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, 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.

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

There are four remote gateway options to choose from, 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.

The four remote gateway options are:
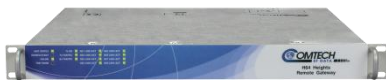
H64 Remote Gateway – High Throughput
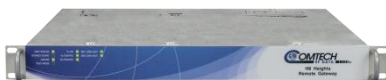- Receives up to 150 Mbps user IP data
- Transmits up to 64 Mbps user IP data

H32 Remote Gateway – Medium to High Throughput
- Receives up to 120 Mbps user IP data
- Transmits up to 32 Mbps user IP data

H16 Remote Gateway – Medium Throughput
- Receives up to 60 Mbps user IP data
- Transmits up to 16 Mbps user IP data

H8 Remote Gateway – Low to Medium Throughput
- Receives up to 30 Mbps user IP data
- Transmits up to 8 Mbps user IP data

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 works with a mobility server that functions as the onboard mobility controller. It interfaces to 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, using additional receivers at the remote. 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.
* Available in future software release.

TCP Acceleration*

Heights remote gateways can work with the FX TCP acceleration device to overcome the limitations of TCP when operating over high latency links. It improves user quality of experience by speeding up web surfing and TCP based data transfer. It also enables web and other TCP applications to fully utilize all available bandwidth. TCP acceleration requires FX-4010 at the hub. TCP acceleration 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)*	50,000*	,50,000*	50,000*	50,000

* Future release will support up to 140,000 PPS for H64 / 105,000 PPS for H32 / 70,000 PPS for H16

Transmit	H64	H32	H16	H8
User IP Throughput	Up to 64 Mbps	Up to 32 Mbps	Up to 16 Mbps	Up to 8 Mbps
Symbol Rate	16 ksps – 15 Msps*	16 ksps – 10 Msps*	16 ksps – 5 Msps*	16 ksps – 2.5 Msps*
WAN Rate (Optimized)	16 kbps – 40 Mbps	16 kbps – 20 Mbps	16 kbps – 10 Mbps	16 kbps – 5 Mbps
FEC	VersaFEC-2 High Rate (HR) VersaFEC-2	VersaFEC-2 High Rate (HR) VersaFEC-2	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 37 ksps for 8-ary, 16-ary and 32-ary modulation.

Receive	H64	H32	H16	H8
User IP Throughput / Terminal	Up to 150 Mbps	Up to 120 Mbps	Up to 60 Mbps	Up to 30 Mbps
Symbol Rate*	1 – 36 Msps	1 – 36 Msps	1 – 36 Msps	1 – 36 Msps
FEC	Comtech Efficiency Boost (EB)	Comtech Efficiency Boost (EB)	Comtech Efficiency Boost (EB)	Comtech Efficiency Boost (EB)
Demodulation	QPSK, 8PSK, 16APSK, 32APSK			
Filter Rolloff	5%, 10%, 15%, 20%, 25%, 35%			
Outbound ACM	Yes			

* Future release will support up to 150 Msps

Gigabit Ethernet Traffic Port	H64	H32	H16	H8
Traffic Ports	8	8	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 MHz) 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	–20 to 70°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