

## HIGH-RATE RECEPTION FOR THE SMALL-SATELLITE MARKET

- » Multi-mission
- » Small-Sat/Cube-Sat ready
- » Reliable and secure
- » Innovative
- » Fully upgradeable



From the world leader in Earth Observation ground systems, the Viasat High-Rate Receiver 800 provides high-speed demodulation and decoding of wideband transmissions at X-band. Supporting both the emerging small-satellite market and the legacy large-satellite market, a single receiver can provide multi-channel support up to 900 Mbps data rate. With two IF inputs, each with one demodulator, it is particularly suited for dual-channel or dual polarization satellites with wideband downlinks.

Built on the same hardware platform as the High-Rate Receiver 1200, the 800 is suited for lower-rate applications, but with the same exceptional performance. The receiver is designed to grow as the user's demands increase, whether it be with evolving small-satellite fleet designs or entirely new satellites and constellations. The unit is fully and remotely upgradeable to the 1200, when higher rates and more complex modulations are needed, providing a solid investment well into the future.

The entire ground station is more efficient since the receiver simplifies the station design and maximizes reliability. With user selectable IF frequency bands and multi-channel tuning, legacy station components can be eliminated and overall station design optimized. The high reliability, FPGA/Linux-based design maximizes station reliability, ensuring images are received when it counts.

The receiver interfaces to popular image processors through ECL or 10 GbE connections and is typically used with a companion Viasat data processor to provide further data processing, data storage, and FTP and TCP forwarding.

The true multi-mission design allows it to be used in a variety of applications, from multi-satellite ground stations to satellite test-bench environments.

## HIGH-RATE RECEIVER 800 AT-A-GLANCE

### Hardware Advantages

- » Two IF inputs
- » One demodulator per IF
- » Test modulator
- » 900 Mbps total throughput
- » Advanced coding
- » Adaptive equalization
- » Compact 2U design

### Optimizes System Design

- » User selectable input band
- » Tunable IF frequency
- » Multi-mission design

### User Friendly

- » All web GUI design
- » Intuitive JSON interface

### Security

- » Hardware-based design
- » Linux-based M&C

### Reliability

- » Non-PC based
- » Redundant power supplies
- » User serviceable fans
- » MIL-STD-810 tested

### Options

- » VDP processor/storage
- » LVDS or CML output
- » Customized waveforms

## SPECIFICATIONS

### MODULATIONS AND RATES

Modulations	BPSK, QPSK, OQPSK, 8PSK
Symbol Rates	7.5 to 150 MBd x 2 channels
Baseband Interfaces	» Dual 10 GbE » ECL, data/clock interface
Data Rates	7.5 to 450 Mbps x 2 channels
Pulse Shaping Filters	Root-raised cosine (0.2 to 1.0), Unshaped (sinc spectrum/I&D)

### FEC

Convolutional/Viterbi	CCSDS $r=1/2$ (131.0-B)
» Puncturing <sup>1</sup>	2/3, 7/8 (131.0-B)
4D-8PSK-TCM	All CCSDS rates (401.0-B)
Reed-Solomon	CCSDS-223, -239 (131.0-B); DVB-S-239 (ETSI EN 300 421); Intelsat-235 (IESS-308)
» Shortening	0 to 32
» Interleave Type	CCSDS; Convolutional
» Interleave Depth	1 to 16

### FEC THROUGHPUT

BPSK	» Uncoded: 150 MBd » Reed-Solomon: 150 MBd
QPSK AND OQPSK	» Uncoded: 150 MBd » Convolutional/Viterbi: 150 MBd » Reed-Solomon: 150 MBd
8PSK	» Uncoded: 150 MBd » 4D-8PSK-TCM: 150 MBd » Reed-Solomon: 150 MBd

### ADDITIONAL FRAME PROCESSING

Randomization	CCSDS, DVB-S, Intelsat, WorldView
Primary Framing Layer	CCSDS, DVB-S, Intelsat
Secondary Framing Layer	Asynchronous
Frame Length	16 to 4096 bytes
Advanced Data Processing, Recording, and TCP/IP Data Distribution	Available with Viasat Data Processor (VDP) <sup>2</sup>

### ADDITIONAL FEATURES

Receive Equalization	Static tilt compensation Digital adaptive equalization
<b>Built-in Test</b>	
» Bit Error Rate Tester	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 0.150) and other sequences
» Link Reporting	Es/NO, offsets, decoder and frame processing statistics
» GUI	Constellation, spectrum, digital equalizer display
» IF Loopback	Internal loopback without cable changes
» TX Noise Generator	AWGN with calibrated Es/NO (0 to 30 dB)
Baseband Data Metadata	Time-tagging, frame quality information

### INTERFACES

<b>IF Signal</b>	
» Connector	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	-50 to 0 dBm
» RX Receive Level	-50 to -10 dBm
<b>Baseband Data</b>	
» Protocol	» ECL (SMA) » 10G Ethernet (SFP+)
» Optional Protocols <sup>1</sup>	CML (SMA), LVDS (SMA/RJ45/D-SUB)
» Data Format	Framed or unframed; with metadata
<b>Monitor and Control</b>	
» Remote Connector	10/100/1000 Ethernet (RJ-45)
» Remote Protocol	JSON-RPC over TCP/IP
» Remote GUI	Web browser
» Local Interface	Front panel display
<b>External Reference Input</b>	10 MHz (SMA)
<b>Mains Power</b>	90 to 264 VAC, 47 to 63 Hz; ≤300 W
<b>Power Supply Redundancy</b>	1:1; dual inputs
<b>OTHER</b>	
Size	19 x 3.5 x 21 in (EIA rack-mountable)
Weight	≤15 kg
Certification	CE

### NOTES

<sup>1</sup> Non-standard functionality, consult factory for availability

<sup>2</sup> Separate optional unit



## CONTACT

### SALES

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