H8 & H16 Heights™ Remote Gateways

Datasheet

Overview

The Heights™ Networking Platform is engineered to elevate your services with unparalleled horsepower, efficiency and intelligence. The features within the platform were designed with the service provider and its multi-tenant environments in mind, from concept to operation,

Heights combines our most efficient waveforms, header and payload compression engines, WAN optimization, proven dynamic bandwidth and power management along with bi-directional ACM capability to provide the highest user throughput, highest availability, and most optimal resource utilization available in the industry.

Heights meets the demands of those operating on traditional wide beams while providing distinct advantages for those with High Throughput Satellites (HTS) in their future. Heights is HTS ready, allowing service providers to leverage the significant increases in performance these new designs will offer for inbound links.

Purpose-built to unleash the potential of these tight spot beams, Heights remote gateways provide the strongest processing performance, maximizing user IP bits per Hz while realizing significant gains in user IP bits per Amplifier (BUC) Watt.

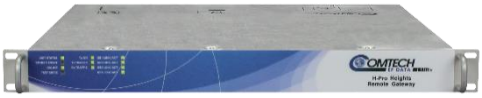
There are multiple remote gateway options that support Dynamic SCPC (dSCPC) depending upon the performance needs of each site within your network. All remote options are able to interoperate within the same network and are equipped with all features enabled upon initial site rollout. All future features are made available to customers with an Engineering Support Services contract.

Typical Users

- Oil & Gas
- Cruise and Cargo
- Corporate Enterprise
- Service Provider Multi-Tenant Environments
- Non-Governmental Organization (NGO)
- Mobile Network Operators
- Media
- Government

Common Applications

- Maritime, Offshore & Mobility Communications
- Latency sensitive Business Applications
- IP Trunking & Internet Access
- Mobile Backhaul
- Satellite News Gathering
- Content Distribution Networks

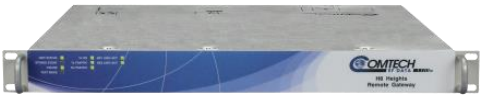


H-Pro – High Throughput, for H-DNA or Dynamic SCPC mode of operation (See H-Pro Datasheet for details)

- Replaces H-64 and H-32 Remote Gateways

H16 Remote Gateway – Medium Throughput, for Dynamic SCPC mode of operation, upgradable to H-DNA

- Receives up to 60 Mbps user IP data
- Transmits up to 16 Mbps user IP data



H8 Remote Gateway – Low to Medium Throughput, for Dynamic SCPC mode of operation, upgradable to H-DNA

- Receives up to 30 Mbps user IP data
- Transmits up to 8 Mbps user IP data

Heights Dynamic Network Access (H-DNA)

H-DNA is an evolutionary dynamic network access technology designed for Heights return links that:

- Rapidly adapts to changing environments
- Delivers superior efficiency & Quality of Experience (QoE)
- Instantly assigns capacity based on network-wide demand
- Intelligently utilizes total network bandwidth at all times

H-DNA is designed to provide network wide fast switching on a sub-second interval making the process seamless and transparent to end users for real-time as well as non real-time applications. H-DNA leverages Comtech's high performance VersaFEC-2 waveforms with ACM, dynamic power control, high performance packet processing, network wide multi-tier QoS and IP optimization technology to enable unprecedented bandwidth efficiency and superior QoE. H-DNA fast switching and bandwidth allocation mechanism allows a Heights network to respond rapidly to changing traffic and link conditions while maintaining lowest latency and jitter for superior QoE and maximum bandwidth utilization efficiency.

H-DNA is fast, flexible and uncompromising, delivering unprecedented benefits to users and service providers alike.

Unparalleled Remote Horsepower

Each Remote Gateway provides unprecedented processing power with all multi-layer optimization features enabled on the device. The performance levels enable the Heights remote gateway suite to support the most demanding of multimedia traffic mixes in a single unit and provide the headroom required to leverage new HTS spacecraft designs. The increased G/T performance of these new spacecraft allow for significantly more throughput to be transmitted in the inbound direction, in terms of Mbps. However, this increased Mbps cannot be met if the underlying packet processing is not able to keep up with traffic flow. Our remote gateways all have the underlying processing power to enable service providers to take full advantage of the potential of these new HTS designs and grow service levels as end users' demands grow.

Seamless Bridge Point-to-Multipoint (BPM) Operation

The Heights Networking Platform operates in BPM mode to provide true layer 2 operation. From the remote perspective, the entire Heights network is viewed as an Ethernet switch while benefiting from a bi-directional multi-level QoS with VLAN ID classification.

Global IP Roaming

Global IP roaming enables a satellite terminal on-board a mobile platform to seamlessly transition between satellite beams or hub coverage with minimal service interruption. Each remote gateway includes an embedded mobility controller that interfaces with the Antenna Control Unit (ACU), maintains satellite footprint maps and initiates beam switching and handoff as the vessel moves through the satellite footprint. It offers a common management interface for the mobility server and the ACU by providing a set of commands, information, interfaces and status queries.

Dynamic MESH

Heights supports dynamic remote-to-remote connections (MESH) in router mode with dSCPC, using additional receivers at the remote. Dynamic MESH requires "loop-back" operation where each site in a MESH connection is able to receive from all other sites in that MESH connection. Dynamic MESH eliminates double hop latency as remote-to-remote packets don't have to transit through the hub. It also requires 50% less bandwidth as a remote-to-remote double hop link would consume almost twice the bandwidth.

