Giga LongHaul™ *DATASHEET*

6 - 11 GHz

Carrier-Class | Licensed | All-Indoor

MICROWAVE BACKHAUL SYSTEM

PART OF
Orion™ Series

TRANGO SYSTEMS

Giga LongHaul™ Overview

The Giga LongHaul product is an all-indoor microwave backhaul system for 6-11 GHz Licensed Bands designed to provide high capacity communication over long distances. The system consists of an Indoor Modem Unit (IDU) and an Indoor RF Unit (IRFU). Full Duplex data rates up to 761 Mbps in a single 60 MHz channel can be achieved when used in conjunction with the Giga Orion IDU.

The system is available in single 1+0 to 8+0, 1+1 Hot Standby, and space diversity configurations. Over 5 Gbps full duplex capacity is available in an 8+0 configuration.

Carrier Features

The Giga LongHaul can support ring as well as hub and spoke network architectures, providing redundancy options for both through RSTP, MSTP, and ERPS. Network synchronization is supported through the use of Sync-E and IEEE1588v2. Multi-layer header compression and fixed latency regardless of packet size and modulation are designed in to support traffic mixes seen current and next gen mobile networks.

Security

With industry leading transmit power up to +36 dBm, the Giga LongHaul can provide higher reliability, longer distance links with smaller antennas. Combined with Advanced ACM with auto transmit power control on Giga Orion, the resulting system gain can yield up to twice the range as competing systems.

Long Range

The all-indoor design provides extra protection against environmental risks/theft and allows easy upgrade for legacy systems using standard waveguide. AES-256 encryption with standard proprietary encoding for Ethernet data provides additional security.

Applications

- Government / Municipal Networks
- Utilities / Energy
- Airport / Railroads
- Enterprise / Metro Area Networks (MAN)
- Fixed and Mobile Backhaul for LTE
- Healthcare / Hospital
- Banking / Finance

Features

Performance

- Up to 761 Mbps in a single 60 MHz channel (Non-XPIC mode)
- Over 1.5 Gbps capacity in a single 56 MHz channel XPIC or 112 MHz 2+0 configuration
- 1024QAM and Multilayer Header Compression
- Industry leading system gain over 6-11 GHz
- 3.5-60 MHz Channel Bandwidth

Advanced Networking

- Physical Link Aggregation (PLA) and packet fragmentation
- Cross Polarization Interference Cancellation (XPIC) enables operation on both polarities of a single channel
- Hitless Advanced Adaptive Coding & Modulation (AACM) with fixed latency
- Space diversity with IF combining
- 1+1 Hot Standby with Rapid Port Shutdown (RPS)

Interface

- 4 Data interfaces (2 Copper / 2 SFP Fiber or Copper)

Synchronization

- Sync-E and IEEE1588v2 timing over packet

Security & **Management**

- Secure management via HTTPS and SSH

Mechanical

- Indoor RF Unit (IRFU) Radio Transceiver is Housed in Standard 19" Rack Along with IDU (Modem) – Waveguide to Antenna Required
- Direct Power, -40 to -72 Vdc, with support for redundant inputs
- Industry's highest temp spec - up to +65°C (149°F)
- FCC/ETSI Compliant
- Standard 1-Year Manufacturer's Warranty

System Specifications

General Parameters	
Model Numbers	IRFU: HPL1-XX-YY-Z, IDU Compatibility: GigaPlus-IDU-1, GigaOrion-IDU-1
Frequency Support	L6, U6, 7, 8, 11 GHz
Channel Size ‡	3.5, 3.75, 5, 7, 8.33, 10, 12.5, 13.75/14, 20, 25, 27.5/28, 30, 40, 50, 55/56, 60 MHz
Modulation Format	Selectable: QPSK, 8PSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM, 512QAM, 1024QAM
Max Tx Power	+36 dBm (QPSK), +34 dBm (1024QAM)
Best RX Sensitivity	-96.6 dBm
Max Uncompressed Capacity	486-761 Mbps full duplex – Varies by modulation and bandwidth selected
Payload Latency	< 100 µs typical (GigaPlus IDU)
Payload Types	Ethernet (IPv4 and IPv6 compatible)
Features	FCC CFR47 Part 101 ETSI EN 302 217-1 ETSI EN 302 217-2 ETSI EN 301 489-1 EMC ETSI EN 301 489-4 EMC CANADA SRSP FCC/ANSI: FCC Part 15 Class A Unintentional Radiator RoHS
Regulatory Compliance ‡	FCC CFR47 Part 101 ETSI EN 301 489-1 EMC ETSI EN 301 489-4 EMC CANADA SRSP FCC/ANSI: FCC Part 15 Class A Unintentional Radiator RoHS
Safety	EN60950-1
MTBF	> 18 years

