Many Markets, One Platform

SKYEDGE II-C SYSTEM

INTEGRATED HUB FOR MULTIPLE MARKETS

A single VSAT platform that can deliver all of a network operator’s services is a valuable commodity, particularly as VSAT communications grows in scope in markets including Mobility, Backhaul, Consumer and Enterprise. To meet this need, Wavestream has drawn on 30 years of experience in satellite communications to bring you the multi-market SkyEdge II-c platform. This high-performance hub system, along with comprehensive network management and a family of mission-specific terminals, enables satellite service providers to support any market.

SCALABLE IN ALL DIMENSIONS

SkyEdge II-c is designed to support the needs of any hub network operator, whether you’re adding to the number of services you’re offering, ramping up your network’s data traffic, or increasing the number of frequency bands, carriers, satellites or satellite beams to which you connect.

This VSAT platform features a scalable distributed network architecture, enabling efficient and robust HTS ground segment deployment over any number of satellite gateway locations, data centers and network operations centers. Advanced high-density chassis architecture minimizes rack space and power.

SkyEdge II-c makes it easy to expand capacity as demand grows and extend services to new markets with minimal investment. Full service automation, including VSAT installation certification, is handled without human intervention, enabling scalable and simple service activation without a single phone call. Our simple VSAT installation, including a Do-It-Yourself option for the consumer market, reduces setup costs and thereby reduces service subsidies.

FLEXIBLE VNO MODELS FOR HOST NETWORK OPERATORS

SkyEdge II-c supports several managed services models for Virtual Network Operators (VNOs):
- Hardware VNOs – VNO service utilizing dedicated Tx/Rx hardware components with inbound and outbound MHz capacity
- Software VNOs – VNO service utilizing shared hub resources with inbound and outbound Mbps capacity
- Cloud VNOs – VNO service over multiple spot beams and satellites, leveraging a shared pool of network functions, data processing, and space segment spectrum

BENEFITS

- Flexible hub platform supports all market segments, reducing operator risk and enabling sharing of satellite bandwidth for multiple applications
- Supports multiple VNO service models
- Highly scalable VSAT system supports any number of frequency bands, carriers, satellites or satellite beams
- Integrated and redundant hub chassis system provides high-availability service and reduces rack space and power
- Family of VSATs optimized for specific markets

www.wavestream.com | sales@wavestream.com
Using the SkyEdge II-c Total NMS management system, VNOs have full control of their terminals and full flexibility to define and manage their own services. They also gain detailed VSAT monitoring information such as VSAT status, bandwidth usage and RF levels.

**HIGH PERFORMANCE TERMINALS**

The SkyEdge II-c VSAT portfolio features high-performance router/modems that enable next-generation, high-speed services via satellite.

Our family of VSATs utilizes multi-core processor technology and integrated acceleration, caching and security technologies to ensure a superior and secure user experience.

**RICH FEATURE SET**

SkyEdge II-c delivers innovative transmission technologies with exceptional performance and space segment efficiencies. Wideband DVB-S2X carriers in the forward direction and adaptive transmission in the return direction, enable high on-the-move service availability and maximum bandwidth efficiency at any condition – at beam peak, beam edge, at fade and at different traffic demands. This is achieved by adaptive power control, changes to the carrier symbol rate, ModCod and spread-spectrum factor per VSAT on a per time-slot basis.

The SkyEdge II-c system employs advanced features and capabilities that help you deliver competitive services while simplifying your network operations.

- Robust bi-directional QoS – embedded in the platform, SkyEdge II-c QoS supports various rate bundles per site, wholesale (VNO level) CIR/MIR bundles, DiffServ, flow and application priority, and VoIP call admission control to ensure voice and video quality
- Multi-tiered acceleration – enables fast web surfing and application response time using TCP acceleration, HTTP acceleration, DNS caching, pre-fetching, compression and web optimization, and IP header compression
- Enhanced System Security – provides secure transmission over the satellite link by utilizing high-performance, HW-based AES-256 encryption. The system also employs X.509 terminal authentication

Certain SkyEdge II-c features particularly enhance specific applications:

**MOBILITY** – Beam and satellite switching, on-the-move antenna and BUC communications interfaces, and a comprehensive network management system for mobility terminals.

