Advantech Wireless

Millennium Series
High Capacity VSAT Hub

Features

- DVB-RCS compliant VSAT inbound carrier service
- DVB-S2 outbound carrier service
- DVB-S2 SCPC inbound service available (option)
- Advantech Wireless Adaptive Satellite Access Technology (A-SAT™) available (option)
- Modular design for easy expansion
- Single rack supports:
    - 5 x 200 Mbps outbound traffic carriers
    - 15 x 24 Mbps inbound traffic
    - 30,000 VSAT terminals
    - Completely redundant

Applications

The Advantech Wireless Millennium high capacity VSAT hub has been developed to enable Service Providers targeting to support large broadband interactive satellite networks.

Driven by the demand by consumers for always higher throughputs, the Advantech Wireless Millennium high capacity VSAT hub provides the service provider with an easily expanded platform to support tens of thousands consumer terminals in today's HTS satellite networks.

Overview

The Advantech Wireless Millennium high capacity VSAT hub is purposefully developed to meet the needs of large VSAT networks typically operating on High Throughput Satellites (HTS). The Millennium modular design is easily expanded as network size increases.

Each Millennium rack can comprise of up to six Forward Link Blocks in a 1:5 configuration and three Return Link Blocks in a 1:2 configuration. If a second rack is added, a 1:5 redundancy is available for the Return Link Blocks.

Each forward link block includes the Advantech FLS-1000 DVB-S2 modulator with an IP encapsulator followed by the ACM merger/slicer allowing transmission of up to 8 different MODCODs simultaneously. The ACM merger/slicer function provides feedback to the QOS-1000 device for traffic shaping and priority classification. The PEP-1000 performs TCP and HTTP acceleration, Payload and header compression, including RTP compression as well as HTTP pre-fetching and caching.

Each return link block consists of five multicarrier demodulators (MCD) and three processors. Each MCD can support up to 96 carriers with an aggregate throughput of 24 Mbps. Return carrier burst rates range from 128 kbps to 12 Mbps each. The processors schedule all traffic bursts dynamically within 26.5 milliseconds for the fastest satellite bandwidth scheduling refresh rate and the lowest jitter in the industry. The processors are also responsible for scheduling the SCPC-DAMA FDMA carriers when A-SAT™ is included the hub.

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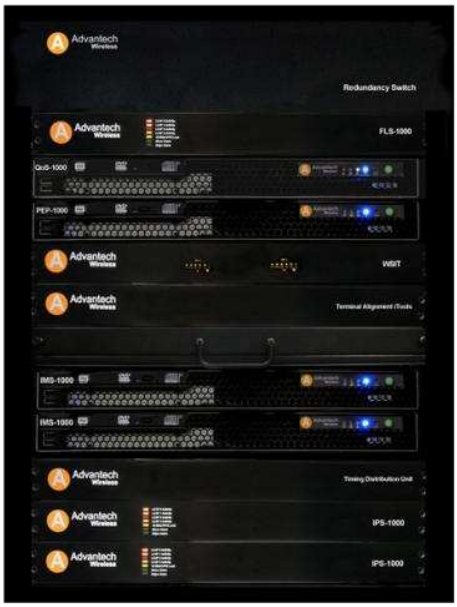
Millennium Hub Blocks

Millennium Hub Forward Link Block

- 3 RU Single Forward Link Block
- 200 Mbps of throughput
- QoS-1000
- PEP-1000
  If more FL capacity is required, additional FL Blocks added

Millennium Hub Return Link Block

- 4 RU Return Link (RL) Block
- 1:1 Redundant power supplies
- 5 MCD (multi-carrier demodulator) cards
- 3 RL processors
- Support for up to 10,000 terminals
  If more RL capacity is required, additional RL Blocks added



Millennium Hub Auxiliary Components

- Redundancy Switch for FL
- Standby Forward Link Block (for redundancy)
- Witness Terminal
- Terminal Alignment (iTools)
- KVM
- Redundant Network Management System of Millennium
- Redundant Timing Distribution Unit
- Redundant IPS-1000

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Millennium Hub Expanded Capacity Examples

