

BM6500 Orion DVB-S/S2 Modulator

2 form factors: 1RU stand-alone system or integrated in 1RU encoder

Orion is a state-of-the-art modulator designed for satellite operations in full compliance with DVB-S, DVB-S2, and DVB-DSNG standards, as well as the latest requirements about Carrier ID defined in ETSI 103 129. It provides operators with best-in-class performance as measured by high SNR value, excellent shoulder levels, and low phase noise, achieving full L-Band (950/2150 MHz) or IF Band (50/180 MHz) coverage with a large, flexible bitrate range of 0.25 to 200 Mbps. The BM6500 offers MPEG-TS input over ASI or IP, signal scrambling (BISS-1, BISS-E), and opportunistic data insertion (MultiProtocol Encapsulation). Control is over IP via an embedded Web server or standard SNMP monitoring and control systems.

The BM6500 is designed to deal with the physical layer scrambling requirements of ETSI EN 302 307. With appropriate receivers, it can operate in any of three different modes: CCM (Constant Coding Modulation), VCM (Variable Coding Modulation), or Seamless ACM (Adaptive Coding and Modulation with no video interruptions). Orion combines exceptionally flexible input bit rate adaptation—with choices between PCR adaptation, Padding insertion, and Dummy BB Frame insertion—with a high output baud rate (up to 68 MBaud), fully feeding a 72 MHz teleport transponder for best OPEX. An internal PRBS generator can be used to generate a RF spectrum without any valid signal input.



Features and Options

Models (see Ordering Information on back of sheet)

- **BM6500 1RU stand-alone unit**
- **BMi6500 embedded unit integrated into Telairity 1RU encoder models**
 - Either L-Band or IF-Band RF output available with both models

Standards

- DVB-S2: EN 302 307; DVB-S: EN 300 421; DVB-DSNG: EN 301 210
- DVB-ASI: EN50083-9, ETSI TR 101 891
- MPEG-TS: ISO/IEC 13818-1; MPEG-2 PSI Tables (PAT & PMT): EN 300 468
- Carrier ID: ETSI 103 129

Inputs

- 2 x ASI – BNC connectors, 75Ω
 - MPEG-TS (188/204 bytes)
- 1 x MPEG over IP – RJ-45
 - SPTS over IP (RTP / UDP) following SMPTE-2022
- Flexible bit rate adaptation
 - PCR adaptation / Padding / Dummy frame
- Signal scrambling up to 200 Mbps
 - BISS (single / multiple programs): modes 0, 1, E

RF Outputs

- L-Band: 950 to 2150 MHz / IF-Band: 50 to 180 MHz; step 1 Hz
- SNR > 40 dB @ 0 dBm -16 APSK – 30 Mbaud
- Shoulders rejection < -45dB @ f/fn = 2
- Spurious: < -65 dBc @ 0 dBm in-band / -60 dBc out-of-band
- Main RF output, type N, L-Band: 50Ω / IF-Band: 75Ω
 - AC: +5 dBm to -30 dBm, step 0.1 dB
 - L Band DC (BUC Driver): +10 dBm to -40 dBm, step 0.1 dB
- Monitoring RF output, type SMA, 50Ω
 - AC: -15 dBm to -50 dBm, step 0.1 dB
 - L Band DC (BUC Driver): -10 dBm to -60 dBm, step 0.1 dB

BM6500 Orion Satellite L-Band or IF-Band Modulator

Applications

The Telairity BM6500 Orion modulator offers a cost-effective and flexible solution for generating high-quality L-Band satellite signals in either a stand-alone 1RU unit or integrated into Telairity 1RU encoders. It is the most integrated and cost-effective solution for all DSNG and DVB-S/S2 satellite modulator applications, including:

- Satellite contribution
- DSNG applications
- Satellite distribution
- Direct to Home (DTH) applications
- LOS/NLOS digital data transmission
- Test systems

Benefits

Available as a compact 1RU system or embedded in any 1RU Telairity encoder

Output frequency range: L- or IF-Band.

