

# Hughes HX260 Mesh/Star Broadband Router



## Mesh/star high-performance IP satellite router

The HX260 is a high performance satellite router designed to support dynamically assigned high-bandwidth IP connectivity in simultaneous mesh and star operation. The HX260 satellite router provides high Quality of Service (QoS) features including adaptive Constant Bit Rate (CBR) bandwidth assignment that delivers high-quality low jitter bandwidth for real-time traffic such as VoIP (Voice over IP) or videoconferencing. With integrated IP features including RIPv1, RIPv2, BGP, DHCP, NAT/PAT, and DNS Server/Relay functionality, together with a high-performance satellite router, the HX260 is the ideal platform for supporting mesh and star broadband IP connectivity. In addition, with the ability to support simultaneous mesh and star operation, the HX260 is ideal for applications such as VoIP services where simultaneous mesh connections are required on a per call basis and, at the same time, continuous Internet access is demanded.

### Target Markets

- Star/mesh voice/data broadband IP connections
- GSM backhaul, SCPC/MCPC replacement links
- MPLS extension services
- Embassy and government networks
- Air traffic control
- Private, leased-line services

### HX260 Benefits

- Simultaneous star/mesh capability
- Single-hop telephony or videoconferencing
- Support for distributed star networks



### HX System Architecture

The HX System is a DVB-S2 ACM/IPoS with Adaptive Coding Modulation (ACM) system consisting of a central Gateway connecting to multiple HX routers. The outbound channel from the central Gateway, which utilizes DVB-S2/ACM, is continuously received by every HX router in the system—this reception is independent of mesh connections between routers. The TDMA channels of the HX System are highly efficient and are based on the industry leading standard, IPoS. The connectivity from a router to either the HX Gateway or other HX260 routers is through the TDMA channels.

Efficiency and flexibility in utilizing satellite bandwidth are at the core of the HX260 design. Each TDMA link, whether in star or mesh mode, can be configured to provide QoS tailored for the requirements of each link. This includes such capabilities as defining a minimum, guaranteed and maximum Committed Information Rate (CIR), CBR (adaptive and on-demand) and Best Effort, thereby allowing service providers to develop a service tailored to its customers' specific requirements. In addition, the HX System bandwidth allocation scheme uses an Aloha channel for initial traffic requests (and only the initial traffic request), which means that routers are able to release all TDMA channel assignments when they are idle. This frees up unused bandwidth and allows an operator 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
- Quality of Service features include:
  - On-demand Constant Bit Rate (CBR) services
  - Adaptive CBR with Min, Max, and user-definable step sizes
  - CIR with Min, Guaranteed, and Max rates
  - 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 preassigned (static) traffic assignment and dynamic traffic assignment
  - Idle remotes 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 and from 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
- 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
- Mesh connections are supported for TCP and UDP traffic
- Bidirectional data compression
- Configuration, status monitoring, and commissioning via the HX Gateway
- Embedded Web interface for local status and troubleshooting
- Satellite router management via the Hughes Unified Element Manager and SNMP agents
- User-friendly LED display indicating router operational status

## Technical Specifications

### Physical Interfaces

Two 10/100BaseT Ethernet LAN RJ-45 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 kbps (256 kbps to 9.8 Mbps)
FDMA/TDMA (IPoS) Channel Coding Rate	1/2, 2/3, 4/5 with TurboCode (Adaptive Coding)
FDMA/TDMA(IPoS) Channel Modulation	OQPSK
Bit Error Rate (Receive)	10 <sup>-10</sup> or better
Bit Error Rate (Transmit)	10 <sup>-7</sup> or better
Interface to ODU	Industry standard BUC (L-Band) or Hughes proprietary BUC

### HX260 Mechanical and Environmental

1U rack mount unit for 19" rack	
Weight	6 lbs
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)
FDMA/TDMA (IPoS) Mesh Receivers	4 Simultaneous Receivers



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