![Advantech Wireless logo]

Features

- Up to 135 Mbps outbound / Up to 6 Mbps inbound per carrier
- DVB-S2 CCM/VCM/ACM outbound maximizes bandwidth efficiency
- Optimized for IP and multi-media content
- Open standard design (DVB-RCS)
- Qualified with multiple IP/DVB broadcast platform vendors
- Interoperable with 3rd party SatLabs certified terminal vendors
- Unique and powerful multi-carrier demodulation technology
- World-class scheduling efficiency, maximizing bandwidth utilization
- Always-on
- User-friendly Network Management System (NMS)
- Multi-Mode DVB-RCS and DVB-SCPC network architecture support
- Mesh Overlay (peer-to-peer) optional capability

Overview

Advantech Wireless, a world leader in satellite communications, offers the world's leading, two-way, open standard (DVB-RCS), broadband satellite access system. DVB-RCS Hub, and in particular its Return Link Sub-System (RLSS), is at the heart of the broadband access system.

Hubs (including the RLSS) are turn-key systems which can be installed in days to enable a wide range of public and/or private network topologies with satellite interactive terminals.

The RLSS from is a modular hub sub-system which can be integrated with new or installed IP/DVB broadcast platforms and IP switch/routing equipment to provide two-way satellite broadband access services.

The RLSS is designed to receive inbound traffic, handle inbound and outbound signalling, schedule and control networks of satellite interactive terminals (available from multiple suppliers). A single scalable RLSS unit can support networks ranging from just tens to thousands of simultaneously logged-on terminals.

System Costs

Advantech Wireless' Hubs and Terminals are highly flexible; several different network architectures are possible. Some key features of the DVB-RCS Hub include:
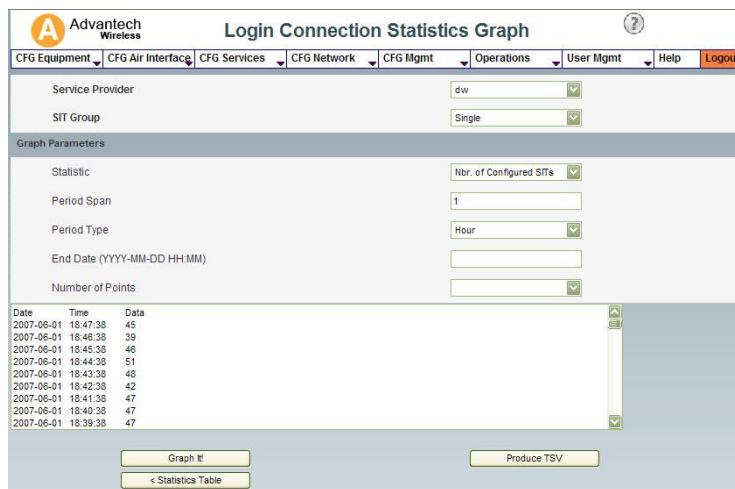
- Frequency independent—hubs, terminals and onboard processors can be operated in any frequency band (e.g., Ku, Ka, C, X or hybrids of these).
- Satellite versatility—the system can operate with the forward and return link on the same satellite, or on different satellites.
- Multi-mode System capability— evolves the DVB-RCS standard one step further by allowing for a centrally managed hybrid DVB-RCS and DVB-SCPC network.
- Terminal diversity—networks can support receive-only terminals at the same time as two-way terminals, as well as both mesh and star topologies of terminals.

Advantech Wireless' entire system, as well as the DVB-RCS standard, have been designed to minimize the cost of scaling a broadband access network from terminal populations as small as a few tens of terminals to tens of thousands.

Performance of access layer protocols is highly dependent on traffic profile. Advantech Wireless' implementation of DVB-RCS, utilizing dynamic assignment techniques mandated in the DVB-RCS specification, has been specifically designed and tuned for multi-media traffic. In comparison, other VSAT systems are less dynamic and less flexible.

NetManager™

Advantech Wireless' has responded to market demands by developing a powerful management system capable of meeting the functional and scalability requirements of a variety of system configurations. The Hubs feature the NetManager™, which provides Hub & Network Operator Tools, Service Provisioning Tools and Multiple User Interfaces. The management of SLAs, Return Link and Forward Link Quality of Service (QoS) and the daily management of SITs, is made easy with the use of the NetManager™.

