SatNOGS COMMS

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Libre Space Foundation

Libre Space Foundation

European Space Agency
Agence spatiale européenne
<table>
<thead>
<tr>
<th>COMMS</th>
<th>Power</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>OK</td>
<td>OK</td>
<td>Satellite</td>
</tr>
<tr>
<td>Fail</td>
<td>OK</td>
<td>Debris</td>
</tr>
<tr>
<td>OK</td>
<td>Fail</td>
<td>Debris</td>
</tr>
<tr>
<td>Fail</td>
<td>Fail</td>
<td>Debris</td>
</tr>
</tbody>
</table>
How long?

- Design and build COMMS subsystem
- Design and build ground station
- Send "Hello World"
What if...
Add SatNOGS station...
Apply power...
Get Telemetry

Mode: 132
Last frame: 23:04:09
Reset Count: 146

4 minutes, 15 seconds, 0 milliseconds

Battery Voltage

Battery Current
The Project

- An ESA GSTP project
- 14 months duration
- Co-founded by Libre Space Foundation

The goal!
Provide an open-hardware open-software TRL-6/7 $10 \times 10$ cm communications board suitable for cubesats, with seamless SatNOGS network integration
Space Segment

- Two RF interfaces with downlink/uplink capabilities
  - UHF
  - S-Band
- Separate power management
  - Enable/Disable subsystems on demand
  - Over current protection
  - Logging
- MCU for controlling peripherals and basic stuff
- FPGA for demanding applications
Ground Segment

- Telemetry format template
- Dashboard
- TX Capability
RF Characteristics

- **UHF**
  - TX Power: 1 W
  - Modulations: GFSK, GMSK, BPSK, QPSK
  - TX data rate: 2400 - 19200 kbit/s
  - RX data rate: 1200 - 9600 kbit/s

- **S-Band**
  - TX Power: TBA
  - Modulations: CCSDS BPSK, QPSK, IEEE 802.15.4
  - TX/RX data rates: Up to 900 kbit/s
SDR Capabilities

- TX/RX SDR capabilities in the S-Band
- 13-bit LVDS interface with the FPGA
- Reference code for CCSDS TX/RX in SDR mode
- Reference code for spectrum analysis, cognition
Pricing

- With one you get two!
- 1900 € for a flight model plus a free engineering model!
Thank you