ESA Telecom Lab - Introduction

Part of ESA Radio Frequency Systems, Payload and Technology Laboratories

An infrastructure to ESA and its partners to perform tests, analysis and characterisation of satellite telecom and TT&C systems.

Lab activity domains:
- Space Segment access platforms
- Internet of Things/Mobile communications
- Broadband communications
- TT&C and Data relay
- Communications security and public safety
Space segment access platforms

These platforms consist of communication systems providing support to R&D, pilots or various kinds of validation activity.

- **Antenna systems** for providing access to satellite capacity

- Broadband communications **hubs** and remote **terminals** providing communication capability through satellite.

- **Broadband access terminals** providing communication services through satellite service providers.

- **Access to raw satellite capacity**
Internet of Things/Mobile communications

These test beds or technical assets are used for supporting R&D or pilots/validation in the field of mobile communications or M2M (Machine-to-Machine) type of systems.

- Satellite M2M testbed and mobile low-power compact terminal

- LoRa in space testing campaigns

ETSIS-MIM (TS 102 721-1, 2011)
Broadband communications

These test beds or technical assets are used for supporting R&D or pilots/validation in the field of broadband communications.

- DVB-S2/S2X (ETSI EN 302 307) modulators, demodulators and modems
- Wideband Direct-To-Home test bed
- IPTV test bed
- DVB-RCS2 (ETSI EN 301 545) test bed
Telecommand, Tracking & Control and Data relay

These test beds and technical assets are used for supporting R&D or pilots/validation in the field of TT&C.

- **ETSI** standards compliant TT&C modem
- Command Ranging and Telemetry **baseband system**
- **High Data Rate** receiver for ECSS and CCSDS standards in X/Ku/Ka bands
**Hardware support tools**

**Spectrum analyzers**
- Freq range 3 Hz – 50 GHz, analysis BW 160 MHz
- Vector modulation analysis of 40+ digital mods incl. Zigbee/Bluetooth/…

**Modems and frequency converters**
- Satellite broadcast DVB-S2, wideband DVB-S2X
- Multi-carrier gateways
- Up and down converters for L/S/Ku bands

**Channel simulators**
- Simulate the complete signal chain
- Doppler, payload and jamming
- Bandwidth up to 600 MHz
ESA Telecom Van

- A fully equipped mobile platform for validation and demonstration of different technology platforms in the field of broadband satellite for broadcast and interactive services.
- Roof panel for mountable antennas
- 8m telescopic mast
- BGAN terminal for permanent Internet connectivity
- On-board RF equipment: oscilloscopes, vector signal analyzer, 10 MHz reference, LNAs, interference measurement antenna
THANKS FOR YOUR ATTENTION

Interest to know more?

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*Only for ESA member states