



SatNet Series 5000 DVB-RCS VSAT Terminals



> SatNet Series 5000 Terminals

Advantech Satellite Networks SatNet Series 5000 terminals are full-featured DVB-RCS compliant terminals. These rack-mountable units have a slim 1U form factor.

The SatNet Series 5000 offers Star or Mesh connectivity to your corporate LAN and is one of the fastest and most full featured satellite interactive terminals available today. A truly corporate solution, the SatNet Series 5000 is designed to provide enterprise-level quality of service demanded of today's connected world at return link rates up to 6 Mbps. As a replacement to your existing T1 or E1 line or as a backup, the SatNet Series 5000 always-on performance achieves optimal bandwidth efficiency thanks to DVB-S2 support and VCM/ACM capability. And thanks to its high power internal supply, the SatNet Series 5000 will provide inline power to BUCs up to 4W without any add-on equipment.

Model Options :

- S5100: basic DVB-RCS Star capability
- S5200: Star+Transparent Mesh Overlay
- S5300: Advanced DVB-S2 (VCM/ACM, 16APSK)
- S5400: DVB-SCPC/RCS Pay-as-You-Grow™

Features:

- DVB-S2/S downstream up to 80 Mbps (hub to remote) with the Ethernet throughput up to 40 Mbps
- Up to 6 Mbps upstream (remote to hub)
- GUI-based control panel
- Easy-to-configure Ethernet connectivity to your PC, LAN or Router
- On-board TCP and HTTP acceleration
- Application QoS
- VoIP support
- VPN and accelerated VPN support (optional)
- VLAN support (optional)
- GPS input port

- Easy and simple installation
- 19in rack mountable

Sample Applications:

High Performance & Mission Critical Applications, VoIP, Video Conferencing, Corporate Networking, Multicasting, Broadcasting, Backup, Distance Learning, SCADA, and more...

Sample Markets:

- Enterprise/Corporate
- Government
- Emergency Management
- Telemedicine
- And more...

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WE ARE...

FIRST TO MARKET WITH PREMIUM VSAT CAPABILITIES

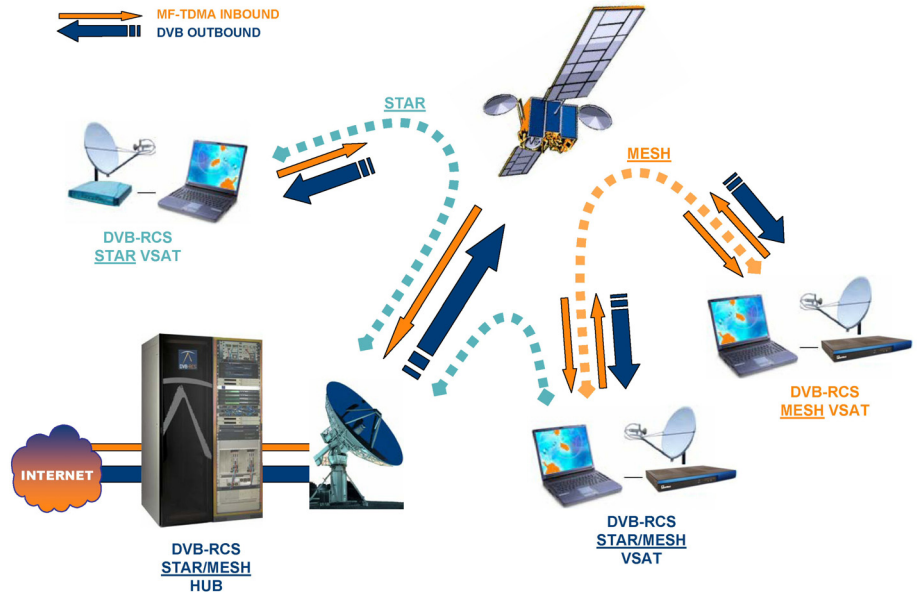
FEATURING...



