Next Generation
VSAT hubs and terminals

Increasing performance and bandwidth utilization
Discovery Hubs and A-SAT-II™ - Bandwidth Optimized Satellite System Technology

Efficient bandwidth utilization is key for the success of any satellite system. Well ahead of any solution available in the market, Advantech Wireless has developed a revolutionary technology for use on our VSAT Discovery Hubs product line-up based on Adaptive Satellite Access Technology 2nd Generation (A-SAT-II™).

Maximizing satellite bandwidth efficiency

Our new A-SAT-II™ technology is even more efficient than our industry leading A-SAT™ technology which, monitors channel utilization and dynamically switches the satellite access method and MODCOD seamlessly for the return channel. This new technology maximizes the space segment utilization efficiency by supporting another Advantech Wireless patented waveform* called BM-FDMA (Burst Mode – Frequency Division Multiple Access). This waveform is ideal for supporting real-time applications such 3G/4G LTE cellular backhauling without sacrificing on the statistical sharing by dynamic assignment of a dedicated carrier dictated by the application.

A-SAT-II™ combines 3 different waveforms to optimize the spectral efficiency (Bits/second/Hz). Based on the traffic or application being transmitted in the network, the waveforms are seamlessly changed between MF-TDMA, BM-FDMA and CM-SCPC (Continuous Mode Single Channel per Carrier). No longer does a network operator or service provider need to be concerned about the traffic to be carried in the network. The traffic is constantly monitored and switched dynamically to the optimal access scheme and thereby minimizes the satellite bandwidth costs.

The most scalable & most advanced in the market. Pay for capacity & capability only as your network grows.


<table>
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<tr>
<th>Product</th>
<th>Maximum Forward Link Mbps</th>
<th>Maximum Return Link Capacity Mbps</th>
<th>RL Maximum Number of Carriers</th>
<th># Terminals Supported</th>
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</thead>
<tbody>
<tr>
<td>Discovery 100</td>
<td>200</td>
<td>48</td>
<td>96</td>
<td>up to 500</td>
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<tr>
<td>Discovery 200</td>
<td>n x 200</td>
<td>144 (3x48)</td>
<td>288</td>
<td>up to 1,500</td>
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<tr>
<td>Discovery 300</td>
<td>n x 200</td>
<td>240 (5x48)</td>
<td>480</td>
<td>up to 5,000</td>
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<tr>
<td>Raptor</td>
<td>200</td>
<td>48</td>
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World’s most Advanced MF-TDMA MCD (Multi-Carrier Demodulator)

The Advanced Multi-Carrier Demodulator (MCD) from Advantech Wireless is a state of the art demodulator for MF-TDMA and BM-FDMA oriented networks. It has a flexible architecture which can be configured to support up to 96 return link MF-TDMA or BM-FDMA carriers, on a single card. Each carrier can be configured to be a different symbol rate, MODCOD, encapsulation and up to 48Mbps aggregate throughput on a single card. This unique demodulator enables terminal CAPEX to be minimized compared to the competition. The MCD covers 36 Mhz in a 1U appliance saving telco’s rack space and enabling real statistical multiplexing sharing factor over the all operator continuous bandwidth.

CAPEX saving example

Let’s consider a Ku-Band TDMA network return link requirement of 8 Mbps. Using a single TDMA carrier demodulator would require all the remote terminals to be able to transmit at 8 Mbps even though their individual data throughput requirement may be 256 Kbps. Advantech Wireless can achieve the same network throughput using 32 MF-TDMA carriers at 256 Kbps. Therefore, at the Hub a single MCD card can be used instead of 32 demodulators or modem cards. At the remote sites instead of using a 2.4m, 8W remote terminal Advantech Wireless is able to provide the same network capacity using 1.2m, 1W remote terminals.

