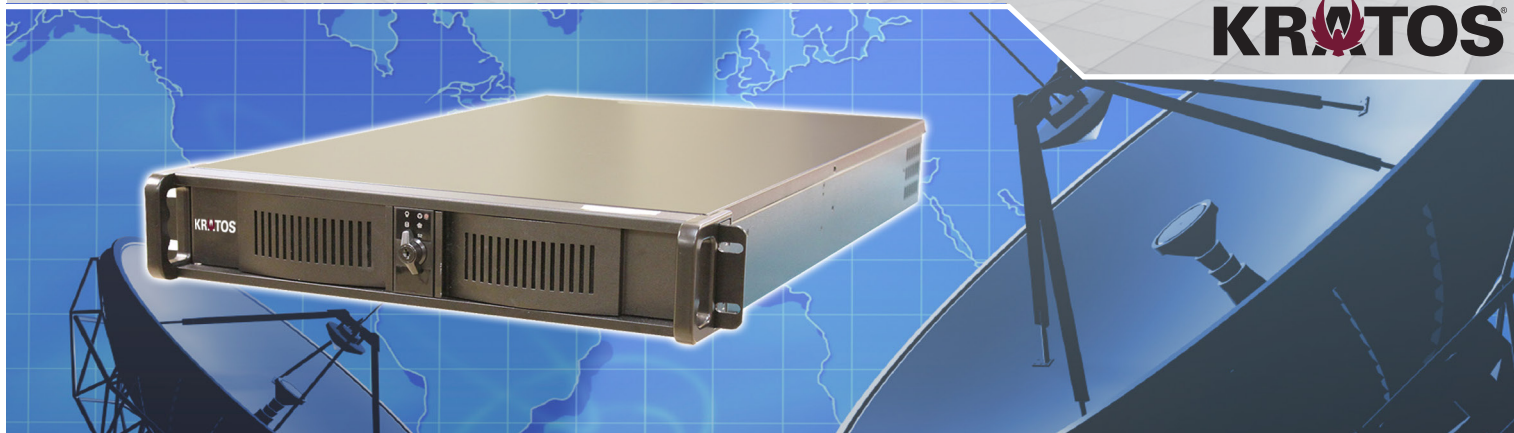


# quantum Mission Receiver

## Optimized for Earth Observation and Remote Sensing

**KRATOS**



### Overview

The Kratos quantum Mission Receiver™ (MR) is a payload data receiver specifically designed for Earth Observation and Remote Sensing missions. The quantumMR is a complete Software Defined Modem with an all-digital processing chain for high performance and pass-to-pass configurability.

quantumMR is a robust, full featured, wideband COTS product that was designed to support virtual architectures. By embracing standards such as Vita-49 and CCSDS, quantumMR is highly compatible with a virtual environment.

quantumMR capabilities include:

- Ability to support standard carrier tracking, demodulation, bit synchronization and digital processing of dual, independent Intermediate Frequency (IF) signal inputs at transmission rates adjustable up to 1.5 Gbps.
- Digital signal processing implementation for flexibility to support different demodulation and processing schemes and, and unlike legacy analog implementations, requires no calibration.
- Soft-programmable implementation allows for new capabilities to be installed without the need to return the system to the factory.

You can select from a rich feature set for single missions or span a wide range of Science, Remote Sensing, or commercial communication applications with the support of industry standards like DVB-S2 and CCSDS.

*The quantumMR is optimized for Earth Observation and Remote Sensing missions*



### Key Features

- Optimized for Earth Observation and Remote Sensing
- Dual Receiver Chains
- Tunable, Independent IFs
- Direct-PSK and DVB-S2
- BPSK, QPSK, OQPSK, 8PSK, 16QAM, 16/32 APSK, MSK
- DVB-S2 CCM and VCM

### Applications

- Remote Sensing
- DVB-S2 Reception
- Earth Imaging
- System Test
- Lights Out Operation

### Platform Benefits

- >40K MTBF
- Dual 1GbE & 10GbE
- Redundant Power Supplies
- Hardened OS
- CE Compliant

### Optional Features

- Test Modulator
- CCSDS LDPC
- Error Vector Magnitude

## Product Description

The quantumMR supports downlink processing of BPSK, QPSK, 8PSK, 16/32APSK, 16QAM and MSK signals. The mission receiver supports symbol rates from 10 Msps to 500 Msps for direct PSK Modulation signals and 10 Msps to 500 Msps for DVB-S2 signals using CCM and VCM schemes.