**BACKHAULING** – Unique patent-pending 3G/LTE cellular data acceleration overcomes satellite latency and enables mobile handsets to achieve maximum download speeds of up to 200Mbps

**BROADBAND ACCESS** – Enhanced usage based services and integrated site level accounting deliver flexible and competitive service plans

**ENTERPRISE** – With its rich IP Stack, SkyEdge II-c provides comprehensive IP and routing capabilities and other Enterprise-related features.

**HIGH AVAILABILITY DENSE ARCHITECTURE**

The centralized management system and redundant hub baseband architecture facilitates support for unmanned gateway operations.

- High-Availability System – 1:N redundancy and automatic failover of all hub components ensure very high system uptime. Integrated redundant 10Gb packet switching architecture and an advanced backplane design connecting all hub components guarantee high system reliability
- Unattended Hub Operations – remote visibility, management and control of all hub elements enable centralized management, thereby drastically reducing OPEX while enabling remote expert analysis of system behavior
- High Density Hubs Reduces Rack Space and Power – compact chassis architecture for transmit modules, receive modules and servers provide high throughput performance while minimizing rack space and power
- GW diversity solutions for fade mitigation – capable of fade detection at each RF gateway and activation of a secondary diversity site with seamless RF or Layer II switching
- Disaster recovery – when an enhanced availability service is required, a secondary baseband hub, data center or NOC may be installed at a disaster recovery facility
CHASSIS DESIGN
The SkyEdge II-c hub system is designed to provide maximum service time while simplifying your network operations. The hub system comprises an advanced high-density multi-beam X-Chassis coupled with a complete network management system. The main advantages of the chassis are:
- Hot Swappable Modules – eliminating network downtime
- Backplane Design and Redundant LAN Switches – eliminate external LAN wiring complexity
- Software-defined RF Matrix – simplifies network operations and improves unattended hub operations
- Remote Management – remote control of all components simplifies support and shortens time for trouble resolution

UNIFIED AND CENTRALIZED TOTALNMS
SkyEdge II-c includes an advanced Total Network Management System, enabling full configuration, control and monitoring of all hub elements and remote terminals, regardless of their physical location.

TotalNMS includes the following key attributes:
- Network Dashboard – a comprehensive set of network indicators providing real time and trending information on network throughput, utilization, and alarms
- One-Click Management – an intuitive GUI, with easy-to-use configuration tools and advanced diagnostic capabilities, providing effortless provisioning and troubleshooting for networks of any size
- Global User Access – standard web interface allowing access from any PC connected to the secured management network
- Customized User Administration – flexible and highly granular mechanism, enabling user permissions settings according to VNO service model and individual job function

SERVICE AUTOMATION
SkyEdge II-c enables full automation of service activation, providing operational simplicity and reduced OPEX. Service activation comprises antenna pointing, RF certification and auditing, and optional ISP authentication.
- Antenna Pointing – Simple VSAT installation, including Do-It Yourself options, expedites deployment and reduces costs - the VSAT terminal is designed with minimal assembly parts and an easy-to-point antenna. In addition, Ka-band and Libra terminals are equipped with audible indicators to assist in the fine antenna pointing. The VSAT terminal includes an intuitive GUI that guides the installer step by step through the installation process.
- RF Certification – SkyEdge II-c VSAT Auto Pointing System (VAPS) enables automatic RF certification of VSAT installation based on local/regional beam parameters. VAPS also includes RF auditing: this allows the hub network operator to configure an automatic, periodic audit of the installed terminal base to identify antenna misalignment issues over time.
- ISP Authentication – once the VSATs pass the RF certification, it is possible to redirect web traffic to a specific ISP to complete the service activation process. The ISP will authenticate end users and enable them to update their billing information and select a service plan.