VSAT Hubs

Advantech Wireless Multi-Mode Architecture

The Advantech Wireless multi-mode connectivity offering revolves around taking the DVB-RCS standard and evolving it one step further. The Advantech multi-mode approach delivers open standard benefits to fixed and mobile users. The S5420 VSAT terminal has the ability to be reconfigured between DVB-S/S2/TCC (SCPC) and DVB-RCS (MF-TDMA). Multi-mode operation brings an extra dimension to networks where the need for SCPC connectivity is frequent within the population of terminals but occasional at the individual terminal level.

The hub provides the forward link DVB-S2 modulated service to the multi-mode terminal using the standard DVB-RCS forward link. The return link operates typically in DVB-RCS mode but can switch to a DVB-S/S2/TCC SCPC mode through the hub station NMS which provides centralized management of the system. The switching mechanism, on the return link, between the DVB-RCS TDMA system and the DVB-S/S2/TCC SCPC modes is customer controlled and can be commanded by the hub Operator.

The Multi-Mode solution, with its scalability and flexible mix of DVB-SCPC and DVB-RCS terminals, offers a very cost-competitive solution for any size network. With the addition of the Mesh Overlay capability, Satnet offers a powerful network architecture that can meet the demanding requirements for virtually any application.

Advantech Wireless Hub Systems Offerings

DVB-SCPC HUB	MICRO HUB	MINI HUB	MAXI HUB

DVB-SCPC HUB
- 10's to 100's of remotes
- SCPC Inbound
- DVB-S/S2 Outbound

MICRO HUB
- Up to 100 remotes throughput
- 18Mbps aggregate
- Full Featured
- Mesh Sub networks
- DVB-SCPC
- DVB-S/S2 DVB-RCS

MINI HUB
- Scalable
- Up to 500 (1500) remotes throughput
- 55 Mbps aggregate
- Full Featured
- Mesh Sub networks
- DVB-SCPC
- DVB-S/S2 DVB-RCS

MAXI HUB
- Custom Networks
- Scalable
- Up to 3000 remotes throughput
- 155 Mbps aggregate
- Full Featured
- Mesh Sub networks
- DVB-SCPC
- DVB-S/S2 DVB-RCS

VSAT Hubs

Advantech Wireless

Air Interface—Outbound	DVB-S or DVB-S2, CCM/VCM/ACM, IP over MPEG
Modulation	QPSK, 8PSK, 16APSK, 32APSK
Information Rates	Up to 135 Mbps (1Msps to 45Msps)

Air Interface—Inbound	DVB-RCS, IP over ATM or MPEG Multiple Access Method	MF-TDMA
Modulation	QPSK, 8PSK optional	
Max Burst Info rates	64 kbps—6 Mbps	

Coding	RS/Convolutional or LDPC on the outbound; Turbo on the inbound

MAC Layer—Inbound	
Protocol	CF-DAMA (Combined Free & Demand-Assigned Multiple Access)
QoS—Capacity Requesting	Reserved Capacity (CRA), Volume Based Dynamic Capacity (VBDC), Rate Based Dynamic Capacity (RBDC), Free Capacity (FC)
Bandwidth on Demand (Return Link)	0-6 Mbps every 26.5 ms, framed in 1, 2 or 4 ATM or 1 MPEG packet, with in-band and out-of-band capacity requesting mechanisms

Interfaces	
Network	IP over Ethernet (10/100/1000BaseT)
NMS	NetManager™, web interface control, remote terminal management, 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 Carriers and Rates	- Demodulator is programmable with up to 96 carriers, at rates from 64 kbps—6 Mbps up to a maximum total of 24 Mbps - Each additional demodulator can provide up to 24Mbps of throughput
Additional Terminals terminals	Each additional processor can support hundreds to thousands of
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, then additional units and then additional racks as required to expand terminal and throughput capacity.

Included Features	
Fade Countermeasure	VCM/ACM, ClearSky™
PEP & Compression	TCP/HTTP Acceleration & Data Compression
VoIP	Virtual Telephony™ QoS Advanced QoS
Multicast	From hub or from behind remote

Options	
Redundancy	Non-Redundant, Hitless Hot Redundant, 1:N Redundant
Multiple Satellites/Beams	Designed to support multiple satellites in mix of frequencies
Network Architecture	DVB-RCS, 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 remotes
Mesh	Mesh overlay
Higher Layer Protocol Options	IPSec/VPN, VLAN