

Features

- Combines Advantech Wireless' 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 45Mpsps 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

Overview

Advantech Wireless' AMT 75e 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 AMT 75e handles all higher DVB-S2 modulation schemes.

The AMT 75e 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 AMT-75 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 AMT75 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, a GbE IP interface is also available with optional MPE and GSE encapsulation. Going beyond the standardized DVB-S2 specifications, Advantech also offers extra improvements for even greater BW efficiency, such as a roll-off factor of 15%, 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.

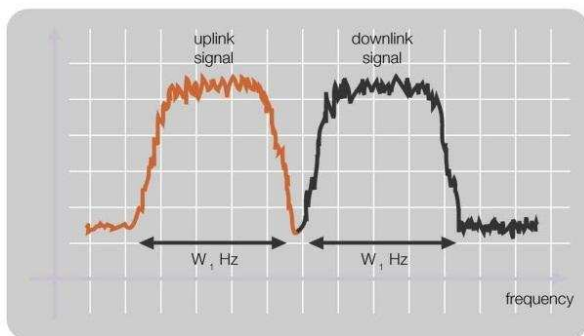
Overview (Cont'd)

When used in a redundant configuration, the unit has a built-in detection and triggering system, requiring external switches only, rather than a complete external redundancy system. This offers the flexibility of being totally independent of the redundancy configuration, which can be varying from 1+1 to e.g. 10+1.

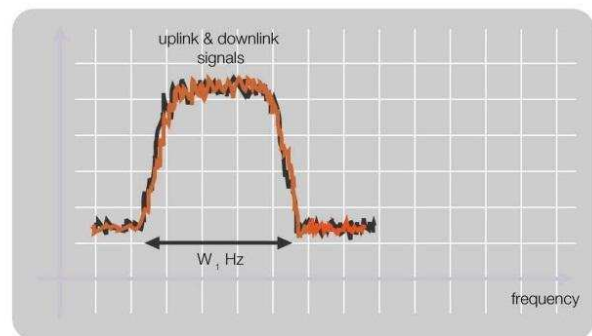
Last but not least, this design has been proven to be one of the most reliable products on the market, while the unit price is very comparable with the DVB-S2 gain described above. More details can be found on our Modulator (SBM75e) and Demodulator data sheets (SBD75e).

The AMT75e modem can also be supplied with the ViaSat patented PCMA technology (may be external). This embedded unit boosts the capacity of your satellite transponder space by combining the uplink and downlink transmissions into the same bandwidth. While most satellite transmissions require separate frequencies to transmit and receive, this device enables two different signals to overlap in frequency, which decreases the space segment requirements for your network. The embedded feature uses an adaptive self-interference cancellation technique to subtract your transmitted signal to recover the desired signal. The canceller works with all modulation and FEC techniques on “bent pipe”, non-cross-strapped satellite networks to enhance the benefits of any advanced modulation techniques or turbo coding you may already use.

Overlap Transmit & Receive Channels for Bandwidth Savings



Typical satellite transmission with separate frequencies for uplink and downlink



Channels overlapped by VPCMA-70 to increase bandwidth capacity and cut bandwidth needs

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
 - Roll off factor (Nyquist filter): 0.15, 0.20, 0.25, 0.30, 0.35

RF Inputs/Outputs:

- IF Output Connector: (Modulator)
- Type (N) 50 Ohm for L-band
- BNC (F) for 70/140Mhz, 50 Ohm (option)
- Return Loss 12dB
- 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

RF 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
- RF Input Power Levels:(Demodulator)
 - Nominal: 45 dBm - 10log(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 x 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
8PSK		<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 MPEor GSE encapsulator:
- **Optional 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 AMT75 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.

- **Optional interfaces for TELCO applications in particular:**
 - **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 AMT75 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).

Interface options:

- Multi-IO Gateway: 10/100Mbps Ethernet (IP router/Bridge) + EIA530/RS422 and HSSI: A powerful interface supporting serial ports and an IP router/bridge.

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, Authorisation & 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

AMT 75e DVB-S/S2 High Speed Broadcast Modem



PCMA WAVEFORM AND PERFORMANCE SPECIFICATION

Compatibility	Modem and waveform agnostic; Standard modulation types (BPSK, QPSK, 8-PSK, 16-ary, 32APSK, QAM, etc.); Coding-independent (works with Viterbi, Reed-Solomon, LDPC, Turbo, etc.)
Frequency Range	L band (950 to 2150 MHz)
Frequency Tunability	1 kHz steps
Signal Bandwidth	2, 5, 10, 15, 20, 36, 54, 72 MHz
Acquisition Time	< 1 Minute
Self-interference Suppression	At least 25 dB
Phase Noise Added	< 2.5 degree RMS integrated to 54 MHz

CHANNEL CONDITIONS SUPPORTED

Frequency Error	up to ± 100 kHz
Channel Gain Change Rate	up to 1 dB per second
Round trip propagation time	User selectable from 0 to 300 msec
Adjacent Carrier Interference	Suppression performance does not degrade in presence of adjacent channels
Non-linear transponder operation	May be operated in the non-linear region of transponder

Physical and Power Specifications:

Dimensions: 1RU standalone chassis, 19W X 15.75D X 1.75H inches (48W X 40D X 4.4H cm)

Weight: 8lbs (3.7kgs)

Power: 85 to 265VAC (50/60Hz) or -48VDC (32 to 72VDC).

Power consumption: 50Watts (no BUC power supply)

Optional: BUC Power Supply 24VDC@4A, 48VDC@2A, 48VDC@4A

Operating temp: 0°C to 50°C (32°F to 122°F)

Storage temp: -25°C to 85°C (-13°F to 185°F)

Relative humidity: Operating: Up to 90% non-condensing

Non-Operating: Up to 95% non-condensing

Altitude: Operating: up to 10,000' (3,045M)

During Transit: up to 40,000' (12,180M)

Advantech Redundancy Modules:(Optional)

- ARM-71x: 1:1 redundancy for EIA530 or HSSI and IF.
- ARM-72x: 1:1 redundancy supporting 8 G703 and IP & IF
- ARM-81x: 1:10 redundancy for EI530 or HSSI.
- ARM-82x: 1:4 redundancy for octal G703/IP.

Related Advantech Wireless Products

SBD 75e: Broadcast DVB MultiStream Demodulator

SBM 75e: Broadcast DVB MultiStream Modulator

IPe422: IP Encapsulator - Multiplexer

ARUD-xxx: Block and Agile Frequency Converters (C-, Ku,X, etc)

ER-9160 High performance IP router

IRDR: Integrated Receiver Decapsulator - Router

A complete list of SSPA with integrated BUC covering all frequency bands and output power demands.

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