



## AMT75E DVB-S/S2 SCPC Satellite Modem

**AMT75E by SpaceBridge is a multi-purpose High Speed Satellite modem which is a particularly versatile and effective solution for any broadcast environment. The emergence of HD and 3D content demands more data and the AMT75E handles all higher DVB-S2 modulation schemes.**

The AMT75E achieves a Bandwidth-efficient transmission, from 30% to 150% gain when compared to the old DVB-S performance. When compared with the old FEC coding, the LDPC (Low Density Parity Check) and BCH (Bose-Chaudhuri-Hocquenghem) coding is known to be far more robust, giving a performance as close as 0.7 dB from the famous Shannon limit. In practice, this means your capital investment is significantly reduced due to the decreased bandwidth requirements.

The AMT75E modem is also designed using Software Defined Radio techniques to ensure unrivaled flexibility: Any future technology evolution or new features can be introduced by simple FW upgrade. A future-safe investment is hereby guaranteed.

When used for broadcast applications, the AMT75E offers a flexible choice of data interfaces. These are up to 8 (4 are standard) ASI inputs which can be aggregated into a DVB-S2 single MultiStream carrier (CCM/VCM/ACM). Next to these, an GbE IP interface is also available with optional MPE and GSE encapsulation. Going beyond the standardized DVB-S2 specifications, SpaceBridge also offers extra improvements for even greater BW efficiency, such as a roll-off factor of 5%, 64QAM modulation, 4k block size (yielding even lower latency), and eTPC Turbo code for lower speed applications. (Telco use mainly)

Obviously, the unit is also backward compatible with older modulation schemes such as DVB-S and DVB-DSNG. The demodulator part is quasi 100% the mirror of the modulator part: It is performing ISI filtering for DVB-S2 MultiStream applications, Decapsulating the IP stream(s), and handling all standardized modulations.

### Features

- Combines powerful DVB-S/S2 modulator and demodulator in a single 1 RU chassis.
- Powerful Forward Error Correction (FEC) choices compliant with DVB-S, DVB-DSNG, and DVB-S2.
- The DVB-S2 implementation includes 16APSK/32APSK and both 16k (SHORT) and 64k (NORMAL) FEC Block sizes 64QAM support is backed with powerful LDPC BCH implementation (4th generation turbocode) to provide 155Mbps high efficiency link.
- Also supports eTPC Turbo code for lower speed applications (up to 20Mbps).
- Supports standard Viterbi and Reed Solomon.
- Symbol Rates from 32ksps to 45Msps Symmetrical or asymmetrical support.
- Modulation and FEC options are all “soft key” controlled allowing simple field upgrades
- Excellent spurious performance
- L Band: 950 to 1750 MHz IF ranges, or 950 to 2150 MHz IF ranges and/or 70+/-18MHz or 140+/-36MHz IF ranges
- Wide range of Network Interface Cards (NIC):
  - EIA530/RS422
  - HSSI and multi-HSSI interfaces
  - 10/100Mbps Ethernet (IP routing or bridging support)
  - G.703 interfaces
  - Multi G703 interfaces
  - 1GigE L2 and bridging
  - STM1e support
  - 1:1 and 1:10 redundancy switches available.
  - Monitoring and control via Ethernet using Web Server, HTTP, Telnet or SNMP, or via terminal mode RS232.



## Applications

Although being designed as a universal Modem, this unit is particularly suited for the following application fields:

- Digital Video distribution Broadcast
- Digital Satellite News Gathering
- Corporate (bi-directional) networks
- Contribution broadcast networks video exchange
- IP traffic to ISP's
- IP backbones and cable restoration
- Primary Distribution of terrestrial networks

## Performance Specifications

### Data and code rates

- DVB-S and Intelsat 308/309 coding:
- BPSK: 16kbps to 36Mbps
- QPSK: 16kbps to 70Mbps
- DVB-DSNG coding:
- QPSK: 64kbps to 70Mbps
- OQPSK: 64kbps to 70Mbps
- 8PSK: 128kbps to 110Mbps
- 16QAM: 128kbps to 120Mbps
- DVB-S2 short and normal FEC block coding:
- QPSK : 64kbps to 80Mbps
- 8PSK: 256kbps to 120Mbps
- 16APSK: 340kbps to 160Mbps
- 32APSK: 470kbps to 200Mbps
- 64QAM: 640kbps to 155Mbps
- SHORT Block 16kbit:  $\frac{1}{4}^*$ ,  $\frac{1}{3}^*$ ,  $\frac{2}{5}^*$ ,  $\frac{1}{2}^*$ ,  $\frac{3}{5}$ ,  $\frac{2}{3}$ ,  $\frac{3}{4}$ ,  $\frac{4}{5}$ ,  $\frac{5}{6}$ ,  $\frac{8}{9}$
- NORMAL Block 64kbit:  $\frac{1}{4}^*$ ,  $\frac{1}{3}^*$ ,  $\frac{2}{5}^*$ ,  $\frac{1}{2}^*$ ,  $\frac{3}{5}$ ,  $\frac{2}{3}$ ,  $\frac{3}{4}$ ,  $\frac{4}{5}$ ,  $\frac{5}{6}$ ,  $\frac{8}{9}$ ,  $\frac{9}{10}$