4 Racks

- 4 x 5 x 200 Mbps forward link (FL) for a total of 4.0 Gbps
  - Each FL (total 20+4) can be on a different beam, polarization or satellite
  - 5:1 redundancy
- 4 x 15 x 24 Mbps return links (RL) for a total of 1.44 Gbps
  - Up to 5760 simultaneous RL MF-TDMA Carriers
  - Each RL MCD (total 60) can be on a different beam or satellite
  - Various redundancy options available
- Total of 120,000 terminals supported

6 Racks

- 6 x 5 x 200 Mbps forward link (FL) for a total of 6.00 Gbps
  - Each FL (total 30+6) can be on a different beam, polarization or satellite
  - 5:1 redundancy
- 6 x 15 x 24 Mbps return links (RL) for a total of 2.16 Gbps
  - Up to 8640 simultaneous RL MF-TDMA Carriers
  - Each RL MCD (total 90) can be on a different beam or satellite
  - Various redundancy options available
- Total of 180,000 terminals supported

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PRODUCT FEATURES & SPECIFICATIONS	
Air Interface—Outbound	DVB-S or DVB-S2, CCM/VCM/ACM, IP over MPEG/GSE
Modulation	QPSK (DVB-S), QPSK, 8PSK, 16APSK, 32APSK (DVB-S2)
Information Rates	Up to 200 Mbps (1Msps to 45Msps)
Air Interface—Inbound	DVB-RCS, IP over ATM or MPEG, Multiple Access Method MF-TDMA
Modulation	QPSK, 8PSK
Max Burst Info rates	128 kbps—12 Mbps
Coding	RS/Convolutional (DVB-S) or LDPC/BCH (DVB-S2) on the outbound; Turbo on the inbound
MAC Layer—Inbound	
Protocol	CF-DAMA (Combined Free & Demand-Assigned Multiple Access)
QoS Capacity Requesting	Constant Rate Assignment (CRA), Volume Based Dynamic Capacity (VBDC), Rate Based Dynamic Capacity (RBDC), Free Capacity Assignment (FCA)
Bandwidth on Demand (Return Link)	0-12 Mbps per carrier updated every 26.5 ms, framed in 1 or 2 ATM or 1 MPEG packet, with in-band and out-of-band capacity requesting mechanisms
Interfaces	
Network	IP over Ethernet (10 GigE)
NMS	NetManager™, web interface control, remote terminal management, Virtual Network Operator (VNO)
3rd Party Equipment	Standard SNMP interfaces available
Tx & Rx	Frequency Independent (can use any combination of C, Ku, Ka, X, etc.) Can interface with any frequency at L-band IF frequency
RLSS Expansion Options	
Additional Return Link	Each MCD is programmable with up to 96 carriers, at rates from
Carriers and Rates	128 kbps—12 Mbps up to a maximum total of 24 Mbps per carrier
Maximum number MCD per Return Link Block	5
Additional Terminals	Each additional processor can support hundreds to thousands of terminals
Units/Racks	Non-redundant and redundant Hub solutions available in standard rack configurations. The RLSS is assembled in standard 19” telecom racks. All RLSS functions are housed in the same unit. Scaling involves adding additional cards, and then additional FL or RL units and then additional racks as required to expand terminal and throughput capacity.
FLSS Expansion Options	
Additional Forward Link	Up to 5 Forward Links supported per rack
Transport Streams and Rates	Each forward link 1Msps to 45Msps up to 200 Mbps
Up to 5 FL per rack with 1:N redundancy	
Included Features	
Fade Countermeasure	ACM
PEP & Compression	TCP/HTTP Acceleration & Data Compression
VoIP	Virtual Telephony™, Advanced QoS
Multicast	From hub or from behind remote
Options	
Redundancy	Non-Redundant, 1:N Redundant
Multiple Satellites/Beams	Designed to support multiple satellites in mix of frequencies
Standard Network Architecture	DVB-RCS
Optional Architecture	DVB-SCPC, Multi-mode (DVB-RCS/DVB-SCPC), Mesh/Star
Geographic Redundancy	Automatic switchover between geographically redundant gateways
Scalability	Scalable forward & return link capacities + number of supported remote terminals
Mesh	Mesh overlay (option)
Higher Layer Protocol Options	IPSec/VPN, VLAN
Access Technology	MF-TDMA, SCPC, A-SAT™

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