

# S2DR 2000 High-Performance Software Defined Receiver with Precision Time and Frequency Reference



## Key Features

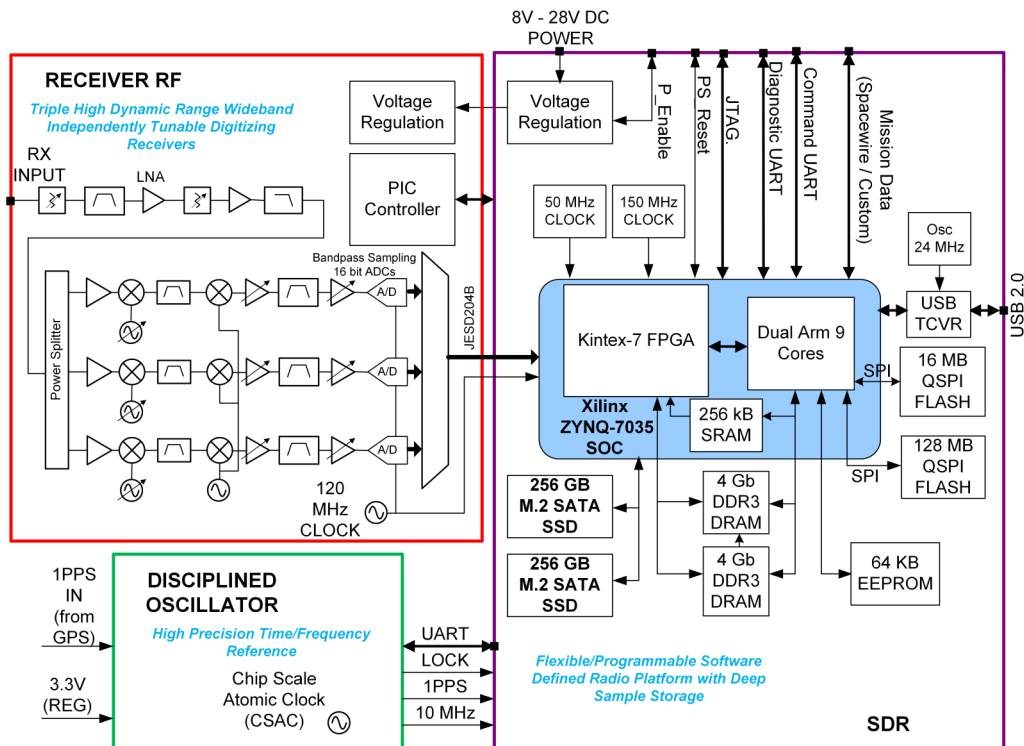
- Space-optimized SDR receiver payload based on the powerful Xilinx Zynq® SoC platform (Kintex 7 FPGA + Dual ARM9 Cores)
- Triple low noise, high linearity RF receivers capable of individually tuning <150MHz—>2GHz
- Integrated Disciplined Oscillator using Chip Scale Atomic Clock (CSAC) technology for low power, high precision frequency and time references
- CubeSat / Nanosat compatible SWaP in a fully shielded, ruggedized enclosure

## Overview

The S2DR 2000 is a software defined radio hardware and software solution providing high performance RF to digital capture capabilities with integrated precision time and frequency references and deep capture storage. The S2DR 2000 architecture enables rapid development of RF ISR and communication payloads customized to the unique requirements of LEO small satellite scientific and military missions.

## Applications

- Space-based RF sensor and ISR platforms
- Tactical radio space-based repeaters
- Precision time and frequency applications
- Multi-channel / Multiprotocol radio communications
- Flexible / Reprogrammable mission data transponders



## S2DR 2000 High-Performance Software Defined Receiver with Precision Time and Frequency Reference

### Performance Specifications

#### RF:

- Triple fully independent, isolated RX RF paths tunable from <150MHz to >2GHz
- High dynamic range dual-conversion architecture (NF: typ 3 dB, IIP3: >20 dBm @ 0dB Rf atten setting), distributed and programmable attenuation and gain control to optimize dynamic range for different applications
- 120MSPs 16bit analog-to-digital converters with JESD204B multiplexed interface
- 15MHz capture bandwidth (customization for higher bandwidths)

#### Processing:

- Xilinx ZYNQ® 7035 SOC processor (dual ARM® 9 cores, Kintex® 7 FPGA)
- Memory: 16 MB and 128 MB serial FLASH, 1 GB DDR3 DRAM, 64KB EEPROM
- Storage: 2x 256 GB M.2 SATA SSD (redundant)
- FPGA high performance independent multi-channel digital downconversion, decimation, and sample storage
- RF sample time-tagging, data management, and metadata insertion
- Mission data and command and data handling

#### Interfaces:

- 37 pin SDR I/O: UARTs for flight computer, debug, and DO. JTAG, discrete control, mission data interface
- 15 pin DO micro-D: UART, 1 PPS input (CMOS), 1 PPS output, (LVDS) 10MHz output (LVDS)
- Micro USB 2.0 (Test)
- 1 SMA RF Connectors (Receiver Input)
- Customizable mission data interface options (Spacewire, High speed Xilinx Aurora interface to seamlessly integrate with Augustus high rate mission data transmitter)

#### Precision Time and Frequency Reference:

- Chip-Scale Atomic Clock (CSAC) disciplined oscillator
- 25ns RMS time error to UTC, ADEV 1E-11 (1s)
- GPS 1PPS Input for long-term accuracy and time-tagging to GPS/UTC
- 1PPS and 10MHz LVDS outputs

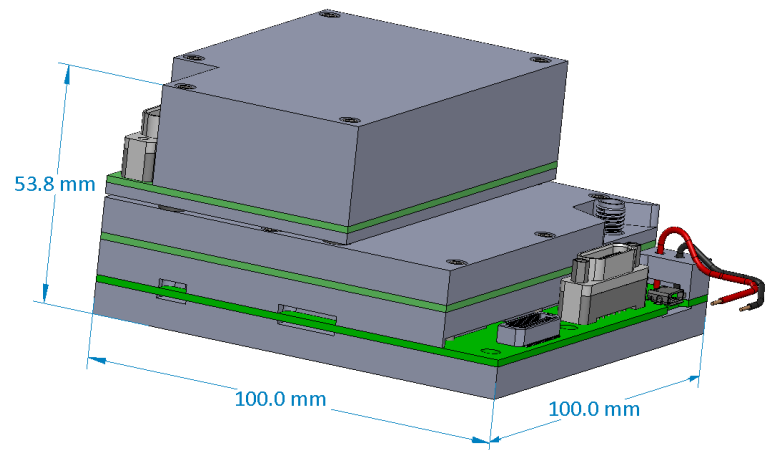
#### Power:

- 9 – 28 VDC input, 16.5W (three RX channels)
- 3.3 VDC regulated DO power, 0.6W

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### Physical Specifications

- Three circuit cards in a five piece reliable aluminum clamshell enclosure
- Dimensions: 10.0 x 10.0 x 5.38 cm
- Weight: 630 g
- Operating Case Temperature Range: -40C to +60C



### Development and Customization

- Hardware customization and custom HW peripherals available from Augustus Aerospace, including interface/connector customization
- Seamlessly integrates with Augustus High Rate Mission Data Transmitter (X-band DVB-S2 with data rates up to 220Mbps)
- 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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