\* Only available in QPSK according to the DVB-S2 Specification

## FR Frequencies

- L-band output (modulator): 950 to 2150MHz in 100 Hz steps
- Optional: 2nd output @ 70+/-18MHz or 140+/-36MHz in 1 Hz step
- RF Output Power:
  - Range: +0 to -25 dBm, in 0.10 dB steps
  - Accuracy: +0.5 dB; Temp
  - Stability: +0.25 dB
  - Spurious Outputs <-65 dBc/4KHz@ 0dBm
- RF Input Power Levels:(Demodulator)
  - Nominal: 45 dBm -  $10\log(400/R)$  dBm, where R = Symbol Rate in kSymbols
  - AGC range: +/-20dB minimum
  - Max level: 0dBm
- BUC Reference Frequency and Stability: Frequency: 10MHz, 0 dBm, +2 dB
- Stability:  $1 \times 10^{-9}$ /per day; +/-150 x  $10^{-9}$  long term, no frequency / phase hits for external ref.
  - BUC 10 MHz Reference Frequency Phase Noise
  - 115 dBc/Hz maximum @ 10 Hz
  - 135 dBc/Hz maximum @ 100 Hz
  - 148 dBc/Hz maximum @ 1 kHz
  - 150 dBc/Hz maximum @ 10 kHz
  - 160 dBc/Hz maximum @ 100 kHz

## LNB Power and Control

- Selectable LNB Supply Voltage: ON/OFF, 18VDC (Horizontal Pol.) or 13 VDC (Vert Pol.)
- LNB Control: 22 ±4 kHz single tone burst, amplitude =0.6 ±0.2 V p-p

## Typical Eb/No Performance (margin with regards to DVB ideal requirements)

	DVB-S	DVB-DSNG	DVB-S2
QPSK	<0.5dB	<0.5dB	<0.5dB
BPSK		<0.7dB	<0.7dB
16APSK			<1.0dB
32APSK			<1.5dB

## Data Interfaces

- ASI interfaces: (4 or 8 inp/out:option)
- BNC(F), 75 Ohms for ASI
- Encoded Line Rate: 270 Mbps±100 ppm
- Sensitivity (D21.5 idle pattern): 200 mV
- Max. Input Voltage: 880 mVp-p
- Min. Connector Return Loss: 15 dB
- Max. Distance: 150 Meters
- Support of Base Band Frames
- Scrambling modes:
  - BISS scrambler modes 0, 1 & E + pseudo BISS scrambling for full transparency (option)
  - Physical Layer Scrambling (modulation scrambling)
- E3 interface
- IP GbE Interface and MPE or GSE encapsulator
- Roll off factor (Nyquist filter): 0.05, 0.10, 0.12, 0.15, 0.20, 0.25, 0.30, 0.35 with 0.01 step

## RF Inputs/Outputs

- IF Output Connector: (Modulator)
- Type (N) 50 Ohm for L-band
- BNC (F) for 70/140Mhz, 50 Ohm (option)
- Return Loss 20dB
- IF Input Connector: (Demodulator)
- F-Type (F) 75 Ohm for L-band
- BNC (F) for 70/140Mhz. 50 Ohm (option)
- Return loss: 10 dB
- LNB Alarm for Short Circuit

## IP options

- Static and Dynamic IP routing (RIPv1&2)
- OSPF
- DHCP Server
- Network Address Translation
- Packet Filtering (Firewall)
- Quality of Service support to Level 3
- Command line interface (Industry Standard)
- SNMP v.1 & v.3, MIB II
- AAA (Authentication, Authorization & Accounting)
- Local AAA (Access Rights Table)
- PAP, CHAP, MS-CHAP (Client/Server Authentication)
- RADIUS, TACACS+ (Client, Remote server authentication)
- Ping, Traceroute, Discovery Protocol
- IP, TCP, UDP, ICMP Protocol Statistics
- Interface Statistics
- IPSec (up to 256bit AES)
- VRRP

## Operational Interfaces

- **IPE-422:** Provides 2ASI In and 2ASI Out multiplexing ports and quad 100/1000BaseT IP Encapsulator/forwarder supporting up to 200,000 packets per second (pps). The card can be used as a multi-service media router (combining ASI video streams) and IP streams or may be used as an IP Encapsulator only. In Ethernet mode, the AMT75E can provide L2 forwarding and/or use bridge protocols, such as RSTP, to build local and remote forwarding MAC tables. The IPE-422 also supports VLAN and even jumbo frames.
- **Multi-IO Gateway:** 10/100Mbps Ethernet (IP router/Bridge) + EIA530/RS422 and HSSI: A powerful interface supporting serial ports and an IP router/bridge.

## Optional TELCO application interfaces

- **TG-810/TG-410 (Telecomm Gateway):** Available in either Quad G703 or Octal G703 options with 10/100BaseT Ethernet (IP Gateway). The versatility and capabilities provided by the interfaces make the TG ideal for applications such as Cellular backhaul, point-to-point and point-to-multipoint transmission for voice, video and data services. This interface allows for the deployment of single or fractional G.703 interfaces (up to 8 x G.703 interfaces) and IP together over a low overhead optimized framing format (Advanced Packet Over Carrier APOC)
- **STM1e:** Provides a single STM1e interface providing supporting for the 155.52Mbps TDM data rate and format. STM1e is available on AMT75E modems supporting 32APSK or 64QAM.
- **Multi-IO Interface:** Support for 10/100BaseT IP router/bridge and standard serial EIA- 530/RS422 and HSSI support. Can either be transported transparently or can interface and interoperate with Frame Relay or HDLC.
- **HSSI and Triple-HSSI interface:** High-Speed Serial Interface (HSSI) is a serial interface that supporting transmission rates up to 52 Mbps. It is traditionally used to connect routers on local area networks over VSAT or over wide area networks (WAN).