

High-Speed X-Band Transmitter Payload for Nano- and Micro-satellites

TXC-200 is a high-speed X-band data downlink transmitter for microsatellite, cubesat, launch vehicle and airborne missions. It is a compact but powerful solution for the next-generation spacecraft operations. Aimed for the *New-Space* future, the **TXC-200** solves the problem of the large amount of data on-board the spacecraft. Furthermore, it enables a real-time 4K or multi-HD video streams from the launch vehicles, aircraft or UAV systems to the tracking ground stations.

SPECIFICATIONS:

- 2nd generation X-band transmitter payload⁽¹⁾
- Up to 200 Mbit/s data transmission
- RF output frequency range: 7.8-8.4 GHz
- RF output power: 2 W, 4 W**option*
- Modulation type: O-QPSK
- Small size (95x90x35 mm)
- Excellent power efficiency
- Rugged and reliable
- FEC data encoding (CCSDS)
- Differential data encoding

(1) 1st gen. X-band TX payload TRL9 in 2021

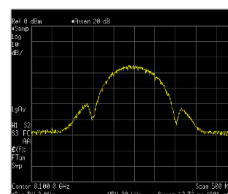
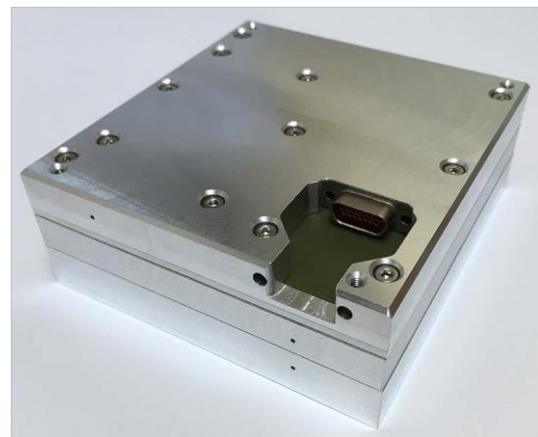
FEATURES:

- ✓ Customer-defined data scrambling
- ✓ Broad input DC voltage range 9-36 V
- ✓ In-flight programmable RF carrier frequency
- ✓ Low phase noise and spurious/harmonics
- ✓ Ultra low RF carrier frequency drift
- ✓ State-of-the-art GaN technology
- ✓ Software-only RF transmission enable
- ✓ Simple OBC protocol (ASCII+CRC)
- ✓ Serial housekeeping interface RS-485/422
- ✓ Housekeeping telemetry data
- ✓ Synchronous data+clock LVDS interface

APPLICATIONS:

- a. LAUNCH VEHICLE HD/4K VIDEO TRANSMISSION
- b. LAUNCHER AND GROUND SEGMENT INTEGRATION
- c. COMMAND, CONTROL and VIDEO DATALINKS for SPACE + SEA + AIR
- d. MISSION REAL-TIME 4K VIDEO&DATA TRANSMISSION

- e. LAUNCH VEHICLE SEPARATION / IN-ORBIT MANEUVER
- f. REAL-TIME TERMINAL GUIDANCE COMMAND
- g. TACTICAL OPERATIONS
- h. TARGET ACQUISITION AND TRACKING



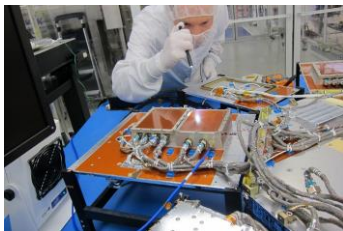
RF spectrum envelope at
200 Mbit/s data rate.



Flight heritage: 1st gen. X-band TX
payload - TRL9 in 2021 (NEMO-HD
mission, @SPACE-SI 2020).

Company's profile:

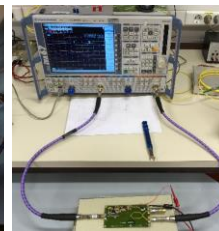
ELEP Electronics is a small company active in the field of advanced radio communication technologies. Its strength is in an innovative R&D, proven expertise in the RF/microwave/millimeter-wave engineering and high-performance hardware manufacturing. We specialize in the custom developments from DC to 1+ THz. ELEP had actively participated in the first Slovenian microsatellite development (NEMO-HD @SPACE-SI, launched in 2020). In addition, we designed and manufactured a X-band high-speed data downlink transmitter payload (1st gen.) for the NEMO-HD spacecraft - TRL9 achieved in 2021. Company's current focus are ground-segment SATCOM technologies and on-board spacecraft communication payloads. Recently, ELEP released a new state-of-the-art product: X-band data downlink transmitter payload for the micro- and nano-satellites with the data rates up to 200 Mbps. For the low Earth orbit (LEO) ground stations ELEP Electronics designed and manufactured a compact and high-performance auto-track dual-band feed (S-band: TX/RX, X-band: simultaneous RHCP/LHCP RX).



NEMO-HD microsatellite integration and testing ©SPACE-SI, ELEP 2016



X-band transmitter TVAC testing

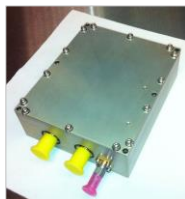


RFµwave evaluation



X-band transmitter payload final testing

ELEP Electronics' dedicated R&D for the SATCOM and aerospace market resulted in various products:



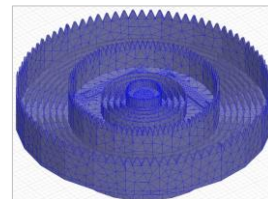
Microsatellite X-band transmitter payload (TRL9)



S+X-band feed for parabolic dish antennas



RF signal processing HW (X-band downconverter)



Advanced design and simulation of electromagnetic structures