

# 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 Msps per demodulator/decoder or three demodulators and decoders per IF channel at 200 Msps 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 sanitizable 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

<b>Modulations</b>	BPSK, QPSK, OQPSK, 8PSK, 16APSK <sup>2</sup> , 32APSK <sup>2</sup>
<b>Symbol rates</b>	<ul style="list-style-type: none"> <li>&gt; 100 to 1350 MBd × 2 channels</li> <li>&gt; 7.5 to 200 MBd × 6 channels</li> </ul>
<b>Data rates</b>	<ul style="list-style-type: none"> <li>&gt; 100 to 4050 Mbps × 2 channels</li> <li>&gt; 7.5 to 600 Mbps × 6 channels<sup>3</sup></li> </ul>
<b>Pulse shaping filters</b>	Root-raised cosine (0.2 to 1.0), Unshaped (sinc spectrum/I&D)

## FEC

<b>Convolutional/Viterbi</b>	CCSDS $r=1/2$ (131.0-B)
> <b>Stacking</b>	4I+4Q, 8I+8Q (450-SNUG)
> <b>Puncturing</b>	2/3, 3/4, 4/5, 7/8, (131.0-B)
<b>4D-8PSK-TCM</b>	All CCSDS rates (401.0-B)
<b>Reed-Solomon</b>	CCSDS (131.0-B); DVB-S (ETSI EN 300 421); Intelsat (IESS-308)
> <b>Shortening</b>	0 to 32
<b>Reed-Solomon interleaving</b>	CCSDS; Convolutional
> <b>Interleave depth</b>	1 to 16
<b>LDPC</b>	CCSDS $r=7/8$ , (131.0-B) CCSDS $r=1/2^1$ , (131.0-B)

## ACM/VCM CCSDS R=1/2 (OPTIONAL)

<b>CCSDS SCCC<sup>1,2</sup> (131.2-B)</b>	Modcods 1-22
<b>DVB-S2/S2X<sup>1,2</sup> (ETSI EN 302 307-1/-2)</b>	Modcods 1-28

## FEC THROUGHPUT

<b>QPSK and OQPSK</b>	<ul style="list-style-type: none"> <li>&gt; Convolutional/Viterbi: 200 MBd</li> <li>&gt; Reed-Solomon: 200 MBd</li> <li>&gt; LDPC: 1350 MBd</li> <li>&gt; Uncoded: 1350 MBd</li> </ul>
<b>8PSK</b>	<ul style="list-style-type: none"> <li>&gt; 4D-8PSK-TCM: 400 MBd</li> <li>&gt; Reed-Solomon: 400 MBd</li> <li>&gt; Uncoded: 1350 MBd</li> </ul>
<b>SCCC</b>	> 500 MBd
<b>DVB-S2/S2X<sup>1,2</sup></b>	> 400 MBd
<b>Advanced data processing, recording, and TCP/IP data distribution</b>	Available with Viasat Data Processor (VDP) <sup>2</sup>

## OTHER

<b>Size</b>	19 × 3.5 × 21 in (EIA rack-mountable)
<b>Weight</b>	≤ 30 lb
<b>Certification</b>	CE

## ADDITIONAL FEATURES

<b>Receive equalization</b>	<ul style="list-style-type: none"> <li>&gt; Static tilt compensation</li> <li>&gt; Digital adaptive equalization</li> </ul>
<b>Cross-polarization interference cancellation</b>	Digital adaptive cancellation
<b>Transmit equalization</b>	Static tilt compensation
<b>Frame processing</b>	CCSDS, RS DVB, asynchronous data layers
<b>Randomization</b>	Synchronous (CCSDS, DVB-S); Asynchronous (WorldView)
<b>Built-in test</b>	
> <b>Bit error rate tester</b>	Transmit and receive; 2 <sup>23</sup> -1, 2 <sup>15</sup> -1, 2 <sup>11</sup> -1, 2 <sup>9</sup> -1 PRBS (ITU-T O.150) and other sequences
> <b>Link reporting</b>	$E_s/N_0$ , offsets, decoder and frame processing statistics
> <b>GUI</b>	Constellation, spectrum, digital equalizer display
> <b>IF loopback</b>	Internal loopback without cable changes
> <b>Transmit noise generator</b>	AWGN with calibrated $E_s/N_0$ (0 to 30 dB)
<b>Baseband data metadata</b>	Time-tagging, frame quality information
<b>Power supply redundancy</b>	1:1; hot-swappable

## INTERFACES

### IF signal

> <b>Connector</b>	SMA female
> <b>720 MHz band frequency</b>	720 ± 200 MHz; tunable
> <b>1200 MHz band frequency</b>	1200 ± 400 MHz; tunable
> <b>2400 MHz band frequency</b>	2400 ± 750 MHz; tunable
> <b>TX signal level</b>	-60 to 0 dBm
> <b>RX receive level</b>	-50 to -10 dBm

### Baseband data

> <b>Connector</b>	10G Ethernet (SFP+)
> <b>Protocol</b>	CML (SMA), LVDS (SMA/RJ45/D-SUB)

### Monitor and control

> <b>Remote connector</b>	10/100/1000 Ethernet (RJ-45)
> <b>Remote protocol</b>	JSON-RPC over TCP/IP
> <b>Remote GUI</b>	Web browser
> <b>Local interface</b>	Front panel display
> <b>Ext. frequency reference</b>	SMA female, 10 MHz

### Mains power

90 to 264 VAC, 47 to 63 Hz; ≤300 W

<sup>1</sup>Consult factory for availability

<sup>2</sup>Optional functionality

<sup>3</sup>Available with VHR-1200

## Global headquarters

6155 El Camino Real, Carlsbad, CA 92009-1699, USA

## Sales

TEL +1 888 842 7281 (US Toll Free)  
+1 678 924 2400

EMAIL AS-Sales@viasat.com

WEB viasat.com/antenna-systems

