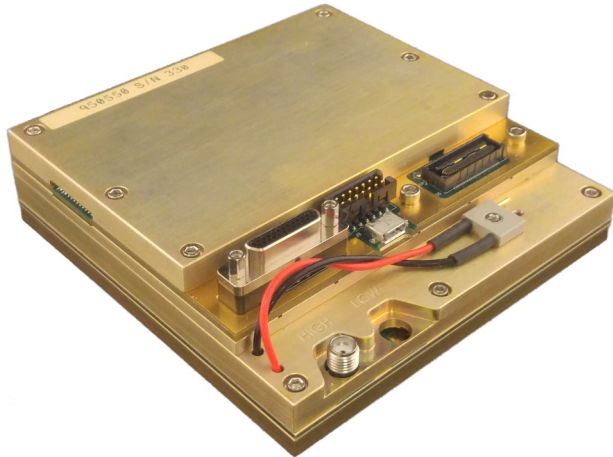


## S2DR HRTX High-Rate Software Defined DVB-S2 Transmitter



### Key Features

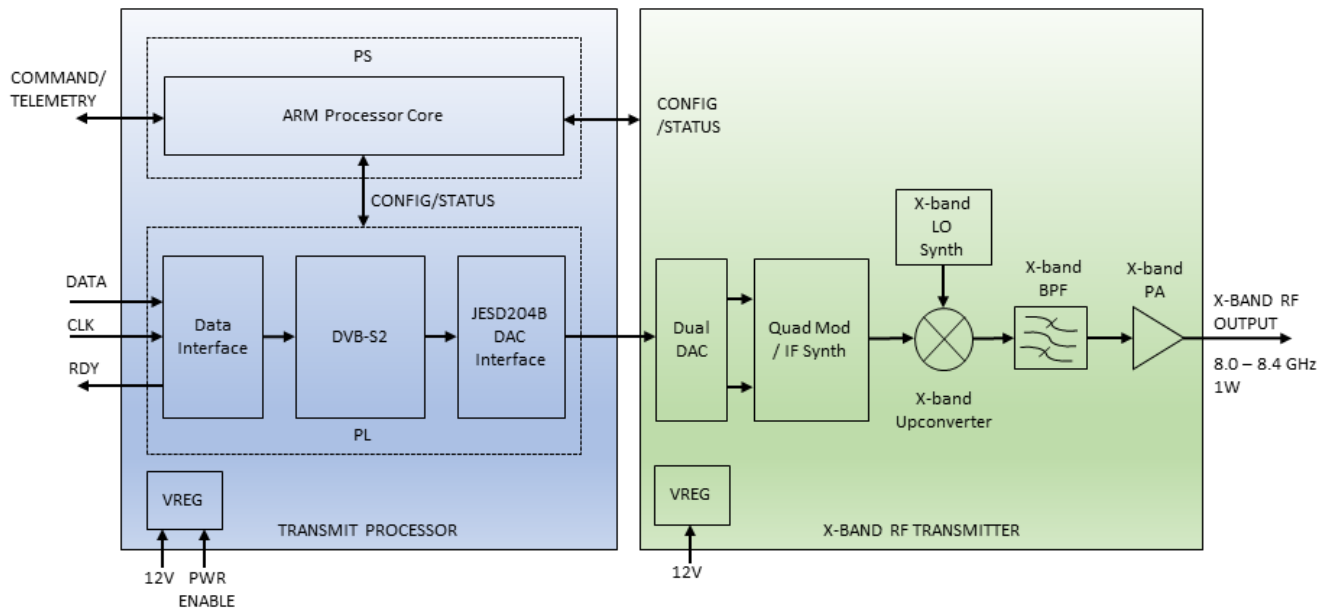
- Space-optimized SDR mission data transmitter based on the powerful Xilinx Zynq® SoC platform (Kintex 7 FPGA + Dual ARM9 Cores)
- RF Transmitter supporting X-band (8.025 GHz—8.4 GHz) and optional S-band (2.2 GHz—2.3 GHz) RF outputs
- DVB-S2 waveform support with powerful DVB-S2 multi-rate LDPC+BCH codes and a variety of modulations (QPSK, 8PSK, 16APSK, 32APSK) supports near-Shannon spectrum efficiency and link performance.
- Symbol rates up to 60Msym/s supports data rates up to 267Mbps in a 72MHz spectrum allocation
- CubeSat / Nanosat compatible SWaP in a fully shielded, ruggedized enclosure

### Overview

The S2DR HRTX is a software defined radio hardware and RF solution providing high rate mission data transfer in S and X bands. The S2DR HRTX transmitter provides 28 modulation and coding schemes enabling flexible link design and effective link robustness / link rate tradeoffs.