MESH SOLUTION

Highlights

- MF-TDMA dual mode star/mesh link: same air interface as for star return link
- Multi-band, multi-beam and multi-satellite mesh operation (advanced option)
- Simultaneous star and mesh operation
- Separate IFL for mesh receiver (for multi-band and/or opposite polarization operation)
- Mesh signaling in accordance with DVB-RCS standard
- Fully dynamic mesh capacity assignment
- QoS support for mesh traffic



The transparent mesh option allows the SatNet **S5200** to be part of a peer-to-peer overlay network, in which terminals communicate directly with each other through the satellite transponder. This cuts in half both the transmission delay and the bandwidth occupied by such traffic, bringing advantages for both communications quality and cost; the greatest benefits are achieved for delay-sensitive real-time applications such as voice.

Mesh-equipped terminals can communicate simultaneously with other mesh terminals and with the hub; adding the mesh option does not affect the conventional DVB-RCS functionality and the mesh functionality is a fully backwards-compatible extension of the DVB-RCS standard. Within the mesh overlay part of the system, the primary functions of the hub are to allocate bandwidth to terminals and to control and manage them.

This mesh network functionality is called "transparent", because it operates through a conventional satellite transponder. In other words, it does not need any specialized on-board processing. When used in conjunction with a suitable hub such as the SatNet mesh-enabled hub, the **S5200** terminal supports connectivity limited only by the space segment design: it supports single-beam configurations, multi-beam configurations with different cross-strapping constraints and even multi-satellite configurations. The mesh and conventional "star" operation can be on different polarizations and/or in different frequency bands.



ADVANCED DVB-S2 SOLUTION

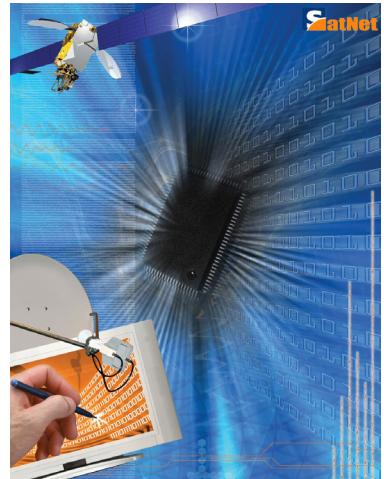
The new **DVB-S2 standard** offers very significant bandwidth savings in the outbound link of DVB-RCS systems, compared to the current DVB-S standard. The simplest form of DVB-S2 is known as Constant Coding and Modulation (CCM). This is a direct replacement for DVB-S, but offers a 30% better bandwidth efficiency, thanks to the use of sophisticated channel coding techniques. The SatNet terminal supports CCM as well as DVB-S. With the Advanced DVB-S2 option, the SatNet **S5300** supports two additional, advanced modes of DVB-S2 known as Variable Coding and Modulation (VCM) and Adaptive Coding and Modulation (ACM). The choice between the latter two is usually driven by system characteristics such as frequency and precipitation statistics. All three forms of DVB-S2 (CCM, VCM and ACM) have been adopted by the DVB-RCS standard. DVB-S2 terminals are thus fully interoperable.

VCM allows optimization of the transmission parameters used for each terminal, so that the link budget — and hence the achievable bandwidth efficiency — is no longer driven by the worst case terminal in the system. Differences that can warrant such optimization include dish size, location in satellite beam and prevailing local rain statistics. Depending on system characteristics, a VCM system can achieve a gain in bandwidth efficiency of close to 50% over a DVB-S system.

ACM takes this optimization further and allows variation in time of the modulation and coding used for each terminal. The adjustments are based on feedback reports of the terminal's received signal quality. This ability to respond in real-time eliminates the need for fixed system margins for e.g. rain fade and interference. The margin savings can be converted to increased bandwidth efficiency. Depending on system characteristics, the gain over CCM systems can reach 50–100%.

