Hughes HX280
Mesh/Star Broadband Router

High-performance IP satellite router with enhanced security

The HX280 is a commercial off-the-shelf (COTS), high-performance satellite router that builds on the successful HX260 mesh/star product, enabling carrier-grade broadband Internet Protocol (IP) services with enhanced security and on-the-move (OTM) capabilities. Ideal for commercial and government/military applications, the HX280 has integrated AES256-based Federal Information Processing Standards (FIPS) 140-2 cryptographic security. It also supports the HX System Enhanced Signaling Security feature, which protects all data, management, and signaling traffic over the satellite network. These security enhancements build on the high Quality of Service (QoS) features of the HX System, including adaptive, Constant Bit Rate (CBR) bandwidth assignment that enables efficient delivery of low jitter, real-time applications, such as Voice over IP (VoIP) and videoconferencing.

With integrated IP features including RIPv1, RIPv2, BGP, DHCP, NAT/PAT, and DNS Server/Relay functionality in a compact, high-performance router package, the HX280 is the ideal platform to configure any combination of mesh and star topologies for highly secure, broadband IP networks. In particular, simultaneous mesh and star operation of the HX280 yields the most bandwidth-efficient solution possible when combining VoIP services on a per-call basis with continuous, high-speed data services such as Internet access.

Target Markets

- Government and military satellite networks
- Star/mesh voice/data broadband IP connections
- Satellite on-the-move platforms: land mobile, maritime, and airborne
- GSM backhaul, SCPC/MCPC replacement links
- MPLS extension services
- Embassy and government networks
- Air traffic control
- Virtual Private Networks (VPN), leased-line services

HX System Architecture

The HX System is fully compliant with the IPoS/DVB-S2 satellite standard, including adaptive coding and modulation (ACM), the world's leading standard approved by TIA, ETSI, and ITU. Its architecture consists of a central HX Gateway connecting to multiple HX remote terminals. The outbound channel from the central gateway is continuously received by every HX remote terminal in the system—and this reception is independent of the mesh connection status of any given terminal. The connectivity from a remote terminal to either the HX Gateway or other HX280 terminals is via TDMA links. Efficiency and flexibility in utilizing satellite bandwidth are at the core of the HX280 design. Each TDMA link, whether in star or mesh mode, can be configured to provide a QoS tailored to the requirements of each link. This includes such capabilities as defining a minimum Committed Information Rate (CIR) and maximum rate, thereby enabling service providers to develop services tailored to customer-specific requirements. In addition, the HX System bandwidth allocation scheme uses an Aloha channel for initial traffic requests (and only initial traffic requests), which means that terminals are able to release all TDMA channel assignments when they are idle. This frees up unused bandwidth and allows operators to make more efficient use of space segment resources.

The HX System from Hughes, the world leader in broadband satellite networks and services, is designed and optimized for smaller and mobile networks, including maritime and airborne applications, where the provision of high-quality and high-bandwidth links is paramount. Capable of simultaneous mesh, star, and multi-star configurations, the HX System builds upon the capabilities and global success of the high-performance HN System, incorporating many advanced features pioneered by Hughes, including integrated TCP acceleration and advanced IP networking. Its broadband satellite products are based on global standards approved by TIA, ETSI, and ITU, including IPoS/DVB-S2, RSM-A, and GMR-1. To date, Hughes has shipped more than 2.2 million satellite terminals to customers in over 100 countries.

Features

- Simultaneous Star/Mesh
- Mobility Features:
  - Doppler compensation for speeds up to 600 mph (960 kph) for airborne links
  - Selective TDMA channel spreading for regulatory compliance of small aperture on-the-move (OTM) or manpack terminals
  - NMEA GPS input through serial interface
  - Mute transmit input for antenna mispointing
  - External 10 MHz input for High Stability References
  - Beam-to-beam automatic switching
- Security Features:
  - FIPS 140-2 Level 2 compliant
  - Tamper-evident seals
  - IPSec capability to use HMAC-SHA-256 authentication
  - Implements Enhanced Signaling Security feature protecting management, control, and data with AES-256 encryption
- Quality of Service features include:
  - On-demand constant bit rate (CBR) services
  - Adaptive CBR with Min CIR with max rate
  - Backlog-based dynamic stream with weighted fair queuing
  - Class-based weighted prioritization
  - Multicast data delivery
  - Four levels of IP traffic prioritization
- Bandwidth management
  - Supports both pre-assigned (static) traffic assignment and dynamic traffic assignment
  - Idle terminals can be configured to release all network resources
- Acts as a local router providing:
  - Static and dynamic addressing
  - DHCP server or relay
  - DNS caching
  - RIPV1, RIPV2, BGP routing support
  - Multicasts to the LAN by using IGMP
  - NAT/PAT
  - VRRP
  - VLAN tagging
  - Firewall support through integrated access control lists
- Supports unicast and multicast IP traffic
- Software and configuration updates via download from the HX Gateway

Technical Specifications

Physical Interfaces

Two 10/100BaseT Ethernet LAN RJ45 Ports

One Serial Port (RS-422 or RS-232)

Satellite Specifications

Frequency	C-, Extended C-, Ku-, Ka-band
DVB-S2 ACM Channel	DVB-S2 with Adaptive Coding and Modulation or DVB-S
DVB-S2 ACM Rate	1-45 Msps (in 0.5 Msps steps)
DVB-S2 ACM Modulation	QPSK, 8PSK, 16APSK (Adaptive Modulation)
DVB-S2 ACM Coding	BCH with LDPC 3/5, 1/2, 2/3, 3/4, 5/6, 8/9, 9/10 (Adaptive Coding)
FDMA/TDMA (IPoS) Channel Rate	256 to 6144 ksps (256 kbps to 9.8 Mbps)
FDMA/TDMA (IPoS) Channel Coding	1/2, 2/3, 4/5 with TurboCode Rate (Adaptive Coding)
FDMA/TDMA (IPoS) Channel Modulation	OPQSK
FDMA/TDMA (IPoS) Mesh Receivers	4 simultaneous TDMA receivers
Bit Error Rate (Receive)	10^{-10} or better
Bit Error Rate (Transmit)	10^{-7} or better
Interface to ODU	Industry standard BUC (L-band) or Hughes proprietary BUC

HX280 Mechanical and Environmental

1U rack mount unit for 19" rack

Weight	5.5 lbs. (2.5 kg)
Dimensions	19" W x 1.75" H x 14" D (48.26 cm W x 4.45 cm H x 35.6 cm D)
Operating Temperature:	32° F (0° C) to 122° F (50° C)

- Implements dynamic, self-tuning Performance Enhancement Proxy (PEP) software to accelerate the throughput performance by optimizing the TCP transmission over the satellite, delivering superior user experience and link efficiency (star operation only)
- Mesh connections are supported for TCP and UDP traffic without PEP
- Bidirectional data compression (star only)
- Configuration, status monitoring, and commissioning via the NOC
- Embedded Web interface for local status and troubleshooting
- Remote terminal management via the Hughes Unified Element Manager and SNMP agent
- User-friendly LED display indicating terminal operational status
- Embedded temperature sensor

For additional information, please contact us at globalsales@hns.com or visit our Web site at www.hughes.com.

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H41103 ID

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