User-friendly interface simplifies service activation
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TECHNICAL SPECIFICATIONS

GENERAL

Frequencies: Ka, Ku, C
Topology: Star, distributed hub architecture (multiple GWs, NOC)

FORWARD CHANNEL

DVB-S2 ACM
Carrier rate per NS: 1.5Msps-65Msps (235Mbps)
Modulation: QPSK, BPSK, 16APSK, 32APSK
Coding: LDPC
FEC: 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9
Roll-off: 1.1, 1.2

DVB-S2X ACM
Carrier rate per NS: 1.5Msps–500Msps (3.5Gbps)
Modulation: QPSK, BPSK, 16APSK, 32APSK, 64APSK, 256APSK
Coding: LDPC
FEC: All FECs
Roll-off: 1.05, 1.1, 1.2

RETURN CHANNEL MF-TDMA

WHEN USING DVB-S2X AS FORWARD CARRIER

Access Scheme: MF-TDMA, Adaptive
Carriers rates: 128Ksps - 30Msps
Max Data Rate: 100Mbps (accelerated)
Modulation: BPSK, QPSK, 16QAM
Coding: LDPC
TDMA FEC: 1/4, 1/3, 2/5, 1/2, 2/3, 4/5, 6/7
Roll-off: 1.2, 1.1
Spread Spectrum FEC: BPSK 1/4, 1/3, 2/5, 1/2

RETURN (SCPC)

SCPC Symbol Rates: 1.5 – 40Msps
SCPC waveform: DVB S2 ACM
SCPC Modulation: QPSK, BPSK, 16APSK
SCPC FEC: 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9

FEATURES

IP: IPv4/IPv6, TCP, UDP, ICMP, DHCP, NAT/PAT, DNS Caching, cRTP, IGMIPv2/v3, SIP, DiffServ, VLANs, RIPV2, Static Routes, BGP
Transparent PEP: Integrated TCP Acceleration, HTTP web pre-fetching and compression, RTP header compression, SIP aware VoIP, IP header compression, Cellular GTP data acceleration
QoS: Integrated, DiffServ, Multi-Level CIR//MIR (User, Group)

Usage Services:
Integrated quota-based service definition system, Per ISP/VNO, forward & return quota, free usage time zones, quota reset, usage top-ups
Security:
AES-256 bit encryption, ACL, Firewall, X.509 Terminal Authentication, VSAT IP-SEC client

SYSTEM SCALABILITY

Forward channel scalability:
Up to 1,000 carriers, spread over any number of gateways, satellites, or beams
Terminals: Up to 1,000,000

MANAGEMENT

System:
Single centralized TotalNMS
Framework:
ITU / IETF standards-based
GUI Interface:
Web-based over HTTPS
Access Control:
Per User permission management
Northbound Interface:
SOAP over HTTPS, SNMPv2c
IDU Antenna Interface:
Gilat’s Antenna ICD, OpenAMIP

ABOUT WAVESTREAM

Wavestream sets the standard in the design and manufacture of next generation high power solid state amplifiers. Wavestream's Family of Ka, Ku and X-band Solid State Power Amplifiers (SSPAs), Block Upconverters (BUCs) and transceivers provide systems integrators with field-proven, high performance solutions designed for ground mobile and fixed, gateway and airborne satellite communication systems worldwide.

These items are subject to the Export Administration Regulations (EAR), 15 C.F.R. Parts 730-774, and may not be exported or transferred to any non-U.S. person, except as authorized by the U. S. Department of Commerce.

CONTACT US

545 West Terrace Drive
San Dimas, California 91773
USA
T. +1 909 599 9080
F. +1 909 599 9082
www.wavestream.com
sales@wavestream.com

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