ASAT II™ System

Industry Leading Multiservice and Multi-Waveform VSAT Platform
Advantech Wireless ASAT II™ System and its unique 3D BoD™ and WaveSwitch™ technologies delivers best possible service, highest quality and most efficient bandwidth utilization.

Multi-Application Platform
- Consumer Internet
- SME and remote branch office connectivity
- Industrial IoT and M2M applications
- Enterprise networks
- Trunk and cellular backhaul
- Homeland security
- Mobile vehicular maritime and airborne applications
- Tactical military and defense applications
- SCADA
- Oil & gas
- Broadcast contribution and distribution

Features and Benefits
- 2nd generation ASAT™ System
- Extensible to support hundreds of thousands terminals.
- DVB-S2/S2X and RCS/RCS2 standards
- RCSX™ Return Link technology encompassing improved efficiency DVB-RCS / RCS2 MF-TDMA, ASCPC™ near-SCPC MF-TDMA and true SCPC – all in a single shared dynamic bandwidth pool
- ASAT II™ WaveSwitch™ 3D bandwidth-on-demand capacity assignment (SLA, demand and seamless waveform optimization) delivers optimum efficiency and network-utilization
- Embedded PEP and QoS
- True multi-service and multi-application operation
Future Proof
The ASAT II™ VSAT System developed to satisfy the most demanding operators’ needs. Built with flexibility and scalability in mind providing true multi-application service operation.

Flexible to Perfectly Meets Your Markets and Applications
Driven by demand for broadband consumer, Industrial IoT / M2M, enterprise, trunk and backhaul and mobile services for always higher throughputs with optimum efficiency, the Advantech Wireless ASAT II™ system was designed as a scalable multi-service platform configurable to support a few terminals to thousands. ASAT II™ support both GEO High-Throughput-Satellites (HTS) and wide-beam satellites.

Why Choose the ASAT II™ System
• Unlike single waveform platforms, ASAT II™ combines the power of 3 waveforms for maximum adaptation to dynamic application requirements
• ASAT II™ dynamically allocates BW from a single shared BW pool for highest efficiency. Platforms that partition waveform to separate pools suffer from reduced efficiency and require additional management efforts
• In contrast to other platforms providing one-dimension resource management only, ASAT II™ 3D BoD™ and WaveSwitch™ provide multi-dimensional on-demand capacity assignment (SLA, demand and seamless waveform optimization) delivering optimum efficiency and network-utilization

Performance to Rely On
Faster Forward and Return channels combined with unique 3D BoD™ and WaveSwitch™ adaptive access scheme technologies ensure all applications are served seamlessly.
• Higher Forward Link efficiency with DVB-S2X / S2 at 5% roll-off
• Wideband forward link for high-capacity satellite services
• Higher Return Link spectral efficiency with 8PSK and 16QAM
• Rich protocol support - ASAT II™ fully supports voice, multimedia and video-conferencing applications, and multicast services from both Forward Link and Return Links, including VSAT-to-VSAT. ASAT II™ provides fully integrated Protocol Enhancing Proxy (PEP), Quality of Service (QoS) optimizers and ACM to improve user experience, minimize satellite space segment and allow for true multi-service satellite operation

RCSX™ - Built on DVB-RCS, Expanded to Meet Real-Life Service Requirements
Based on interoperable DVB-RCS2 / RCS standards, ASAT II™ brings those extra capabilities providing best-of-breed MF-TDMA Return Link.
• Industry most responsive allocation mechanism
• Three waveforms seamlessly managed on shared bandwidth pool: DVB-RCS2 / RCS MF-TDMA, ASCPC™ near-SCPC long burst and true SCPC
3D BoD™ and WaveSwitch™- On-the-Fly Waveform and Access Method Switching Technology

Is your VSAT platform really efficient? As VSAT platforms support ever higher efficiency modulations-coding the industry is getting closer to reaching the absolute maximum efficiency - the Shannon Capacity Limit. On the other hand, network utilization seem to be lagging behind. Satellite service providers must make hard decisions between spectrum-efficient SCPC and high network utilization with bandwidth agility provided by MF-TDMA. Even platforms that offer additional waveforms require the selection of a single waveform at VSAT provisioning, forcing you to make a choice.

