



## OpenSpace quantumDRA – Virtualized Data Recorder and Archiving Application

As more and more Earth Observation (EO) and Remote Sensing (RS) data is being beamed from satellites, the infrastructure on the ground has to be more flexible, cost-effective and scalable to meet the demand. It is critical for an EO provider or Ground Station as a Service Provider (GSaaS) to be able to record, playback and stream data and provide all the downlinked data to the customer whenever needed.

Capitalizing on the benefits of virtualization and cloud technologies, Kratos has developed OpenSpace® a family of solutions that enable the digital transformation of ground systems to become a more dynamic and powerful part of space network.

The OpenSpace quantum products are individual virtualized network functions that replace traditional hardware. OpenSpace quantumDRA is a completely virtualized recorder and archiving application requiring no FPGAs or GPUs. OpenSpace quantumDRA records satellite-based sensor telemetry data during a spacecraft pass and archives the data at a high rate to disk.

OpenSpace quantumDRA addresses the challenge of managing large amounts of data produced by a satellite with limited connection time to the antenna. The virtualized recorder and archiving application stores and forwards data to the antenna for future use by the satellite operations center.

OpenSpace quantumDRA displays system health and performance and the status of each step in the



*OpenSpace quantumDRA displays system health, performance and status of streaming and recording process.*

processing and recording process from the IP input to the output. The recording application provides highly configurable options for CCSDS VCDU filtering and recording for future use by the mission operations personnel.

The recorded files are stored on a server for direct download by users, can be moved in cloud-based storage or passed on to additional processing chains. Schedule files, pass reports, and two-line element files may also be stored on the recorder.

OpenSpace quantumDRA offers the following key benefits:

- Stores data for playback or streaming in real-time
- Provides simultaneous recording and playback capability
- Archives and passes telemetry data at a high rate to storage
- Allows playback at 1X or X-times real-time speed

OpenSpace quantumDRA includes the following key features:

- Simulates contact based on telemetry simulation parameters in satellite database
- Supports RAW or CCSDS filtered recording
- Works for five concurrent recordings
- Provides a number of CCSDS filtering capabilities
- Process live data using telemetry frame network interface

## Fully Virtualized Earth Observation Signal Processing Solution

Kratos offers a completely virtualized infrastructure for EO and remote sensing applications. After digitizing the RF at the antenna using Kratos' OpenSpace SpectralNet Wideband product, the VITA 49 digital stream is processed by OpenSpace quantumRX and the OpenSpace quantumDRA, Kratos' digital recording application, which stores the data for playback or streaming in real-time.

### Technical Specifications

Description	Specification
Number of Receive Channels:	1 per OpenSpace quantumDRA instance. Multiple instances supported
Rates:	Up to 1 Gbps per channel
Data Input	VITA over UDP
Recording Modes	Support for RAW or CCSDS filtered recording
Recording Features	Supports: <ul style="list-style-type: none"><li>- Framed CCSDS data or raw data from the network</li><li>- Up to 5 concurrent recordings – 4 filtered and one raw</li></ul>
Recording Playback	Supports: <ul style="list-style-type: none"><li>- Playback for data recorded with metadata</li><li>- Playback data rate as recorded or a user selectable rate</li><li>- 'Live Playback' of an active recording session (play while recording)</li><li>- 'Looped' or repeated playback of a session</li><li>- Recording session selection by drop down or name</li><li>- Playback pause and resume</li></ul>
CCSDS Filtering	Configurable output and statistics filtering: <ul style="list-style-type: none"><li>- Output Format (Frame, VCDU, VCA_SDU)</li><li>- SCID - VCID</li></ul>
HDLC Decode	Bit-wise decoding, 16 Bit CRC Output data <ul style="list-style-type: none"><li>- Configurable output data bit reverse for MSB first encoders</li><li>- Configurable CRC data output</li></ul> Bypass mode
Error Detection and Correction	Reed-Solomon FEC CCITT CRC-16 (for CCSDS Data Link Rx payload)
Network Output Formats:	RAW Frames/CADUs CCSDS Transfer Frames/VCDUs CCSDS VCA_SDUs Filters can be applied to any CCSDS output Supports output with or without metadata headers
Data Source:	Internal BERT, Network, File Player
Network Protocol(s):	TCP, UDP



*OpenSpace® is a family of solutions that enable the digital transformation of ground systems to become a more dynamic and powerful part of space network. OpenSpace supports a variety of customer paths, goals and business models. OpenSpace SpectralNet serves as the on-ramp to digital transformation of ground systems, reliably converting and transporting RF spectrum to IP. The OpenSpace quantum products are individual virtualized network functions that replace traditional hardware. The OpenSpace Platform delivers a fully dynamic, service oriented, and orchestrated approach for ground operations.*