The demodulation processing is supplemented by bit synchronization, Pulse Code Modulation (PCM) code conversion, digital filtering, and adaptive signal equalization for transmission optimization. Multiple Forward Error Correction (FEC) options are currently supported including Viterbi, Reed-Solomon (RS), and Low Density Parity Check (LDPC) using both CCSDS and DVB-S2 standards. Output from the unit is available as 1GbE and 10GbE IP packets over Ethernet.

The quantumMR is based on industry standard modular architecture technology. This allows for field upgradability via software download. Every quantumMR comes with a user friendly GUI hosted on any commercial browser avoiding heavy, client software. Beyond GUIs, the quantumMR comes with TCP/IP interfaces for monitor and control and interoperability with the Compass Software Suite for enterprise control.

## Modem Specifications

### Waveform Processing

- Dual, Independent Channel Processing Chains
- Tunable IF Frequency: 720 +/- 200 MHz; 1200MHz +/- 325 MHz
- Modulation Capabilities: BPSK, QPSK, SQPSK, 8PSK, 16/32 APSK, 16QAM, MSK
- Symbol Rates:
  - PSK: 10Msps to 500 Msps x 2 channels
  - DVB-S2: 10Msps to 500Msps x 2 channels
- FEC Capabilities:
  - Convolutional: Single, Dual (I&Q), Stacked (Parallel) up to 8, Convolutional Interleaving
  - Reed-Solomon: CCSDS, Block Interleaving, Randomization up to 8, and unlimited Virtual-Fill
  - DVB-S2 LDPC (All MODCODS)
- Matched Filtering
  - Raised Cosine, Root Raised Cosine (0.2 to 1.0)
- Fully Complex Adaptive Base Band Equalization (ABBE)

### Data Processing

- Programmable Frame Syncs for Independent Channels
- CCSDS Frame Processing (VCDDU/APID)

### Baseband Data Interfaces

- 1GbE Output Data (VITA-49 Packets), RJ45
- 10GbE-T Output Data (VITA-49 Packets), RJ45

### Control and Status Interfaces

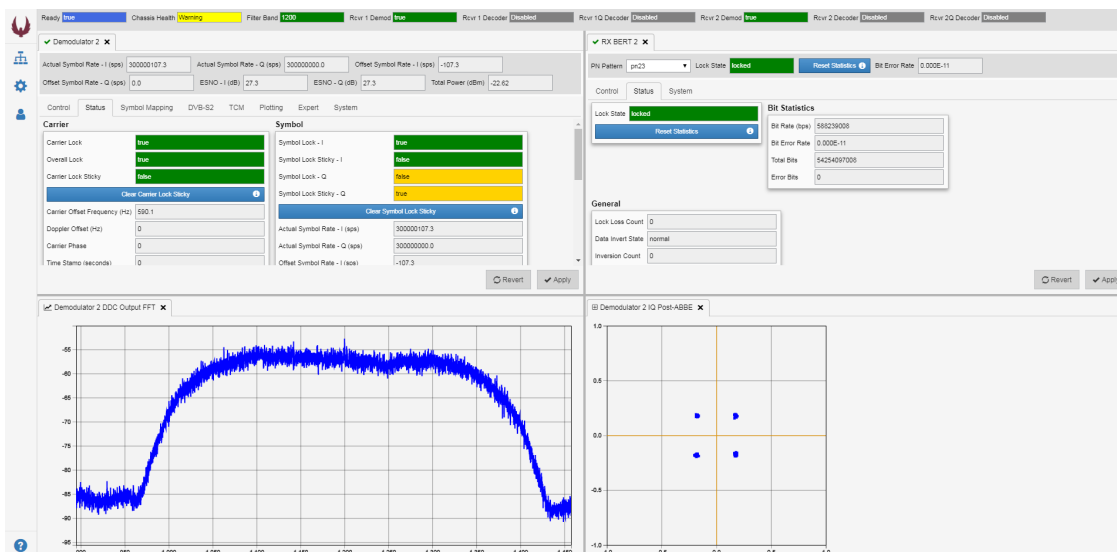
- Web-Based (HTML-5) GUI
- TCP/IP interface GEMS, REST via 1GbE
- Chassis Health and Status (Fans, Power-Supply)

### General System and Hardware

- Linux Operating System (Cent OS)
- Hot-swappable, Redundant Power Supplies for Easy Sustainment
- 2U Chassis (19 x 5.25 x 29)

### IA and Cyber

- STIG, DISA, NIST OS Hardening Available



View the performance of the quantumMR using a web browser