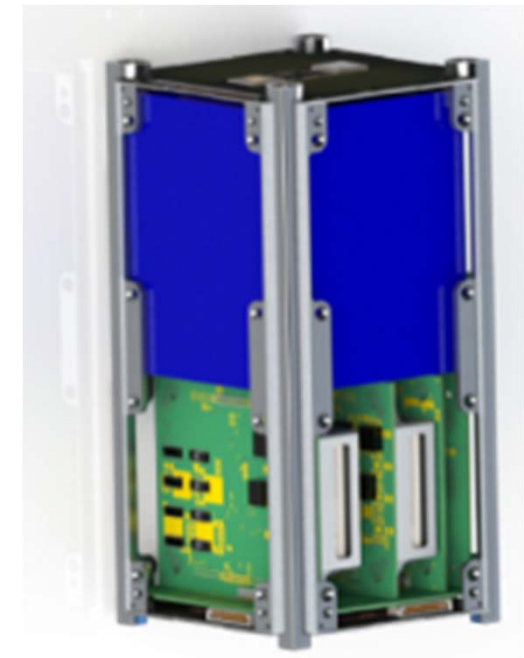
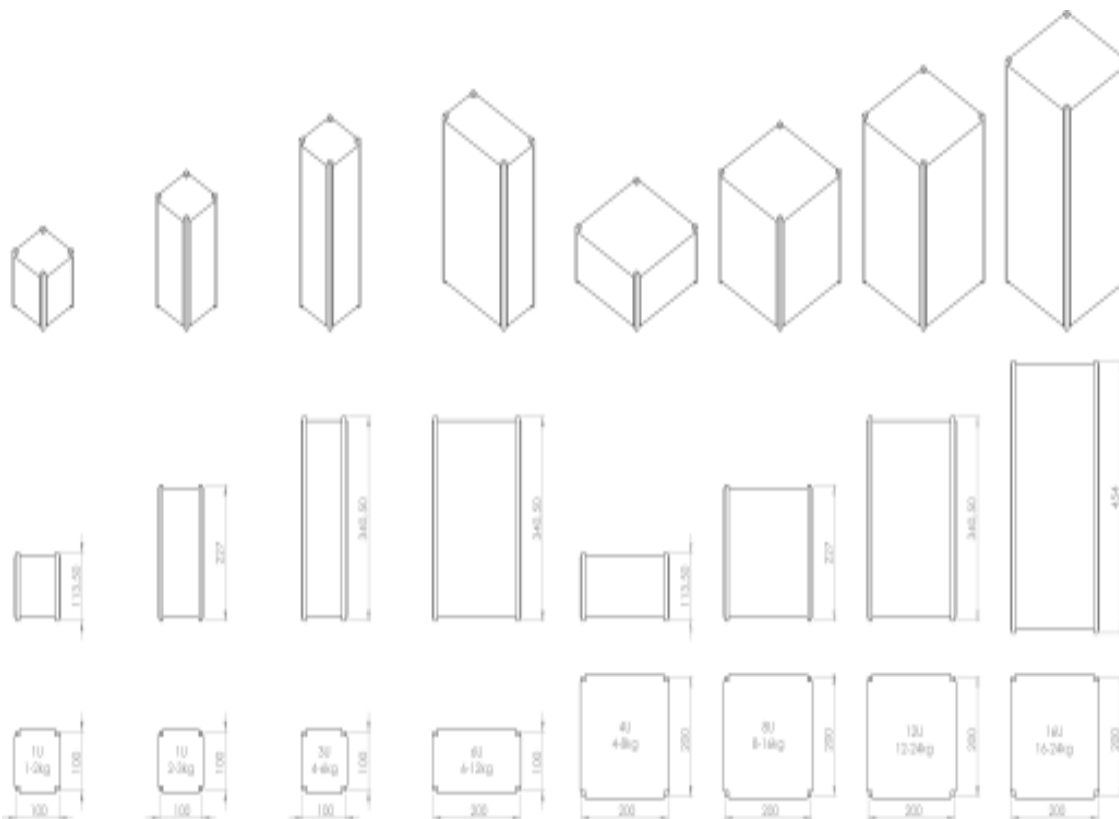


Helpful features:

- provides efficient interfaces to computers during development and simulation tests
- supports flexible, modular satellite architecture
- provides fast and easy access for comparisons between different variants of subsystems
- easy integration: realizes UNISEC Europe electrical interface standard

