H-Plus Heights™ Remote Gateway

Datasheet

Typical Users

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

Common Applications

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

Overview

The Heights™ Networking Platform is engineered to elevate your services with unparalleled horsepower, efficiency and intelligence. The Heights platform was designed with the service provider and its multi-user 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.

The H-Plus Remote Gateway is a dual-purpose modem. The H-Plus can be used as a Point-to-Point SCPC modem or can be purposed as a mid-tier Heights Remote Gateway. It is capable of providing high-performance for low to medium capacity sites at an attractive CAPEX. It supports multiple transmit throughput tiers up to 10 Mbps, which is managed via centralized licensing capability for ease of use. This scheme allows users to standardize on a single remote platform for low to medium capacity sites, simplifying stocking and sparing.

Heights Dynamic Network Access (H-DNA / Heights Mode Only)

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.

SCPC Mode of Operation

The H-Plus can be used as a Heights Remote Gateway or a true SCPC point-to-point modem and is interoperable with another H-Plus or Comtech's award-winning SCPC modems such as the CDM-625A and CDM-425 modems. This is very beneficial for users who anticipate growing their network or need more flexibility or don't have access to a Heights Hub.

- Start a smaller SCPC network and transition to Heights; re-purpose all existing SCPC modems and retain your investment
- Transition to Heights without having to re-visit remote sites (over the air conversion to/from SCPC & Heights)
- Transition from Heights to SCPC in a mobility environment where a Heights Hub may not be available or financially practical

Unparalleled Remote Horsepower

H-Plus incorporates unparalleled processing power enabling high efficiency and throughput with multi-layer optimization. The increased EIRP and G/T performance of new HTS spacecraft allows for significantly higher throughput. However, this increased throughput cannot be met if the underlying packet processing is not able to keep up with the increased traffic flow. The quad-core processor in H-Plus can support the most demanding user applications in a HTS environment enabling service providers to take full advantage of the potential of these new HTS designs and grow service levels as end users' demands grow.

WAN Optimization and GPRS Tunneling Protocol (GTP) Mobile User Data Traffic Optimization (Heights Mode Only)

Heights Remote Gateways incorporate embedded WAN optimization for Internet Traffic and GTP traffic Optimization.
GTP is used in mobile networks on 3G IuPS, 3G IuH and LTE S1 interfaces. Mobile subscriber traffic is encapsulated within an IP/UDP/GTP tunnel. Heights remote incorporate embedded GTP traffic optimization which allows for optimization of the mobile subscriber traffic within the GTP tunnel, improving user Quality of Experience (QoE) through greater throughput and faster response time, and rendering the Mobile Network more efficient.

Heights WAN and GTP optimization provide TCP acceleration, based on Comtech's patented TurboStream Performance Enhancement Protocol (PEP). TurboStream mitigates TCP performance issues across long delay links through intelligent implementations of scalable WAN TCP windows, and traffic multiplexing of LAN TCP sessions into persistent WAN TCP sessions. This process greatly reduces "time to first byte", which means that the traffic starts flowing much faster than it would otherwise, and also enables traffic to ramp up to levels which would not be otherwise possible over long latency VSAT links.

Heights WAN and GTP optimization incorporate remote DNS caching enabling remote users' web browsers to quickly resolve Host names to IP addresses locally, once again speeding up the "time to first byte". Without local DNS caching, all DNS inquiries would have to traverse the VSAT link leading to longer delays before traffic starts actually flowing.

Heights WAN and GTP optimization also support image smoothing, thereby reducing the amount of data that needs to traverse the satellite link. Image smoothing also speeds up the time to download the webpages.

WAN and GTP optimization requires the FX Series at the hub. WAN optimization and GTP optimization is fully integrated with network wide multi-tier QoS, ACM and IP optimization for maximum performance and efficiency.

Seamless Bridge Point-to-Multipoint (BPM) Mode or Routed Mode (Heights Mode Only)

In addition to routed mode, the Heights Networking Platform supports BPM mode for true layer 2 operation enabling seamless integration with service provider network. A Heights network operating in BPM mode can be viewed as an Ethernet switch supporting VLAN and MPLS while benefiting from bi-directional IP optimization, network wide multi-tier QoS, ACM and dynamic bandwidth management. H-Plus includes extensive VLAN support including VLAN Access mode, trunk mode and QinQ. In BPM mode, H-Plus supports traffic classification and QoS by VLAN ID as well as MPLS Traffic Class Field (formerly referred to as EXP bits).

Global IP Roaming (Heights Mode Only)

An embedded mobility controller in H-Plus enables a satellite terminal on-board a mobile platform to seamlessly transition between satellite beams or hub coverage with minimal service interruption. The embedded mobility controller 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.