Besides VCM and ACM, the Advanced DVB-S2 option offers additional valuable features:

- Symbol rates of 128 kBaud – 45 MBaud
- Support for 16APSK modulation, for extremely high bandwidth efficiency
- ACM quality feed-back through satellite return link signalling or dial-up telephone line.



PAY-AS-YOU-GROW™ SOLUTION

The **Pay-as-You-Grow™ approach** enables service introduction with very small initial investment and preserves the investment as the system expands. Initially, when the number of deployed terminals is very small, the per-user cost of a full-featured hub that supports demand-assigned management of the return link bandwidth can be significant. In such small networks, it can be beneficial to defer the cost of the full-featured hub and accept temporarily a potentially less efficient return link bandwidth utilization. In SatNet's Pay-as-You-Grow™ concept, this is achieved by implementing the return link as a form of single-channel-per-carrier (SCPC) operation; i.e., using semi-permanent, continuous connections from each terminal to the hub. When the number of deployed terminals grows, the hub and terminals can be upgraded to fully DVB-RCS compliant, demand-assigned operation.

The forward (outbound) link is shared among the terminals in the same manner in all stages of the Pay-as-You-Grow™ evolution of the network.

The SatNet **S5400** fully supports the Pay-as-You-Grow™ concept. It can be deployed as an SCPC terminal, and later upgraded to full DVB-RCS functionality simply by configuring the software over the air. No hardware modifications or upgrades are necessary. The change can even be completely transparent to the end user.



SATNET SERIES 5000 VSAT FEATURES & SPECIFICATIONS

Network Architectures

Sample Services

Quality of Service

Air Interface

Star, OBP Mesh, Transparent Mesh (S5200 model)

DVB-RCS, TCP/IP, UDP/TCP, Unicast, Multicast, Broadcast

HTTP, SNMP, ICMP, IGMP, DHCP, RIP, RTP, C2P, VLAN (option)

Multiple Queues, Filtering on IP Header, QoS Groups

Downstream (hub to remote):

- DVB-S (QPSK), DVB-S2 CCM (QPSK & 8PSK), DVB-S2 VCM/ACM (incl. 16APSK) (S5300 model)

- Encapsulation: IP over MPEG with section packing

Upstream (remote to hub):

- DVB-RCS (QPSK), 8PSK

- SCPC (QPSK, 8PSK) (S5400 model)

- Encapsulation: IP over ATM, IP over MPEG with section packing

RS/Convolutional or LDPC on the downstream; Turbo on the upstream

Can receive the entire DVB-S2 80 Mbps carrier with a maximum Ethernet throughput of 40 Mbps. Can transmit up to 6 Mbps.

64 kbps—6 Mbps in 16 kbps increments

Ethernet 10/100 BaseT, RJ45 connector

L-Band Rx; L-Band Tx; F-type connectors

RS-232 NMEA GPS input port (with Series 5000 IDU)

Included

Optional

IPSec option (3DES or AES)

Coding

Data Rates

Upstream Burst Rates

Network Interface

ODU Interface

GPS Interface

TCP/HTTP Acceleration

Data Compression

Security

Network Management

BUC Size

Supply Voltage

Certifications

Outdoor Unit

Outdoor Units should be dimensioned for each satellite & application on a case by case basis to satisfy needs & requirements

Variables

- Data Rate
- Dish size
- Tx Power
- Link Quality & Availability

Frequency Combinations Potential Dimensioning Sets (for Star Network Architectures)

Ka/Ku	128kbps:	75cm/1W
	512kbps:	90cm/1W
	2.048Mbps:	1.2M/2W
Ku/Ku	128kbps:	90cm/1W
	1.024Mbps:	1.2M/2W
	2.048Mbps:	1.8M/ 4W
	4.096Mbps:	1.8M/ 8W (external supply)
C/C	128kbps:	1.2M/5W
	256kbps:	1.8M/5W
	512kbps:	1.8M/10W (external power supply)