The potential CAPEX savings for the remote terminals are huge and can enable network opportunities that have been considered too costly until now. In this example the CAPEX savings alone could exceed $3500/terminal. Assuming a 100 terminal network this equates to a saving of $350,000.
Extended capacity, capability & efficiency at Minimal cost

The Advantech Wireless Millennium II high capacity VSAT hub was purposefully developed to meet the needs of very large VSAT networks typically operating on High Throughput Satellites (HTS). The Millennium II modular design is easily expanded as network size increases. It is ideally suited for Network Operators and Service Providers. Scalability allows CAPEX expenditures to match network growth. Virtual Network Operator (VNO) capability allows support of numerous virtual operators. VPN capability provides secure communications for sensitive information transfers.

A single rack can be configured to support upwards of 45,000 remote terminals and can support 17.5 Gbps of traffic to the remotes, spread across up to 5 different beams and 5 DVB-S2X carriers. This single rack can also receive up to 720 Mbps of IP traffic generated by the remote terminal population in the DVB-RCS mode.

The Millennium II Hub is designed to operate with satellites on any frequency band (Ku, Ka, X, C-Band) and will support all of Advantech Wireless family of Remote Routers (terminals), known as STIs (Satellite Interactive Terminals) including the latest Series 7000 and 8000 families of VSAT Routers. Star, star/mesh hybrid MF-TDMA, BM-FDMA, A-SAT-II and high-capacity SCPC are all supported in the Millennium II Hubs.

Millennium II - High capacity VSAT Hub for HTS

Millennium II Configuration Example

2 x 5 x 3.5 Gbps forward link (FL) for a total of up to 35 Gbps
- Each FL (total 10+2) can be on a different beam or satellite
- 1:5 redundancy within a rack

5 x 6 x 48 Mbps return links (RL) for a total of 1.4 Gbps
- Up to 2400 simultaneous RL MF - TDMA DVB-RCS2 Carriers
- Each RL MCD (total 30) can be on a different beam or satellite
- 1:5 redundancy within 2 racks
- 6 RL Blocks

Total of 100,000 terminals supported
VSAT Terminals (TDMA and SCPC)

New Series 7000 Family of VSAT Routers

The Series 7000 family of VSAT routers is the latest addition to Advantech Wireless’ extensive line of VSAT products. Building on the heritage of the 4000, 5000 and 6000 Series of modems, this family of products includes multiple models targeted for specific satellite architectures, access schemes or applications. These routers can operate with continuous throughputs of up to 200 Mbps on the Forward Link and on Return Link rates up to 25 Msymbol/s. Models in this family support Advantech Wireless’s revolutionary A-SAT-II™ technology giving rise to the ultimate satellite bandwidth efficiency and packet per second support up to 100,000 packets per second.

VSAT Terminals

Advantech Wireless’ has the most comprehensive line of VSAT terminals supporting outdoor weather-proof cellular backhauling, A-SAT-II™ support, mobility, SCADA, homeland security, PoS and many other unique applications.

All Advantech Wireless’ MF-TDMA, SCPC BM-FDMA and A-SAT-II™ terminals come with embedded QoS/DSCP, TCP Acceleration and VLAN Tagging / Pass through, BoD features, as well as optimized support for real-time applications such as VoIP and video conferencing. Option exists to incorporate encryption (IPSec).

Sample Modems

New Ka-8000 / Ku-8000 Series

Ka/Ku-Band Outdoor VSAT Routers (Terminals)

- Industry First entirely integrated Ka-Band or Ku-Band Outdoor VSAT Terminal
- Consists of modem, Ka or Ku-Band transmitter, receiver and antenna system
- Flexible waveforms and symbol rates
- DVB-S2/ACM, DVB-S2X, DVB-RCS2, BM-FDMA and CM-SCPC compliant
- Ultra wide band forward channel - 500MHz, up to 3.5 Gbps
- 1.5 and 3 Watt (Ka), 2W and 4W (Ku) transmit output power options
- Covers 1 GHz of RF bandwidth, transmit and receive
- Power over Ethernet (POE)
- 100/1000BT Ethernet interface
- Audio antenna pointing aid for DIY installation
Advantech Wireless InterSKY™ product family

Advantech Wireless InterSKY™ HTR

Advantech Wireless new BM-FDMA (BM-SCPC) return link technology, InterSKY™ HT offers the most efficient utilization of bandwidth, with a significant reduction in the total cost of ownership. InterSKY HT™ is designed to support multiple Return Link access schemes DVB RCS1, RCS2, SCPC and BM FDMA all under one robust platform.