With the ASAT II™ System there is no need for providers to compromise. Traditional schedulers are able to take into account only user SLA profile and the terminal real-time demand. ASAT II™ 3D BoD™ is an intelligent multi-dimensional bandwidth on demand radio resource manager / scheduler automatically taking into account SLA, real-time terminal demand as well as terminal traffic density, to allocate optimum waveform and seamlessly switch terminals across three waveforms and access methods:

- DVB-RCS2 / RCS MF-TDMA – lean reservation based high network-utilization multi-frequency time-division multiple-access
- ASCPC™ - access scheme supports adaptive and longer transmission bursts, suitable for terminals of higher traffic density. ASCPC™ provides near-SCPC spectral efficiency, while minimizing jitter and greatly improves serialization delays inherent to MF-TDMA. These provide high Quality of Experience (QoE) to real-time and multimedia applications
- On-Demand SCPC – best spectral efficiency provided for those terminals of high and sustainable traffic density - while required

ASAT II™ 3D BoD™ and WaveSwitch™ manages terminals’ traffic across these three waveforms in real-time. WaveSwitch™ manages the entire Return Link as a single shared resource - eliminating any bandwidth fragmentation and utilization losses required to meet peak capacity demands.

WaveSwitch™ allows providers true bandwidth optimization matching best spectral efficiency, without sacrificing network utilization, delivering high service quality. ASAT II™ also eliminates the needs for extra hardware associated with bandwidth fragmentation.

How Efficient is Your Multi-Service Satellite Operation

More than ever providers need to manage a multi-service operation delivering consumer, premium, enterprise and trunk / backhaul services. ASAT II™ RCSX™ 3D BoD™ and WaveSwitch™ allows creating service differentiation by adding ASCPC™ and SCPC both dynamically triggered and scheduled up-front. Bundled with SigmaNMS™ management system allows for true multi-service operation managing all applications on the same platform, allowing operators to serve more Internet access users on the same bandwidth without sacrificing premium and professional services which immediately allocated their committed SLA, on demand. This reuse of space segment within a single shared bandwidth pool allows providers efficient high-utilization multi-service operations, resulting in increased customer base and operation revenues.

ASAT II™ VSAT Routers

The Compact Series
VSAT Routers and terminals for consumer Internet and IIoT / M2M mass markets.

Enterprise Series
Network appliance VSAT Routers to cover business connectivity needs.

Ultimate Series and Military-Grade
Multifunction Satellite Modems and VSAT Routers.
## System Specifications

### Scalability

<table>
<thead>
<tr>
<th>Spatial Topologies</th>
<th>Multi-gateway, multi-satellite / multi-beam support</th>
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<tbody>
<tr>
<td>Terminal Support</td>
<td>Up to 50,000 per FWD/RTN chain, multi-chain capability</td>
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</table>

### Forward Link

<table>
<thead>
<tr>
<th>Technology</th>
<th>DVB TDM Forward Link</th>
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<tbody>
<tr>
<td>Channel Rate</td>
<td>Up to 500Mps carrier per cluster</td>
</tr>
<tr>
<td>Waveform</td>
<td>DVB-52X ACM, VCM or CCM, GSE encapsulation, QPSK up to 256APSK LDPC/BCH</td>
</tr>
<tr>
<td></td>
<td>DVB-52 ACM, VCM or CCM, MPEG encapsulation, QPSK up to 32APSK LDPC/BCH</td>
</tr>
<tr>
<td>Channel Spacing</td>
<td>35% down to 5%</td>
</tr>
<tr>
<td>Forward Link Capacity</td>
<td>Up to 2.5Gbps per carrier</td>
</tr>
<tr>
<td>Hub IFL Output</td>
<td>Frequency independent - 950 – 2150MHz</td>
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<tr>
<td></td>
<td>Up to 2450MHz option, C-band IFL option</td>
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</table>

