



HRD-200B High-Rate Demodulator

Digital Signal Processing of X-Band EOS satellite reception



Orbital's HRD-200B high-rate demodulator is a versatile digital receiver used in the reception of standard EOS-DB Satellite formats, down-linked in X-band. This high-quality Quorum Communications Digital Signal Processing (DSP) demodulator provides repeatable performance, long-term operation without component drift, and flexible multi-mode operation for current and future satellite formats.



Features

- 1U Rack Enclosure.
- FPGA based software defined demodulator
- SQPSK/QPSK/BPSK demodulation up to 40 MSPS
- SQPSK/QPSK/BPSK BER performance within 0.2 dB of theoretical, typical
- Hardware Viterbi decoding for FEC Encoded downlinks
 - Supports single and dual channel decoding
- 720 MHz RF input
- -60 dBm to 0 dBm input range
- USB (optional), RS-422, LVDS, and 50 ohm TTL clock and NRZ data outputs
- Ethernet and USB (optional) control for setup, tuning, mode selection, and status
- 2 line, 20 character LCD display for status and signal level readout
- Displays estimated received Eb/No
- Variable root raised-cosine filters (RRC)
- Demodulates the following satellites X-Band downlink provided on 720MHz I/F
 - Terra, Aqua, NPP, JPSS1, FY3 and Oceansat 2

Applications

- Demodulation of EOS satellite signal formats
- Aqua, Terra, NPP, JPSS1, FY3-MPT, and Oceansat 2 (optional) satellite reception

RF

Input Frequency.....	720 MHz
Frequency Tuning Step Size	Fixed 720 MHz
Input Dynamic Range	-60 to 0 dBm nominal
Input Impedance	50 ohms
Image Rejection.....	>60 dB
IF Frequency.....	140 MHz
IF Bandwidth (SAW Filter)	57 MHz
Signal Strength (RSSI) Output.....	0.5 to 3 VDC, 30mV/dB nominal

Demodulator (DSP)

Demodulator Modes.....	SQPSK, QPSK, BPSK
Demodulator Implementation Loss	< 0.2 dB at 10E-6 BER (QPSK/BPSK), typical
Baseband Filters.....	Root Raised Cosine (RRC), variable α

Data

Supported Symbol Rates	1 - 40 MSPS
Convolutional Decoding.....	Viterbi rate 1/2, single and dual channel

Interface

RF Input / IF Test Port.....	Female Type N
Control Interface.....	Ethernet / USB
Control Interface Connector.....	Ethernet / RJ45
USB	USB Type B
Data / Clock Interface.....	RS-422, LVDS, and 50 ohm TTL
Data / Clock Interface Connector.....	50 ohm TTL - SMA female
RS-422, LVDS Outputs.....	15p Female Subminiature D

Electrical, Mechanical, and Environmental

Input Voltage Frequency.....	100-240 VAC, .5A max, 50/60Hz
Input Power Connector	NEMA Socket
Power Consumption.....	120VAC x 0.247amp = 29.64watts
Operating Temperature	0-50° C (32-122° F) non-condensing
Size	19" rack standard, 1U, ~25cm (10") deep
Support	Fixed rear side rails
Weight.....	4.1 kg (9 lbs)