The InterSKY™ HTR [High Throughput Receiver] offers up to 1200 channels for a combined 36MHz HUB RLS (Return Link System) support equipped with unmatched demodulator technology and enhanced link reliability in harsh weather conditions combined with ACM.

Advantech Wireless’ InterSKY™ HTR supports a wide coding and modulation range (QPSK, 8PSK, 16APSK and 32APSK) with advanced LDPC forward error correction (FEC) and variable block sizes from 848 bits to 16 Kbits.

InterSKY Commercial VSAT Modems

**BSR/BSR-V** – Broadband satellite router compact VSAT that is scalable in both performance and capability; available in IP and IP + voice models with two embedded FXS voice ports using unique BM FDMA RLS access scheme.

**BSR Pro / BSR Pro - V** - High-performance remote gateway broadband satellite router, enabling coverage of both low and high-end application requirements in fixed, transportable and communications on-the-move (COTM) deployments using unique BM FDMA RLS access scheme. Additional integrated 2 PORT FXS voice support for VOIP ATA integrated solution within the Modem.

Military Satellite Routers

**MSR Pro** - Professional 19” rack mount military satellite router suitable for static and deployable arenas.

**MSR / MSR-R** - Advanced rugged military satellite routers designed for military applications, available in transportable, man-portable and on-the-move (COTM) models supporting, spread spectrum, integrated VoIP, Video Compression and Data Encryption and Transec capability.
Advantech Wireless’ high throughput, highly reliable and flexible family of SCPC continuously variable symbol rate modems features a variety of redundant and non-redundant configurations designed to meet the needs for the enterprise, broadcast markets and governments.

SCPC Broadcast Modulators & Modems

Broadcast Modems AMT – 75 Series
The AMT – 75 Series which encompasses ASI HD Video, Telco and IP interfaces in the same platform.

AMT – 75e DVB-S/S2 Modem
Combines SBM75e & SBD75e in one unit. Best Value for price in market. Proven reliability.

SBM75e Modulator 64Kbps to 200 Mbps
Aggregates up to 8 MPEG-TS (ASI) inputs. IP HDLC, MPE or GSE encapsulation, routing, bridging.

New Satellite 500MBPS Modulator SBM75X, high data rate, for Broadcast Applications.
Fully compliant with the new DVB-S2X standard. With symbol rates up to 150 Mbps, and low Roll-Off Factor of 5%, it can cover up to 175 MHz transponder with maximum bandwidth efficiency.

SBD75e Demodulator
Provides up to 6 ASI outputs. Decapsulates MPE IP streams up to 512 PIDs. Single and dual demodulators options available.

Enterprise SCPC Modems
AMT – 30 Series (previously known as QD2048)
16kbps to 10 Mbps in 1 bps Steps. L-Band or 70 MHz Interfaces. BPSK, QPSK, 8PSK & 16QAM Operation. Bridging and/or IP Routing (standard). FEC: Viterbi-RS, TPC, eTPC, TCC. Multi-demod configurations, 4 to 16 L-Band Channels in a single enclosure.

