Viasat continues to offer the most innovative satellite networking products with the introduction of its most advanced full-mesh MF-TDMA LinkWay S2™ system to date. Battlefield-proven LinkWay S2 modems provide secure at the halt (ATH) and on the move (OTM) satellite communications between users in a single full-mesh MF-TDMA (multi-frequency time division multiple access) network.

Delivering true network-centric connectivity, the LinkWay S2 system seamlessly integrates voice, video, and data applications, automatically routing mission-critical information over a mesh single satellite hop network via unicast or multicast.

Expanding on the capabilities of the successful LINKWAY® 2100 current force modem, LinkWay S2 modems are more efficient than ever before. DVB-RCS turbo coding and minimally short burst preambles provide quasi-error free communications with minimal carrier power requirements and maximum efficiency. Added 8PSK modulation provides dramatically improved spectral efficiency, while the included BPSK modulation and low \( r = 1/3 \) error correction coding offers support for ultra-small, sub 1-meter antennas for ATH or OTM communications. LinkWay S2 modems offer an extended carrier rate range, from 312.5 kbps up to an industry-leading 10 Mbps. This allows greater flexibility for both high-throughput applications, such as video, or low-throughput applications, such as voice, enabling system operators to select the optimal carrier rate(s) for their particular network traffic profile.

Unique in the industry, the full-mesh LinkWay S2 modem has completely independent fast-hopping transmit and receive paths. The transmit modulator and receive demodulator can each tune to different carriers on a burst-to-burst basis, independently and automatically, across a 1.1 GHz frequency range spanning multiple transponders, carrier rates, carrier coding rates, and carrier modulations. This allows the most efficient allocation of bandwidth, regardless of the burst timeslot or carrier frequency, for the most flexible and frequency-agile system available. LinkWay S2 modems are currently operating on Wideband Global SATCOM (WGS) satellites and can be used over any commercial or military satellite on C, X, Ku, or Ka-band using loop-back, split-beam or cross-strapped transponders.
SPECIFICATIONS

NETWORK CONFIGURATION

- **Topology**: Full-Mesh, Star, and Hybrid
- **Symbols Per Second (DVB-S2)**: 0.3125, 0.625, 1.25, 2.50, 5.00, 10.00 Mps
- **Spread Factors**
- **Chip Rates**: 1.25, 2.50, 5.00, 10.00 Mcps

INTERFACES

- **Mesh Transmit IF**: 950 to 2050 MHz, 0 to -30 dBm, Type-F
- **Mesh Receive IF**: 950 to 2050 MHz, -35 to -75 dBm, Type-F
- **DVB-S2 Receive IF**: 950 to 2150 MHz, -90 to -140 dBm/Hz
- **Reference and Power**: Software controllable DC power and 10 MHz reference on each IFL interface
- **User Data Ethernet Port**: 10/100BASE-TX, RJ-45
- **Management Console**: RS-232, RJ-12
- **ACU I/O or GPS Input**: RS-232, RJ-12
- **External Reference**: 10 MHz, BNC
- **External Media Access**: USB 2.0, USB-A, Female
- **Summary Alarm**: Form C Contact Closure, DB9

TRANSMISSION SECURITY

- **Link Encryption**: AES 256-bit bulk encryption of the user data plane and the network control data plane
- **NIST Certification**: FIPS 140-2, Level 2
- **Traffic Load Masking**: Generation of MF-TDMA fill bursts
- **Key Field Interface**: DS-101

TRAFFIC ENGINEERING

- **QoS Queuing Type**: Priority Queuing or CBWFQ
- **Number of QoS Queues**: 16
- **QoS Queuing Mapping**: Configurable by IP DSCP
- **Priority Burst Types**: CIR (Static & Dynamic) bursts
- **Traffic Burst Types**: Unicast or Multicast

ENVIRONMENTAL AND PHYSICAL

- **Temperature Range**
  - Operational: 0° to +50° C
  - Storage: -40° to +70° C
- **Relative Humidity**
  - Operational: 0 to 95% (NC) at 50° C
  - Storage: 0 to 95% (NC) at 70° C
- **Shock/Vibration**: Remains operational when subjected to the operational shock/vibration profiles as specified in MIL STD 810F
- **Dimensions (W x H x D)**: 17.0 x 1.75 x 15.7 in.
- **Weight**: 7.5 lb

ELECTRICAL

- **AC Prime Power**: 100 to 240 VAC, 47 to 63 Hz
- **Power Consumption**: 55 W (excluding external ODU)

BACKWARDS COMPATIBILITY

Through a software configuration, a LINKWAY® 2100 compatible operational mode can be enabled, providing full interoperability with fielded LINKWAY 2100 series networks. Changing configuration from the legacy operational LINKWAY 2100 mode to the more efficient LinkWay™ mode requires only an over-the-air software download to remote modems and can be done from a centrally-managed location.

FIPS 140-2, LEVEL 2 SECURITY

With an embedded FIPS 140-2, Level 2, AES 256-bit based transmission security (TRANSEC) module, the system ensures secure connectivity and protects sensitive communications. Using transportable and mobile SATCOM platforms equipped with LinkWay™ modems, deployed warfighters can communicate securely with other LinkWay™ modems, fixed, ATH, or OTM equipped terminals.

MESH MOBILITY (ON THE MOVE)

LinkWay mesh networks support both ATH and OTM terminals. When combined with GPS, terminal acquisition, synchronization and timing are automatic even when the terminal is in motion. The new LinkWay waveform enables FCC/ITU compliant operation of the LinkWay™ modems, using ultra-small antennas typically used in OTM platforms.

INTEGRATED DVB-S2 RECEIVER/DECODER

A DVB-S2 Integrated Receiver/Decoder (IRD), with EN 302 307 compliant coding, provides bandwidth-efficient broadband download capability simultaneous with MF-TDMA operation. Higher throughputs at lower Eb/No enable broadband connections into reduced size terminals. Additionally LinkWay™ modems can use this capability with any standard EN 302 307 DVE-S2 modulator and IP encapsulator.

NETWORK MANAGEMENT

LinkWay™-based terminals are controlled by a full-featured network control center (NCC) management station. The one-rack-unit NCC server connects to any standard LinkWay™ modem and manages TDMA network timing, synchronization, terminal acquisition, network configuration, and bandwidth management. The NCC also acts as the network management system (NMS) server, a client-server system with a https-based graphical interface. With this approach, a PC-based remote NMS client can securely access the NCC server from anywhere in the world (with appropriate security restrictions). NMS user windows provide network status, network station maps, system configuration, alarm status, connection set-up, accounting, link performance, and diagnostic commands. Furthermore, local and geographic redundancy ensures reliable network operation and provides automatic network recovery.

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