Benefits

- High throughput capabilities support increasing end user traffic demands
- Multiple throughput tiers managed by centralized software licensing simplify stocking and sparing
- Future-proof design allows remote gateways to take advantage of significant throughput increase potential of new HTS designs
- High performance waveforms combined with multi-layer optimization delivers the highest user IP bits per Hz, as well as highest user IP bits per Amplifier (BUC) Watt, minimizing Total Cost of Ownership (TCO) over network life
- Seamless Bridge Point-to-Multipoint (BPM) mode provides seamless integration with service provider network
- Extensive VLAN support enabling traffic separation for multi-user environments
- GTP and WAN Optimization improves user experience for web applications while saving bandwidth
- Embedded mobility controller enables global roaming

Heights Mode Specifications

Transmit

Data Rate Tiers	Up to 40 Mbps (Software license centrally managed)
Symbol Rate	Up to 15 Msps Minimum symbol rate is 42.3 ksps for BPSK/QPSK, 60 ksps for 8-ARY, 100 ksps for 16-ARY, 250 ksps for 32-ARY modulation
FEC	VersaFEC-2
Modulation	BPSK, QPSK, 8-ARY, 16-ARY, 32-ARY
Transmit Filter Rolloff	5%, 10%, 15%, 20%, 25%, 35%
Return ACM	Yes

Receive

Data Rate	Up to 100 Mbps to a single H-Plus remote
Symbol Rate	1 – 150 Msps (shared outbound)
FEC	DVB-S2X & Comtech Efficiency Boost (EB)
Demodulation	QPSK, 8PSK, 16APSK, 32APSK, 64APSK, 128APSK, 256APSK
Filter Rolloff	5%, 10%, 15%, 20%, 25%, 35%
Outbound ACM	Yes

Packets per Second Aggregate PPS (TX+RX)	> 35,000
Gigabit Ethernet Traffic Port	4

TCP and TCP within GTP Acceleration (Option)

Accelerated Sessions	5,000 Accelerated Sessions (all sessions over 5,000 will be passed without being accelerated)

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, 47 Hz-63 Hz 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

Software Options

- FAST SCPC Mode Operation
- FAST WANOp GTP Acceleration
- FAST VersaFEC-2 Codec Symbol Rate (ACM) – 1,200 ksps, 2,000 ksps, 4,100 ksps, 8,000 ksps
- WANOp, WANOp GTP, Header and Payload Compression are available in Heights mode

SCPC Specifications

Transmit

Data Rate	VersaFEC-2: 41.4 kbps to 10 Mbps DVB-S2X: 480 kbps to 130 Mbps (Software Licensed)
Symbol Rate	VersaFEC-2: Up to 8 Msps Minimum symbol rate is 42.3 ksps for BPSK/QPSK, 60 ksps for 8-ARY, 100 ksps for 16-ARY, 250 ksps for 32-ARY modulation DVB-S2X: 1 Msps – 30 Msps for all MODCODs
FEC	VersaFEC-2 & DVB-S2X
Modulation	VersaFEC-2: BPSK, QPSK, 8-ARY, 16-ARY,32-ARY DVBS2X: QPSK, 8PSK, 16APSK, 32APSK, 64APSK, 128APSK, 256APSK
Transmit Filter Rolloff	5%, 10%, 15%, 20%, 25%, 35%
Return ACM	Yes

Receive

Data Rate	VersaFEC-2: 41.4 kbps to 10 Mbps DVB-S2X: 480 kbps to 130 Mbps (Software Licensed)
Symbol Rate	VersaFEC-2: Up to 8 Msps Minimum symbol rate is 42.3 ksps for BPSK/QPSK, 60 ksps for 8-ARY, 100 ksps for 16-ARY, 250 ksps for 32-ARY modulation DVB-S2X: 1 Msps –30 Msps for all MODCODs
FEC	VersaFEC-2 & DVB-S2X
Demodulation	VersaFEC-2: BPSK, QPSK, 8-ARY, 16-ARY,32-ARY DVBS2X: QPSK, 8PSK, 16APSK, 32APSK, 64APSK, 128APSK, 256APSK
Filter Rolloff	5%, 10%, 15%, 20%, 25%, 35%
Outbound ACM	Yes

Packets per Second Aggregate PPS (TX+RX)	> 35,000
Gigabit Ethernet Traffic Port	4

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

DoubleTalk® Carrier-in-Carrier®

FEC	Can only be used with VersaFEC-2 Coding
Delay Range	0 to 330 ms
Power Spectral Density Ratio (Interferer to Desired)	-7 dB to +7 dB
Maximum Symbol Rate Ratio	3:1 (TX:RX or RX:TX)
Es/No Degradation - measured with 1:1 symbol rate ratio and 0dB Power Spectral Density Ratio	BPSK / QPSK / 8ARY (0.4 dB) 16-ARY (0.6dB) 32-ARY (0.7dB)
Satellite Restrictions	Satellite must be non-processing and in “loop-back” mode (i.e. the transmit station can receive itself)

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	Programmable: Below 64 ksps = +/-1 1kHz to (Rs/2) kHz From 64 ksps – 389 ksps = +/- 1kHz to +/- 32kHz Above 389 ksps = +/- 1kHz to +/- (0.1 * Rs) kHz up to a max of +/- 300kHz
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, 47 Hz-63 Hz 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

Software Options

- FAST Heights Mode Operation
- FAST Heights TX Data Rate
- FAST SCPC TX Symbol Rate
- FAST DoubleTalk Carrier-in-Carrier Data Rate
- WANOp and WANOp GTP are UNAVAILABLE in SCPC mode; Header and Payload Compression are available in SCPC mode

2114 West 7th Street
Tempe, AZ 85281 USA
Phone +1.480.333.2200
Email sales@comtechefdata.com
www.comtechefdata.com

6/21/2021