

# XTx400 X-Band Transmitter

## Applications

- LEO High Speed Payload Downlink
- Earth Observation Missions
- Space Science Missions

The X-Band transmitter supports high speed data return for Earth Observation and space science missions. The flexible architecture allows for switching data rates, modulation and coding schemes in-orbit while maintaining RF output levels.

## Features

- Flight heritage
- Manufactured to ECSS standards
- Data rates between 10 – 400 Mbps
- Data rate switchable in-orbit
- BPSK / QPSK / 8PSK modulation
- Convolutional or TCM Encoding
- 7.5 year design life

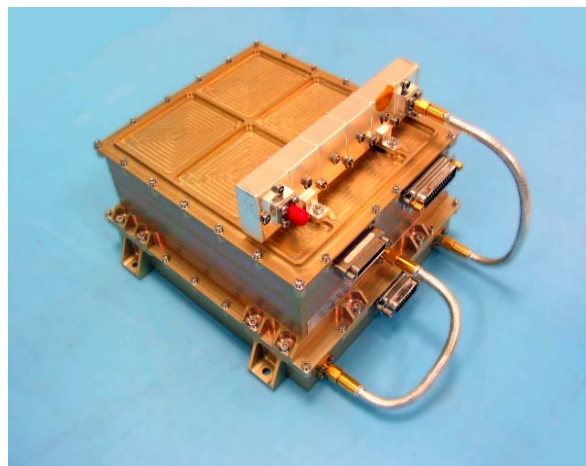
## Options

- Encryption and encoding
- Various surface finishes
- Downlink filter and antenna

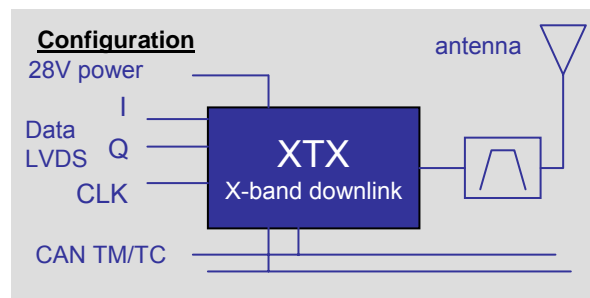
## Heritage (launch date)

- SAC-C (2000)
- GALEX (2003)
- DMC+4 (2005)\*
- RapidEye constellation (2008)\*
- Deimos-1, UK-DMC2 (2009)\*
- NigeriaSat-2, NigeriaSat-X (2011)\*
- TechDemoSat-1 (2012)
- Kazakhstan MRES (2013)

\* 6 W variant, data rate range from 20-105Mbps



X-Band Transmitter and filter

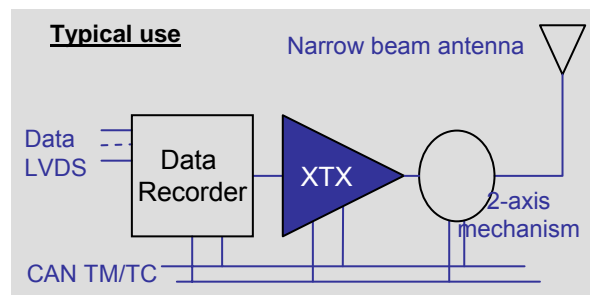


## Key Specification

- 6W / 12W RF output power
- 28V unregulated supply
- 55W / 100W DC
- 215x205x135mm (inc. filter)
- 4kg

## Interfaces

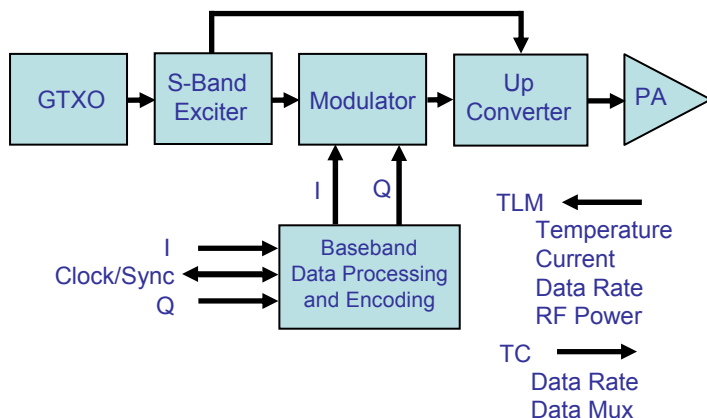
- LVDS I/Q: 3x 10-bit parallel channels, up to 10 serial channels
- 50 Ohm antenna interface (SMA)
- Dual-redundant CAN TM / TC interface



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## Options Include

- Thermal vacuum testing
- Unit can be supplied prior to environmental testing



X-Band Transmitter Block Diagram

|                       |  |
|-----------------------|--|
| Frequency Range       | 8025 to 8400 MHz $\pm$ 20 ppm  |
| RF Output Power       | 6 W or 12 W at SMA output (at 50 °C)   |
| Data Rate             | 10 - 400 Mbps  |
| Modulation            | BPSK, QPSK or 8PSK<br>Approximate Root Raised Cosine alpha = 0.35 or 0.6<br>pre-modulation filtering |
| Coding Options        | $\frac{1}{2}$ rate, k=7 Convolutional<br>or $\frac{2}{3}$ TCM (optional DVB-RS)                      |
| Filtering             | Compliant with ITU regulations   |
| Mass                  | 4 Kg   |
| Dimensions            | 215 x 205 x 135 mm (inc. filter)   |
| Power                 | 15 to 50 V, 55 W / 100 W   |
| Operating Temperature | -20 to +50 °C operating<br>-30 to +60 °C non-operating   |
| Random Vibration      | 15 G <sub>rms</sub> in all axis  |
| Radiation Tolerance   | 5 kRad (Si)  |

## SSTL is ISO9001:2008 certified

Subsystems are manufacture to:

- ECSS Q-ST-70-08C
- ECSS Q-ST-70-38C
- All work overseen by ESA- trained assembly staff

## Standard delivery service includes:

- compliance testing
- vibration test
- thermal cycling
- user manual & ICD
- test results
- export license and shipping

## SSTL Associated Products

- Antenna Pointing Mechanism
- High Speed Data Recorder

## Surrey Satellite Technology Limited

SSTL has launched over 34 satellites gaining almost 200 years in-orbit experience. SSTL draws on its world-class expertise in both small satellite platform technology and high and medium resolution optical instruments. SSTL provides complete turn-key system solutions; spacecraft, ground station, launch, operations and image processing.

SSTL is unique in the space industry; able to design, manufacture and integrate multiple satellites in-house.

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