### Applications

- High-rate LEO space-to-ground mission data links
- High-rate intersatellite links
- Flexible / Reprogrammable mission data transponders



## S2DR HRTX High-Rate Software Defined DVB-S2 Transmitter

### Performance Specifications

#### RF:

- S-band: 2.2 GHz to 2.3 GHz, X-band: 8.0 GHz to 8.4 GHz (custom development possible to support other frequencies)
- Average Transmit Power: 1W nominal (30 dBm +1/-2 dB)
- Typical Error Vector Magnitude (EVM): <6%
- Transmit bandwidth: 72 MHz (nominal at maximum 60Msym/s symbol rate with  $\alpha=0.2$ )
- NTIA-compliant emissions

#### DVB-S2 Waveform:

- Fully compliant implementation of ETSI TS 302 207 DVB-S2 supporting all rates/modes
- Powerful LDPC + BCH codes with selectable rates ( $r=1/4$  to  $r=9/10$ ) support links down to  $E_s/N_0 = -2.35$ dB
- QPSK, 8PSK, 16APSK, and 32APSK modulation provides coded spectrum efficiencies up to 4.4 b/s/Hz.
- Pulse-shaping: Root Raised Cosine,  $\alpha=0.2$  (customizable from 0.05 to 0.35)
- CCM supported (customization for VCM/ACM available)

#### Processing:

- Xilinx ZYNQ® 7035 SOC processor (dual ARM® 9 cores, Kintex® 7 FPGA)
- Memory: 16 MB serial FLASH, 1 GB DDR3 DRAM
- Internal 10MHz reference (+/- 5ppm) and external 10MHz reference input
- Mission data and command and data handling
- Frequency, symbol rate, modulation and code rates programmable from the ground over a command/telemetry UART interface.

#### Interfaces:

- 25 pin micro-D interface connector. Provides power, command and control UART, diagnostic UART and data interfaces.
- Micro USB 2.0 (Test)
- 1 SMA RF Connectors (Receiver Input)
- Customizable mission data interface options (serial data/clock/enable/ready (standard), Spacewire, High speed Xilinx Aurora interface to seamlessly integrate with Augustus SDR receivers)

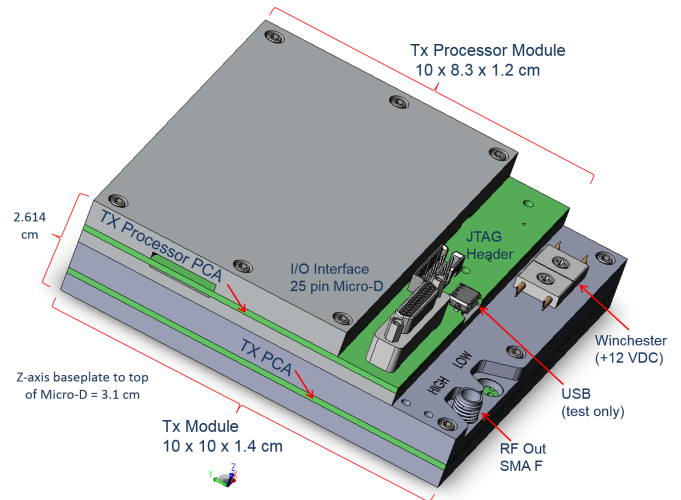
#### Power:

- Operation from 12 VDC +/-10 % power source.
- 23W typical power consumption at room temperature.

## S2DR HRTX High-Rate Software Defined DVB-S2 Transmitter

### Physical Specifications

- Two circuit cards in a reliable four-piece aluminum clamshell enclosure
- Effective RF shielding, mechanical support, mounting, large thermal mass and heat transfer to the unit's baseplate.
- Dimensions: 10.0 x 10.0 x 2.614 cm
- Mass: 500 g



### Development and Customization

- Hardware customization and custom HW peripherals available from Augustus Aerospace, including interface/connector customization
- Seamlessly integrates with Augustus HPISR Receiver
- Available with Augustus Aerospace Payload Management Software providing CCSDS-compatible flight computer messaging, sensor data file system, in-flight reconfiguration, and fault management.
- Augustus Aerospace Payload Test Application provides an environment for bench test excitation and data collection from a PC prior to flight computer integration.
- Augustus Aerospace-developed high performance signal processing and software IP developed to your unique requirements.

#### Contact Augustus Aerospace to learn more:

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