Ethernet Parameters	
Packet Size	64-9600 bytes
Link Aggregation	Physical Link Aggregation (PLA)
Quality of Service (QoS)	802.1p Port prioritization Diffserv (DSCP) Port mapping for traffic Support for up to 8 Classes of Service (CoS) Bandwidth shaping per port
Data Security	AES-128 or AES-256 (Option)

Management	
Security / Authentication	2 level password (Read only, read/write)
Configuration & Management	Telnet, SSH, HTTPS, Console (RS232), SNMPv2
Remote Firmware Update	FTP / TFTP server in radio unit

Interfaces	
Indicators	PA Alarm LED
IDU Interface	SMA-Female for telemetry, RX & TX IF
Antenna Interface	Rectangular Waveguide Flange
Power Connector	2 Pin D-sub Terminal Block

Power	
Power Input	-40 to -72 Vdc direct
Power Consumption	< 90 Watts typical (1+0 Configuration), 180 Watts typical (2+0 Configuration), (IRFU), +35 Watts (IDU)

Mechanical & Environmental	
Enclosure	All-Indoor air-cooled rack mount design
Dimensions (Height x Width x Length)	5 x 17 x 11 in. / 12.7 x 43.2 x 28 cm standard 19” rack mount, 2.77 height rack mounting space
Weight	< 15 lbs / 6.8 kg (1+0 Configuration) < 25 lbs / 11.3 kg (2+0 or 1+1 Configuration)
Temperature Range	-23° to 122° F / -5° to +50° C
Humidity	95% non-condensing

‡ Legal regulations for specific frequencies vary from region to region. Users are responsible for complying with their local regulations.

Receive Sensitivity In dBm

Channel Width (MHz)	Symbol Rate (Msps)	QPSK	8PSK	16 QAM	32 QAM	64 QAM	128 QAM	256 QAM	512* QAM	1024* QAM
3.5	3	-96.6	-93.3	-90.4	-86.4	-84.0	-80.9	-77.9	-74.4	-70.9
3.75	3.25	-96.4	93.1	90.2	86.2	83.8	80.7	-77.7	-74.2	-70.7
5	4.3	-94.4	-91.4	-88.8	-84.8	-82.1	-79.0	-76.0	-73	-69.6
7	5.6	-93.3	-90.7	-87.7	-83.7	-81.3	-78.2	-75.2	-71.4	-67.9
8.33	7.2	-92.7	-89.7	-86.5	-82.5	-80.3	-77.5	-74.4	-71.0	-67.4
10	8.32	-92.2	-89.0	-86.0	-82.0	-79.6	-76.5	-73.5	-70.1	-66.6
12.5	10.8	-91.3	-88.3	-85.4	-81.1	-78.7	-75.4	-72.4	-69.0	-65.5
14	12.2	-90.5	-87.3	-84.3	-80.3	-77.9	-74.8	-71.8	-68.4	-64.9
20	17.42	-89.0	-85.8	-82.8	-78.8	-76.4	-73.3	-70.3	-66.9	-63.4
25	21.8	-88.1	-85.1	-82.0	-78.0	-75.4	-72.3	-69.3	-65.9	-62.4
28/30	26	-87.3	-84.1	-81.1	-77.1	-74.7	-71.6	-68.6	-65.2	-61.7
40	34.83	-86.0	-82.8	-79.8	-75.8	-73.4	-70.3	-67.3	-63.9	-60.4
50	43	-85.1	-81.8	-78.9	-74.9	-72.5	-69.4	-66.4	-63.0	-59.5
55/56	52	-84.5	-80.3	-78.3	-74.3	-71.9	-68.8	-65.8	-62.4	-58.9

Maximum Tx Output Power

Model	Frequency of Operation (GHz)	QPSK	64 QAM	256 QAM	1024* QAM	TR Spacings (MHz)
HPL1-06-XXX-X	5.925 - 7.11	+36	+35	+34	+32	160, 170, 252.04, 300, 340, 350
HPL1-07-XXX-X	7.125 - 7.725	+35	+34	+33	+31	154, 160, 161, 168, 196, 245
HPL1-08-XXX-X	7.900 - 8.500	+35	+34	+33	+31	119, 126, 266, 311.12
HPL1-11-XXX-X	10.700 - 11.700	+34	+33	+32	+30	490, 500, 530

* When used with Giga Orion IDU only.