### Return Link

<table>
<thead>
<tr>
<th>Return Link Capacity</th>
<th>Configurable up to 500MHz per cluster</th>
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<tbody>
<tr>
<td>Technology</td>
<td>RCSX™ Return Link technology encompassing 3 waveforms:</td>
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<tr>
<td></td>
<td>- DVB-RCS2 / RCS MF-TDMA CF-DAMA (Combined Free and Demand Assigned Multiple Access), IP over RLE (DVB-RCS2) or ATM/MPEG (DVB-RCS)</td>
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<td></td>
<td>- Unique ASCPC™ long transmission bursts for higher density traffic</td>
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<td></td>
<td>- DVB-S2 SCPC (supported terminal models)</td>
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<td></td>
<td>- PowerACM™ support</td>
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<td></td>
<td>- High network utilization using QoS and ACM-driven Return Link BW assignment with free capacity allocation</td>
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<td></td>
<td>- Fast network convergence using dynamic logon-assigned BW</td>
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<td></td>
<td>- MF-TDMA mesh overlay option with supported VSAT Router models</td>
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</tbody>
</table>

### RCS MF-TDMA and ASCPC™ Channel Rate

- Up to 8Mps |

### RCS MF-TDMA and ASCPC™ Waveform

- DVB-RCS2: BPSK, QPSK, 8PSK, 16QAM |
- DVB-RCS: QPSK, 8PSK |

### RCS MF-TDMA and ASCPC™ Channel Spacing

- Up to 25Mbps each Return Link channel |

### SCPC Channel Rate

- 300Kbps up to 25Mps |

### SCPC Waveform

- DVB-S2 QPSK up to 32APSK |

### SCPC Channel Spacing

- 35% down to 5% |

### SCPC Channel Capacity

- Up to 75Mbps each SCPC Return Link channel |

### Hub IFL Input

- Frequency independent - 950 – 2150MHz |
- Up to 2450MHz option, C-band IFL option |

### Terminal IFL Output

- 950 – 2150MHz |

### Applications, PEP and QoS

<table>
<thead>
<tr>
<th>Connectivity</th>
<th>VLAN and VRF (Virtual Routing and Forwarding) (supported models only)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full multicast support from hub or from behind remote</td>
</tr>
<tr>
<td>Application Opti</td>
<td>TCP/IP, HTTP acceleration and DNS caching</td>
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<tr>
<td>Optimization</td>
<td>Cellular backhaul acceleration (supported terminal models only)</td>
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<tr>
<td>QoS</td>
<td>Built in embedded QoS support integrated with Forward and Return Link ACM</td>
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<tr>
<td>Multimedia Support</td>
<td>VoIP, video-over-IP / video-conferencing support</td>
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<tr>
<td></td>
<td>Virtual Telephony™</td>
</tr>
<tr>
<td></td>
<td>Multimedia QoS support, bandwidth assurance for clear VoIP QoE</td>
</tr>
<tr>
<td>Security</td>
<td>IPSec VPN encryption</td>
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<tr>
<td></td>
<td>Strong encryption option (supported models only)</td>
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</tbody>
</table>

### Network Virtualization

- SDN, NFV and MEC ready |

### User Plane Hub Interface

- IP over Ethernet, 100Mb Eth / 1Gb Eth / 10Gb Eth |

### Operations and Management

| Deployment        | RF, network-processing and management separation for flexible deployment: |
|-------------------| RF gateway diversity and distant data center, network over fiber |
|                   | RF-over-fiber support |
|                   | Flexible and scalable growth capability |
| Service High-Availability | Automatic switchover between geographically redundant gateways |
| Management System | Graphical role-based multi-service web-application SigmaNMS™ network management system. VNO support |

### 3rd Party Equipment

- 3rd party equipment may be supported using SNMP |

### Business Integration

- Integration with customer OSS and BSS systems using SOAP and REST API NBI |
- Traffic accounting NBI to external billing systems |
- Optional ASAT II™-tailed Satellite BSS |

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Specifications are subject to change without notice