WAN Optimization

Heights Remote Gateways incorporate embedded WAN optimization. WAN optimization includes TCP / http acceleration, persistent TCP connections, image smoothing, DNS caching and object caching and significantly improves user's web browsing experience over higher latency satellite links while reducing the amount of required bandwidth. It also enables web and other TCP applications to fully utilize all available bandwidth. WAN optimization requires FX-4010C Application Delivery Controller (ADC) at the hub. WAN optimization is fully integrated with multi-tier QoS, ACM and IP optimization for maximum performance and efficiency.

Benefits

- High throughput capabilities support increasing end user traffic demands without upgrades or site visits
- Flexible remote gateways can operate on both traditional wide and new HTS designs
- Future-proof design allows remote gateways to take advantage of significant throughput increase potential of new HTS designs
- Remote gateway horsepower allows maximum user IP bits per Amplifier (BUC) Watt to be achieved
- Seamless Bridge Point-to-Multipoint (BPM) Operation provides traffic separation for remote multi-tenant environments
- On-board Global IP roaming functionality allows each remote to make individual beam transition decisions
- Multi-layer optimization delivers the highest user IP bits per Hz, minimizing Total Cost of Ownership (TCO) over network life

Specifications

Packets per Second	**H64 / H32**	**H16**	**H8**
Aggregate PPS (TX+RX)*	Replaced by H-Pro	Up to 70,000	Up to 70,000

* PPS is measured at 2:1 ratio RX:TX

Transmit	**H64 / H32**	**H16**	**H8**
TX Symbol Rate	Replaced by H-Pro	39 ksps – 5 Msps*	39 ksps – 2.5 Msps*
TX WAN Rate		Up to 10 Mbps	Up to 5 Mbps
TX User IP Throughput		Up to 16 Mbps	Up to 8 Mbps
FEC		VersaFEC-2	VersaFEC-2
Modulation	BPSK, QPSK, 8-ARY, 16-ARY, 32-ARY		
Transmit Filter Rolloff	5%, 10%, 15%, 20%, 25%, 35%		
Return ACM	Yes		

* Minimum symbol rate is 39 ksps for BPSK/QPSK, 60 ksps for 8-ARY, 100 ksps for 16-ARY and 250 ksps for 32-ARY modulation.

Receive	**H64 / H32**	**H16**	**H8**
RX Symbol Rate	Replaced by H-Pro	1 – 150 Msps	1 – 150 Msps
RX User IP Throughput / Terminal		Up to 60 Mbps	Up to 30 Mbps
FEC		Comtech Efficiency Boost (EB)	Comtech Efficiency Boost (EB)
Demodulation	QPSK, 8PSK, 16APSK, 32APSK		
Filter Rolloff	5%, 10%, 15%, 20%, 25%, 35%		
Outbound ACM	Yes		

Gigabit Ethernet Traffic Port	**H64 / H32**	**H16**	**H8**
Traffic Ports	Replaced by H-Pro	4	2

Modulator Specifications

Operating Frequency	950 to 2150 MHz L-Band, 100 Hz frequency resolution
Frequency Stability	± 0.06 ppm (± 6 x 10-8), 0 to 50°C (32 to 122°F)
Frequency Reference	Internal
Harmonics and Spurious	Better than -55 dBc/4 kHz (typically < -60 dBc/4KHz) Measured from Fo +/- 300 MHz
BUC Reference (10 MHz)	Via TX IF center conductor, 10.0 MHz ± 0.06 ppm, selectable on/off, 0.0 dBm ± 3 dB
BUC Power Supply (HW Option)	24 VDC, 4.17 Amps max., 90 W @ 50°C 48 VDC, 3.125 Amps max., 150 W @ 50°C Supplied through TX IF center conductor and selectable on/off via M&C control

Demodulator Specifications

Operating Frequency	950 to 2150 MHz L-Band, 100 Hz frequency resolution
Input Power Range, Desired Carrier	-60 dBm + 10 log (symbol rate in Msps) to -25 dBm
Absolute Maximum, No Damage	-10 dBm
Acquisition Range	+/- 100 kHz
Adaptive Equalizer	Corrects up to 3 dB tilt
LNB Reference (10 MHz)	Via RX IF center conductor, 10.0 MHz ± 0.06 ppm Selectable on/off, -3.0 dBm ± 3 dB
LNB Voltage	Selectable on/off, 13 VDC, 18 VDC
LNB Current	500 mA, maximum
Monitor Functions	Es/No estimate, receive signal level, frequency offset

Physical, Power & Environmental

Dimensions (1RU) (height x width x depth)	1.75” x 19.0” x 16.1” (4.4 x 48 x 40.8 cm) approximate
Power Supply	100-240 VAC, 47Hz-63Hz IEC 320 input 48 VDC (HW option)
Operating Temperature	0 to 50°C
Storage temperature	-40 to 85°C
Humidity	95% maximum, non-condensing

Hardware Options

- 48 VDC, Primary Power Supply
- 24 VDC, 90 W @ 50°C BUC Power Supply
- 48 VDC, 150 W @ 50°C BUC Power Supply

See Comtech EF Data’s Patents and Patents Pending at http://patents.comtechefdata.com

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