Our Products

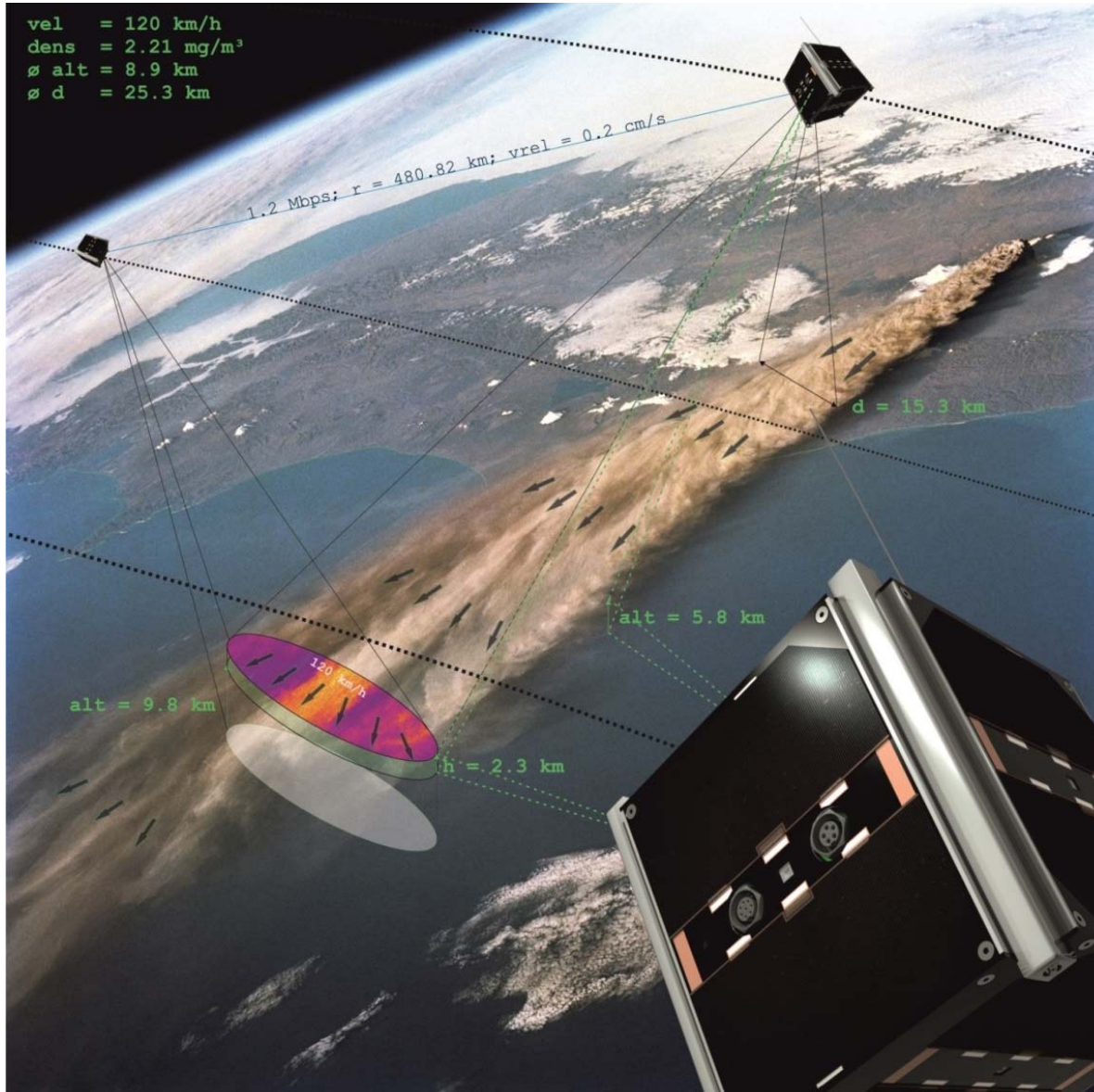
ZfT and S⁴ GmbH offer a broad spectrum of high-performance CubSat products and reliable, low-power miniature Subsystems (OBDH, AOCS, backplane,...) tailored to customer needs to integrate their specific payloads.



Our ambition:
High quality space products
at smallest size possible



Projects coordinated by ZfT: Earth Observation



TOM – Telematics earth Observation Mission:

Photogrammetric Ash Cloud
Observation by a Formation of
three Small Satellites

TIM - Telematics International Mission

12 pico-satellites forming a
sensor network from the partner
regions Bavaria, Georgia, Upper
Austria, Quebec, São Paulo,
Shandong, and Capetown.





Offers for cooperations

- International missions emphasizing distributed networked small satellites for applications in Earth observation and telecommunications
- Support in small satellite design
- International cooperation for networked ground stations
- Intensive classes on small spacecraft design (Tunisia, Russia, USA, Turkey, Brasil, China, ...)
- Participation of students in the „SpaceMaster“ program (<http://www.spacemaster.uni-wuerzburg.de/>)
- Information exchange at Pico- and Nano-Satellite conference (alternating in Berlin and in Würzburg, already 12 conferences, ~ 100 participants)

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