High-Rate Receiver 3200
For remote sensing and Earth observation

Ka-band high-rate data for Earth observation

Viasat, the world leader in remote sensing ground systems, developed the Viasat High-Rate Receiver 3200 to take maximum advantage of the 1.5 GHz spectrum allocated to Ka-band Earth Observation missions.

The Viasat High-Rate Receiver 3200 provides two independent IF channels, either one demodulator and decoder per IF channel at 1350 Msp/s per demodulator/decoder or three demodulators and decoders per IF channel at 200 Msp/s per demodulator/decoder. It achieves data rates of up to 4050 Mbps per IF channel for a total throughput of 8100 Mbps. The receiver provides digital cross-pol cancellation between the IF channels using Viasat’s patented algorithm. The single channel configuration allows two receivers to be utilized for high-rate dual polarized links, achieving up to 8.1 Gbps downlink capability.

The receiver is designed for full remote lights-out operational scenarios. All control capability is provided through web-based GUI and JSON-based management and control. All non-volatile storage is sanitizeable for use in operational data sensitive applications.

Optional front-end processor for data capture, processing, and archive

The Viasat High-Rate Receiver Data Processor extends the features of the Viasat High-Rate Receiver 3200 by providing data capture, processing and archive for up to 4 Gbps transfer rates. The processor can ingest two independent data streams and provides streaming and playback over 10 GbE Ethernet from the Viasat High-Rate Receiver 3200.

The Viasat Data Processor processes and archives data at rates up to 4000 Mbps and performs raw-data and processed-data archiving simultaneously. The processor streams raw or de-framed data out in near-real-time and provides streaming playback of archived raw or de-framed data all over the 10/100/1000 Base-T or 1000/10 GbE interface. FTP and SAMBA file transfer methods are also provided.

High-Rate Receiver 3200 at-a-glance

The Viasat High-Rate Receiver 3200 provides up to 8.1 Gbps transfer rates. These unprecedented data rates offer a substantial increase in data density for next-generation Ka-band Earth Observation satellite applications.

› Designed for high-rate Ka-band and other high-rate satellite-to-ground links
› Total throughput of 8100 Mbps in dual channel mode
› Extremely high-rate single channel downlinks
› Single or dual modulator channel(s) to support full loopback testing
› Internal loopback and BERT capabilities
› Digital cross-polarization cancellation
› Remote lights-out operation

OPTIONAL DATA PROCESSOR

› Optional equipment that adds data capture, archiving, sorting, and playback capability to the High-Rate Receiver 3200
› Data capture, processing, and archive for up to 4 Gbps transfer rates
› RAW bitstream archiving
› VCID sorting and storage of TM and AOS framed data

CUSTOM VERSIONS AVAILABLE

› Viasat can support unique mission requirements with custom and configured COTS variants
› Contact Viasat with your unique mission requirements
High-Rate Receiver 3200

**MODULATIONS AND RATES**

<table>
<thead>
<tr>
<th>Modulations</th>
<th>BPSK, QPSK, OQPSK, 8PSK, 16APSK, 32APSK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol rates</td>
<td>100 to 1350 MBd × 2 channels</td>
</tr>
<tr>
<td></td>
<td>7.5 to 200 MBd × 6 channels</td>
</tr>
<tr>
<td>Data rates</td>
<td>100 to 4050 Mbps × 2 channels</td>
</tr>
<tr>
<td></td>
<td>7.5 to 600 Mbps × 6 channels</td>
</tr>
<tr>
<td>Pulse shaping filters</td>
<td>Root-raised cosine (0.2 to 1.0), Unshaped (sinc spectrum/I&amp;D)</td>
</tr>
</tbody>
</table>

**FEC**

- **Convolutional/Viterbi**
  - CCSDS r=1/2 (131.0-B)
  - 4I+4Q, 8I+8Q (450-SNUG)
  - 2/3, 3/4, 4/5, 7/8, (131.0-B)

- **4D-8PSK-TCM**
  - All CCSDS rates (401.0-B)
  - CCSDS (131.0-B); DVB-S (ETSI EN 300 421); Intelsat (IEEE 308)
  - Shortening: 0 to 32

- **Reed-Solomon interleave**
  - CCSDS; Convolutional
  - Interleave depth: 1 to 16

- **LDPC**
  - CCSDS r=7/8, (131.0-B)
  - CCSDS r=1/2, (131.0-B)

**ACM/VCDS R=1/2 (OPTIONAL)**

- **CCSDS SCCC**
  - (131.0-B)
  - Modcods 1-22

- **DVB-S2/S2X**
  - (ETSI EN 302 307-1/-2)
  - Modcods 1-28

**FEC THROUGHPUT**

- **QPSK and OQPSK**
  - Convolutional/Viterbi: 200 MBd
  - Reed-Solomon: 200 MBd
  - LDPC: 1350 MBd
  - Uncoded: 1350 MBd

- **8PSK**
  - 4D-8PSK-TCM: 400 MBd
  - Reed-Solomon: 400 MBd
  - Uncoded: 1350 MBd

- **SCCC**
  - 500 MBd

- **DVB-S2/S2X**
  - 400 MBd

- **Advanced data processing, recording, and TCP/IP data distribution**
  - Available with Viasat Data Processor (VDP)

**OTHER**

- **Size**
  - 19 × 3.5 × 21 in (EIA rack-mountable)

- **Weight**
  - ≤ 30 lb

- **Certification**
  - CE

**ADDITIONAL FEATURES**

- **Receive equalization**
  - Static tilt compensation
  - Digital adaptive equalization

- **Cross-polarization interference cancellation**
  - Digital adaptive cancellation

- **Transmit equalization**
  - Static tilt compensation

- **Frame processing**
  - CCSDS, RS DVB, asynchronous data layers

- **Randomization**
  - Synchronous (CCSDS, DVB-S); Asynchronous (WorldView)

- **Built-in test**
  - Bit error rate tester
    - Transmit and receive; 2^23-1, 2^25-1, 2^21-1, 2^21-1 PRBS (ITU-T O.150) and other sequences
  - Link reporting
    - E_b/N_0, offsets, decoder and frame processing statistics
  - GUI
    - Constellation, spectrum, digital equalizer display
  - IF loopback
    - Internal loopback without cable changes
  - Transmit noise generator
    - AWGN with calibrated E_b/N_0 (0 to 30 dB)

- **Baseband data metadata**
  - Time-tagging, frame quality information
  - 1:1; hot-swappable

**INTERFACES**

- **IF signal**
  - SMA female
  - 720 MHz band frequency: 720 ± 200 MHz; tunable
  - 1200 MHz band frequency: 1200 ± 400 MHz; tunable
  - 2400 MHz band frequency: 2400 ± 750 MHz; tunable
  - TX signal level: –60 to 0 dBm
  - RX receive level: –50 to –10 dBm

- **Baseband data**
  - 10G Ethernet (SFP+)
  - CML (SMA), LVDS (SMA/RJ45/D-SUB)

- **Monitor and control**
  - 10/100/1000 Ethernet (RJ-45)
  - JSON-RPC over TCP/IP
  - Web browser

- **Local interface**
  - Front panel display

- **Ext. frequency reference**
  - SMA female, 10 MHz

- **Mains power**
  - 90 to 264 VAC, 47 to 63 Hz; ≤300 W

**Modcods 1-22**

**Modcods 1-28**

**Modcods 1-28**

**Available with VHR-1200**

1 Consult factory for availability

2 Optional functionality

3 Available with VHR-1200

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