L-Band stand-alone 1RU system has option for both DC voltage (BUC power supply) & 10 MHz reference signal

Full compliance with DVB-S, DVB-DSNG and DVB-S2 standards; carrier ID compliant via ETSI 103 129 for transponder signal identification without signal decoding

Either ASI or MPEG over IP inputs (SMPTE-2022) up to 200 Mbps

Opportunistic data insertion (replacing null stuffing packets) for free Push Data services with MPE-compliant receivers

BISS 0/1/E encryption

Boot time under 14s

Variable system rates from 0.1 to 68 Mbaud with 1 baud increments, to support transponder applications from 0.15MHz for ENG to 72 MHz for teleport

Low roll-off (5/10/15%) to increase useful bitrate, maximize bandwidth efficiency

High performance under 30W with high Signal-to-Noise (SNR) ratio, excellent shoulder levels and low phase noise

Physical Layer Scrambling according to the EN 302 307 standard

Internal PRBS generator for test

Control & monitoring via embedded Web Browser or SNMP

Ordering Information

Part Numbers:

1RU Stand-alone Unit (BMs series)

BM6501 Orion L-Band (950-2150 MHz)

BM6502 Orion L-Band with BUC Driver

BM6571 Orion IF-Band (50-180 MHz)

Integrated into 1RU encoder (Bmi series)

Bmi6501 Orion L-Band (950-2150 MHz)

Bmi6571 Orion IF-Band (50-180 MHz)

Also available as Orion BM6600 with DVB-T/T2 Modulator

Contents with 1RU Stand-alone Unit

- BM6000-series Modulator
- Power Cable: IEC to USA plug; optional Euro plug
- USB flash drive with backup copy of modulator firmware and manual

Requirements

- ASI or IP input
- Cables (input/output)
 - 75 Ohm coaxial with BNC connector for ASI
 - Cat5/6 Ethernet with RJ-45 connector for IP
 - RF out & monitor cables

About Telairity

Telairity, based in Santa Clara, California designs, manufactures and markets H.264/AVC and other advanced encoding and transcoding solutions for broadcast and professional video applications. Telairity's breakthrough video architecture (Telairity-1™) is the foundation for all its real time encoding products, which combine outstanding video quality with state-of-the-art, video compression based on the AVC (H.264 / MPEG-4.10) standard to achieve the lowest possible bitrates.

Telairity

3375 Scott Blvd., Suite 300
 Santa Clara, CA 95054
 tel 408 764 0270
 fax 408 764 0271
 www.telairity.com

BUC Driver: DC & 10MHz in L-Band Signal (BM6502 1RU stand-alone unit only)

- DC: maximum power 50W – soft-selectable voltage: 12V/4A / 24V/2A / 48V/1A
- 10 MHz Very High Stability frequency: +/- 0.01 ppm over 0 to 70° C
 - Aging: +/- 15 ppb / day, +/- 300 ppb / year

Clock & Synchronization

- High Performance Internal Oscillator
 - Stability: +/- 2.5 ppm over 0 to 70° C; Aging: +/- 0.8 ppm / day, +/- 10 ppm / year
- External 10 MHz input for RF synchronization

Opportunistic Push Data Service insertion

- Replace stuffing packets with packets of arbitrary content for free push data services using the same audio/video bandwidth
 - Upgrade PSI/SI tables
 - Deliver data or secondary audio/image/video files with sizes up to 100 Mbytes

Modulation

- DVB-S / DSNG
 - Outer / Inner FEC: Reed Solomon / Viterbi
 - QPSK: 1/2, 2/3, 3/4, 5/6, 7/8
 - 8PSK: 2/3, 5/6, 8/9
 - 16QAM: 3/4, 7/8
 - Roll-off value: 0.35
- DVB-S2
 - Outer / Inner FEC: BCH / LDPC
 - QPSK: 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
 - 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
 - 16APSK: 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
 - 32APSK: 3/4, 4/5, 5/6, 8/9, 9/10
 - PL Scrambling codes [0, 2641453]
 - Supported DVB modes:
 - CCM: Constant Coding and Modulation
 - VCM: Variable Coding and Modulation
 - Seamless ACM: Adaptive Coding and Modulation
 - DVB-S2 Short frames: 16 200; Normal frames: 64 800
 - Roll-off values: 0.05, 0.10, 0.15, 0.20, 0.25, 0.35
 - Pilots ON or OFF
 - Variable symbol rate from 0.1 to 68 Mbaud, step 1 Baud

Control & Monitoring

- 1 x 10/100/1000 Base-T Ethernet port
- RS-232 control port with ASCII protocol
- SNMP and Web Browser Control & Monitoring
- Keyboard and display on the front panel
- Alarm relays – connector 9-pin sub-D female

System (1RU unit)

- Power supply: 90 to 240VAC – 50 / 60 Hz – 30W (without BUC)
- Dimensions: 1RU [44mm/1.75in] (H) x 450mm/17.7in (L) x 350mm/13.8in (W)
- Weight: 4 Kg / 8.8 lbs
- Temperature: 0° C to 50° C



BM6500 Back Panel

Copyright 2016 by Telairity. All rights reserved. All products mentioned here are the trademarks or registered trademarks of their respective owners. Telairity reserves the right to make changes without notice and does not assume any liability arising from the application of this product.