



HI-BEAM P1



HI-BEAM P2

The Highly Integrated Bandwidth Efficient Advanced Modulation (HI-BEAM) Transceivers are small, low SWAP, high-data-rate modems. The transceiver provides two-way user data rates using the DVB-S2 waveform. With Low Density Parity Check (LDPC)/Bose-Chaudhuri-Hocquenghem (BCH) error correcting codes, the DVB-S2 standard provides performance within 1 dB of Shannon's theoretical limit. The DVB-S2 standard provides for adjustment of the modulation (QPSK, 8PSK, 16APSK) and code rate (1/4 to 9/10) to provide for optimum power or spectral efficiency during operations. The range over the full range of modulation and code rates provides for a 15 dB adjustment in signal level and a change in spectrum efficiency from 0.49 to 3.57 bits/Hz. The HI-BEAM modems are available in 2 configurations: the 180Mbps P1 modem, and the 810Mbps P2 modem.

#### PERFORMANCE (IF LOOPBACK)

Mod	LDPC Code Identifier	16K BLOCK SIZE		64K BLOCK SIZE	
		Special Efficiency	HI-BEAM Target (Per = 1e-6)	Spectral Efficiency	HI-BEAM Target (Per = 1e-6)
		bits/sym	Es/No (dB)	bits/sym	Es/No (dB)
QPSK	1/4	0.37	-1.0	0.49	-0.9
QPSK	1/3	0.63	0.5	0.66	0.3
QPSK	2/5	0.76	1.5	0.79	1.2
QPSK	1/2	0.85	2.1	0.99	2.5
QPSK	3/5	1.16	3.9	1.19	3.7
QPSK	2/3	1.29	4.8	1.32	4.6
QPSK	3/4	1.42	5.8	1.49	5.5
QPSK	4/5	1.51	6.4	1.59	6.2
QPSK	5/6	1.60	6.9	1.65	6.7
QPSK	8/9	1.73	8.0	1.77	7.7
QPSK	9/10	N/A	N/A	1.79	7.9
8PSK	3/5	1.73	7.3	1.78	7.0
8PSK	2/3	1.92	8.2	1.98	8.1
8PSK	3/4	2.12	9.5	2.23	9.4
8PSK	5/6	2.38	11.0	2.48	10.9
8PSK	8/9	2.58	12.4	2.65	12.2
8PSK	9/10	N/A	N/A	2.68	12.5
16APSK	2/3	2.55	10.7	2.64	10.5
16APSK	3/4	2.81	12.0	2.97	11.7
16APSK	4/5	2.98	12.7	3.17	12.5
16APSK	5/6	3.16	13.3	3.30	13.1
16APSK	8/9	3.42	14.6	3.52	14.4
16APSK	9/10	N/A	N/A	3.57	14.6

#### APPLICATIONS

The HI-BEAM modems are ideally suited for IP centric applications where small size, weight and power (SWAP) is needed for operation outdoors in an uncontrolled environment. The modem meets the needs for:

- » Intelligence/Surveillance/Reconnaissance (ISR) data links
- » Backbone connections for ground/airborne/satellite networks
- » SCPC SATCOM links
- » Wireless and mobile backhaul
- » Maritime/offshore communications
- » Corporate networking
- » IPTV head ends
- » Content delivery
- » Point to multi-point IP networks

The HI-BEAM modems offer high-speed, high-performance, flexibility and compatibility in a Single Channel Per Carrier (SCPC) modem. Part of this flexibility comes from the ability to offer a continuous range of data rates from 500 kbps to 180Mbps (P1 Modem) or 810 Mbps (P2 Modem). HI-BEAM incorporates the latest technology in advanced modulation and coding, providing cutting-edge capability in power and bandwidth efficiency.

# HI-BEAM Transceiver Specifications

PARAMETER	HI-BEAM P1	HI-BEAM P2
<b>Input/Output Interface</b>		
IF frequency	950 to 2150 MHz for both Tx and Rx signals	
RF Connector	50 Ohm SMA	
Rx power level	-65 to -132 dBm/Hz	
Tx power level	+15 to -30 dbm	-20 to -70 dBm
DC input power	9 to 28vdc*	9-36vdc*
DC power consumption	17 Watts at 50 Msps in both directions	37 Watts at 135 Msps in both directions
Data interface	Auto switching 10/100/1000 Base-T Ethernet	
Configuration and Status	Auto switching 10/100 Base-T Ethernet using web-based GUI	
Received Signal Strength Indicator	Yes via configuration and status Ethernet port	
IP encapsulation	Subset of Generic Stream Encapsulation (GSE)	
IPv4 and IPv6 capable	Yes	Yes
GUI control of far-end modem settings	Optional	Yes
Maximum user data rate	180 Mbps using 16APSK	810 Mbps using 8PSK
<b>DVB-S2 Waveform</b>		
Modulation	QPSK, 8PSK, 16APSK	
Roll-off factor	0.2, 0.25, 0.35	
Symbol Rates in increments of 100 Ksps	1 to 50 Msps for all modulations	1 to 300 Msps for QPSK, 8PSK 1 to 200 Msps for 16APSK
Tx and Rx (two-way) at each node	Synchronous or Asynchronous	
Code Rates	See performance table	
Block Size	16K and 64K	64K (16K Optional)
Receiver ACM and VCM capable	Yes	Yes
<b>Physical</b>		
Size	9.0" x 6.25" x 1.4"	10" x 6.6" x 1.5"
Weight	2.2 lb	2.9 lb

\* Nominal voltage is 24 vdc

## ENVIRONMENTAL

- » MIL-STD-810G Specification and Testing
- » Weather tight housing
- » Cooled by conduction through housing (fanless)
- » Ambient temperature: - 20° to +60° C
- » Storage temperature: -40° to +85° C
- » Shock and vibration consistent with fixed wing and helicopter environments
- » 95% max relative humidity (non-condensing)
- » EMI requirements according to FCC rules part 15

## OPTIONAL FEATURES

- » 16K Block Size for HI-BEAM P2
- » SNMP control and monitoring
- » Full GSE encapsulation
- » MPE encapsulation
- » Transmitter ACM/VCM capable
- » AES 256 TRANSEC Cover
- » HI-BEAM P1 Far-End Remote Control



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