ViaSat

LinkWay$_{S2}$™
Broadband VSAT System

Innovative IP modem providing
a flexible enterprise infrastructure
with integrated IP QoS

INNOVATIVE AND FLEXIBLE

ViaSat continues to offer the most innovative satellite networking products with its LinkWay$_{S2}$ system, the most advanced full mesh hubless multi-frequency time-division multiple access (MF-TDMA) system. Delivering true network connectivity, the LinkWay$_{S2}$ system seamlessly integrates with your Internet Protocol (IP) based applications, automatically routing your mission critical data via a single satellite hop network using any network topology — mesh, star or hybrid.

Unique in the industry, the full-mesh LinkWay$_{S2}$ MF-TDMA modem has independent fast-hopping transmit and receive paths. The transmit modulator and receive demodulator can each tune on a burst-to-burst basis, independently and automatically, across a 800 MHz frequency range spanning multiple transponders, carrier rates, carrier coding rates, and carrier modulations. This capability allows the most efficient allocation of bandwidth on the network carriers, on any available timeslot on any available carrier frequency, for the most flexible and frequency-agile system available. LinkWay$_{S2}$ modems can be used over any commercial satellite on C, X, Ku, or Ka band using loop-back, split-beam or cross-strapped transponders.

EFFICIENCY

Expanding on the capabilities of the successful LINKWAY® 2100 modem, LinkWay$_{S2}$ modems are more efficient than ever before. The DVB-RCS turbo coding and short preambles provide quasi-error free communications with minimal carrier power requirements and maximum efficiency. The newly added 8PSK modulation feature provides dramatically improved spectral efficiency, while the inclusion of BPSK modulation offers support for ultra-small, sub 1-meter antennas for fixed, at-the-halt or on-the-move communications. LinkWay$_{S2}$ modems offer a unique extended carrier rate range from 312.5 ksps up to an industry-leading 10 Msps. This broad rate range enables system operators to select the optimal carrier rate for their particular network traffic profile allowing greater flexibility for both high-throughput applications, such as streaming video or large media file transfers, as well as low-latency applications, such as voice and video teleconference.

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$_{S2}$ mode requires only an over-the-air software download to remote modems and can be done from a centrally managed location.

LINKWAY$_{S2}$™ AT-A-GLANCE

Features

- MF-TDMA architecture supports any network topology
  - Full-Mesh, Star (hub/spoke), or Hybrid (combination of mesh and star)
- Spread spectrum waveform allows mixed-node networks using ultra-small antennas and on the move terminals coexisting with larger fixed terminals (optional)
- No large, costly VSAT central hub required
- DVB-S2 Integrated Receiver/Decoder (IRD) supports high-speed downloads from any data broadcast site
- Operates on loop-back, split-beam or cross-strapped transponders (C, X, Ku, Ka band)
- Mesh full-duplex IP throughput speeds over 15 Mbps
- Advanced QoS and traffic prioritization options
- New, improved Network Management System (NMS) provides enhanced MF-TDMA burst time plan allocation and map displays
- Local and geographic redundancy of the network controller

Applications

- **Enterprise Connectivity** Enable IP voice, video, or data applications across the enterprise, providing integration of terrestrial and satellite networks and platforms.
- **Cellular Backhaul** Quickly deploy new cell sites to enable connectivity in even the most remote areas of the world.
- **Emergency Response Networks** Connect and help move logistical, rescue and first responder resources in emergencies and disaster areas.
- **Air Traffic Control** Rely on full-mesh communications for voice, radar and messaging traffic between ATC sites.
- **Maritime Networks** Cruise ships, ferries, icebreakers, resource mapping ships, naval vessels.
- **Homeland Security Networks** Transmit data live into border control and checkpoint data systems with transportable terminals.

SPECIFICATIONS

NETWORK CONFIGURATION

Topology	Full-Mesh, Star, and Hybrid
Carrier Symbol Rates	
» **MF-TDMA**	0.3125, 0.625, 1.25, 2.50, 5.00 (optional), 10.00 (optional) Msps
» **TDM (DVB-S2)**	1.0 to 30.0 Msps
Spectral Confinement	
» **MF-TDMA & TDM (DVB-S2)**	α = 0.20
Modulation	
» **MF-TDMA**	BPSK, QPSK, 8PSK
» **TDM (DVB-S2)**	QPSK, 8PSK
Spread Spectrum (optional)	
» **Spread Factors**	1, 2, 4
» **Chip Rates**	1.25, 2.50, 5.00, 10.00 Mcps
FEC	
» **MF-TDMA (DVB-RCS)**	1/3, 1/2, 2/3, 3/4, 4/5, 6/7
» **TDM (DVB-S2)**	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10

INTERFACES

Mesh Tx IF	950 to 1750 MHz, -30 to 0 dBm, Type-F
Mesh Rx IF	950 to 1750 MHz, -75 to -35 dBm, Type-F
DVB-S2 Rx IF	950–2150 MHz, -140 to -90 dBm/Hz
Reference & Power	Software controllable DC power and 10 MHz reference on each IFL interface
User Data Ethernet Port	10/100BaseTx, 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

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% (non-condensing) at 50° C
Storage	0 to 95% (non-condensing) at 70° C
Dimensions (HxWxD)	1.75 x 17.00 x 15.70 in
Weight	7.5 lb

ELECTRICAL

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

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$_{S2}$ modems can utilize this capability with any standard EN 302 307 DVB-S2 modulator and IP encapsulator.

NETWORK MANAGEMENT

LinkWay$_{S2}$ based terminals are controlled by a full-featured Network Control Center (NCC) management station. The 1 rack-unit NCC server connects to any standard LinkWay$_{S2}$ 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. Local and geographic redundancy ensures reliable network operation and provides automatic network recovery.

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$_{S2}$ modems, using ultra-small antennas typically used in OTM platforms.

CONTACT

SALES
TEL +1.678.924.2880 **FAX** +1.678.924.2480
EMAIL vsatsales@viasat.com
WEB www.viasat.com

ATLANTA 1725 Breckinridge Plaza, Duluth, GA 30096 **TEL** +1.678.924.2400 **FAX** +1.678.924.2480
BEIJING Lucky Tower Block B, Suite 1112, No. 3 Dong San Huan Bei Lu, Beijing 100027, China **TEL** +86.10.6461.5761 **FAX** +86.10.6461.5754
NEW DELHI 601 New Delhi 611-A, JMD Pacific Square Sector 15, Part 2, NH #8 Gurgaon 122001 Haryana, India **TEL** +91.124.402.5200 **FAX** +91.124.402.5252
ROME Piazza del Popolo 18, 00187 Rome, Italy **TEL** +39.0636712432 **FAX** +39.0636712400
SAN DIEGO 6155 El Camino Real, Carlsbad, CA 92009 **TEL** +1.760.476.2200 **FAX** +1.760.929.3941
SYDNEY Unit 4/22 Narabang Way Belrose, NSW 2085, Australia **TEL** +61.2.9986.3888 **FAX** +61.2.9986.3899