



## Scalable broadband satellite system for smaller networks

The HN NOC<sub>CX</sub> is the ideal Network Operations Center solution for service providers and enterprises with smaller initial network requirements, yet is easily expandable as service demand justifies. Like its large network counterpart, the HN NOC<sub>LX</sub>, the CX version is unsurpassed in flexibility and scalability.

A highly efficient architecture incorporates numerous advanced features, including guaranteed quality of service levels for inroute bandwidth and industry-leading acceleration and compression technologies.

The HN NOC<sub>CX</sub> comes in a compact and efficient single-rack package based on the same architecture as the full-sized HN NOC<sub>LX</sub>, only optimized for smaller networks. With the addition of an expansion rack, the HN NOC<sub>CX</sub> can be scaled to support the entire suite of broadband services for very large networks.

The HN satellite broadband infrastructure is the most advanced and widely deployed system worldwide, with over one million terminals shipped to customers in over 100 countries. Compliant with the IPoS global standard and optimized for high-speed IP connectivity over

satellite, all HN networks support a wide and growing range of multimedia, video, data, and voice applications.

### HN NOC<sub>CX</sub> Architecture

The HN NOC<sub>CX</sub> architecture is highly modular and scalable, and enables rapid provisioning of a range of satellite broadband services from a single, comprehensive platform. Addition of an expansion rack enables the HN NOC<sub>CX</sub> to be easily expanded as network demand justifies.

Efficiency and flexibility in utilizing satellite bandwidth is at the core of its design. For example, one or more terminals can be selected for guaranteed inroute bandwidth, while the remaining terminals share fair access via a truly dynamic bandwidth assignment algorithm. The HN NOC<sub>CX</sub> supports outbound data rates up to 121 Mbps and aggregate inbound data rates up to 26 Mbps.

It is this flexibility, efficiency, and high quality of service that has earned the HN broadband systems the reputation as simply the best technology available on the market.



HughesNet encompasses all broadband solutions and managed services from HUGHES, for large enterprises, governments, small businesses and consumers. HughesNet solutions and services are marketed directly by Hughes and its authorized resellers and distributors throughout North America, Europe, India and Brazil. In all other regions of the world, Hughes

products and services are available from a growing family of value-added providers and resellers. Hughes satellite products are based on the IPoS (IP over Satellite) global standard approved by TIA, ETSI, and ITU.

## Features

### HN NOC<sub>CX</sub> Features

- Intelligent, protocol-sensitive bandwidth assignment for optimum performance and efficiency for each application
- Dynamically assigned inroute Committed Information Rate (CIR) per single/group of terminals
- Efficiently engineered IP transport that supports data, as well as real-time applications with equal ease
- Unique network security with integrated outbound encryption and conditional access
- Comprehensive network management system that is used to both configure and manage the NOC and remote terminals
- Active redundancy for all critical components ensures high availability
- Highly modular, single-rack design provides scalability and enables rapid deployment

### Services Supported

- Broadband Internet access
- Private IP network for corporate intranets
- Multicast data delivery
- Multimedia applications including MPEG4 video and DVR capabilities
- VoIP telephony
- Serial protocols including SDLC, X.25, and async services

Note: Some services mentioned above require the expansion rack for full support.

### The IPoS Advantage

The entire HN family of satellite terminals and routers is compliant with the global IPoS (IP over Satellite) standard. IPoS enables the HN broadband system to provide superior inroute performance and efficiency.

- Clearly defined interface conforming to the ETSI SI-SAP standard enabling back-end systems to work easily with the HN infrastructure
- Truly dynamic bandwidth assignment—remote sites with no traffic are assigned no resources
- Inroute Quality of Service—Committed Information Rates (CIR) per active remote terminal or group of terminals
- Operation in the saturated region leading to better cost efficiency
- Finer inroute granularity allowing a lower average burst overhead, thereby increasing efficiency

## System Technical Specifications

### ■ Outbound Channel

DVB-S or DVB-S2 (optional) compliant

Frequency:	C-, Extended C-, Ku-, Ka-band
Modulation:	QPSK or 8PSK (DVB-S2)
Symbol Rates:	1, 1.25, 2.5, 5-45 Msps (in steps of 1Msps)
DVB-S Encoding:	Convolutional with concatenated Reed Solomon Viterbi $7/8$ , $5/6$ , $3/4$ , $2/3$ , or $1/2$
DVB-S2 Encoding:	LDPC with BCH outer code, ACM capable. Rates $1/2$ , $2/3$ , $3/4$ , $5/6$ , $7/8$ , $8/9$ , $9/10$ .
Bit Error Rate:	$10^{-10}$ or better

### ■ Inbound Channel

Transmit modulation:	OQPSK
Transmit encoding:	Rate $1/2$ , $2/3$ , $4/5$ TurboCode, Rate $1/2$ Convolutional
Transmit bit rates:	128 kbps - 1.6 Mbps

### ■ Size & Scalability

Base Configuration:	Single 45U rack
	Supports up to 1,000 terminals
	Supports up to 16 inbound channels
Expansion Rack:	Additional 45U rack
	Scalable to several thousand terminals
	Supports up to 16 additional inbound channels

### ■ Security

Integrated Conditional Access and DES encryption of outbound channel.

### ■ Network Management System

Hughes Vision® NMS

### ■ Remote Terminals & Appliances Supported

DW7000 Series  
HN7000S Series  
Voice Appliance  
Serial Appliance

### Hughes Acceleration Techniques

- Advanced techniques including TCP spoofing, ACK reduction, and flow control, accelerate TCP traffic using Hughes proprietary Performance Enhancement Proxy (PEP)
- Advanced compression algorithms including stateful compression, significantly improve compression ratios and resulting throughput
- DNS caching eliminates satellite latency introduced by DNS lookup queries

For additional information, please contact us at [globalsales@hns.com](mailto:globalsales@hns.com).

[www.hughes.com](http://www.hughes.com)