Configurations
- TX-only Modulator only
- Rx-only Dual Demodulator only
- Tx-Rx Mod/Demod
- Tx-Rx Mod/Dual-demod
- 4Rx- AMT34 (QD2048) Quad-demod
- 16Rx 16 channel Demod

VR7400
- New powerful low cost IP modem supported DVB-S2 Tx and Rx.
- Fully compliant with DVB-S2 standard
- Support CCM/VCM/ACM operation
- ASI and IP interfaces
- Tx up to 25Msym/s in DVB-S2
- Ideal for DSNG trucks

Military Modems
AMT – 73 L
MIL-STD-188-165A not only COMPLIANT but also DISA CERTIFIED.
Data Rates 64kbps – 52Mbps in 1bps steps.
Optional eTPC Rates from 0.5 to 0.92. eTPC Extends data rate to 110Mbps.
BPSK, QPSK, OQPSK, 8PSK & 16QAM.

Modem Data Protection Switch M:N, 1:1, 2:1 Redundant
Unique combination of 8 E1/T1 G.703 Telco and 1xIP Gateway data interface per modem. Flexible variety of redundant configurations. Redundant power supplies. Modular design for maximum flexibility. Hot swap capabilities for all modules. Flexible monitoring and control. Front panel display of status and control functions. Comprehensive set of interfaces:
- 8E1/T1 G.703 + IP, RS-530, HSSI
- Support IF/L Band Switching

1:1 redundancy controller

10:1 redundancy controller

Antennas - Autodeploy & Flyaway
Pictured is a 1.2m High Gain Dual Optic Reflector, SMC or optional Carbon Fiber. Compact and Robust. Acquires in < 2 minutes. Integrated with Ultra-Compact 50W Ku-band GaN based BUC and A-SAT-II™ Modem.
Advantech Wireless manufactures solid state, embedded, efficient and reliable solutions for IP networking. They implement a variety of standard communication protocols and are easily integrated into existing networks.

**Forward Link Subsystem FLS-100 / FLS150**

Key FLS 100 functions include:

- IP Encapsulator (IPE), MPE and GSE (IPE-422)
- DVB MPEG-TS Multiplexer
- DVB-S2 Modulator

Additionally FLS150A has the following added features:

- ACM Controller
- 10 MHz reference
- Power feed to LNB

**IP Encapsulator-Multiplexer (IPE-422 IP)**

MPEG2-TS with MPE DSM-CC.

DVB-MPE or GSE Encapsulation. 4x 10/100/1000 Base-T. ASI Input + 2x ASI Outputs. Encapsulation of forward IP traffic up to 80,000 packets/sec. Transport stream data rate up to 200Mbps.


**Performance Enhancing Proxy (PEP)**

Improves TCP performance over Satellite, Establishes TCP connections up to 500/sec (PEP100), 1000/sec (PEP200), 1500/sec (PEP300), does not modify the application protocol, totally transparent to the applications, maximum performance per single TCP connection, data and image compression and caching. Aware of network topology data throughput: 50Mbps (PEP 100), 100Mbps (PEP200), 200Mbps (PEP300).

**High Performance Router - R800**

High packet and data performance. Up to 200,000 packets per second (pps). Up to 3 Gbps data rate internal throughput. Full featured Layer 2 GigE Switch & Layer 3 GigE router. 7 GigE Ports. 3x10/100/1000BaseT Routed ports. 4x10/100/1000BaseT Switched ports. Broad set of services, including DHCP client and server, DNS client, NTP client, FTP/TFTP client, NAT, CDP, AAA RADIUS and more. Extensive control, monitoring and statistics via M&C Ethernet and serial Ports. GRE tagging and tunneling.

**High Stability GPS Time Reference**

The GPS-100P is a timing and frequency reference system designed for synchronization of satellite networks such as DVB-RCS, DVB-RCS2 or LTE cellular backhaul systems. This system provides a precision time and frequency reference to synchronize transmitters across multiple locations.
At Advantech Wireless we provide industry-leading innovations in advanced end-to-end satellite communication technologies. Our commitment is to help our customers achieve best performance and maximize ROI by providing complete customized turnkey solutions. We design, manufacture and deploy networking solutions for broadband connectivity, broadcast solutions and backhaul requirements using satellite and terrestrial wireless communications.