Giga Orion™

Gigabit Capacity, Split Mount Microwave Backhaul System 6-42 GHz

GIGABIT CAPACITY, SPLIT MOUNT MICROWAVE BACKHAUL SYSTEM

Overview

The Giga Orion™ is an ultra-high performance split architecture point-to-point wireless microwave system designed for carrier, enterprise, service provider, and government networks. The system is available for all standard licensed frequency bands from 6 to 42 GHz.

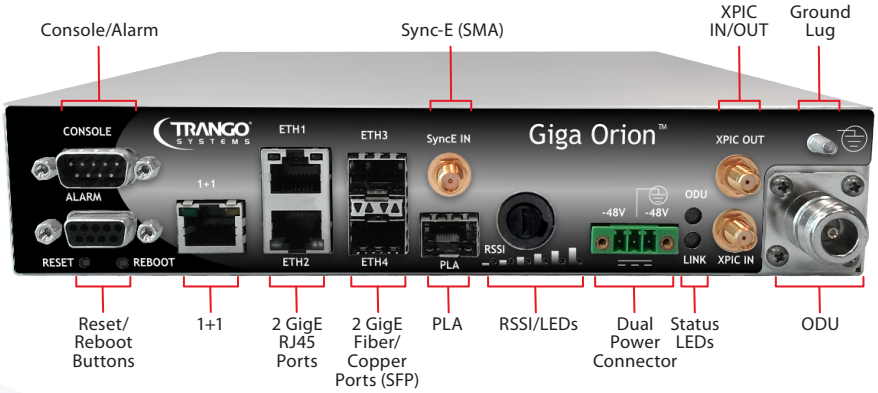
The Giga Orion offers modulation levels up to 1024QAM, Physical Link Aggregation, and XPIC enabling full gigabit performance. Other outstanding features include hitless advanced adaptive coding and modulation, comprehensive management and monitoring capability, and industry leading system gain.

Features

- Up to 761 Mbps full duplex Layer 2 Ethernet throughput in a single polarity 60 MHz channel using multi-layer header compression
- Up to 1.5 Gbps full duplex in 2+0 configuration
- Cross Polarization Interference Cancellation (XPIC) enables operation on both polarities of a single channel
- Port mapped traffic via user assigned VLANs
- Physical Link Aggregation (PLA) enables 2+0 operation at physical link level – not dependent on IP hashing or multiple IP streams
- 4 GigE Interfaces (2 copper, 2 SFP/fiber) for payload
- High Power ODUs coupled with LDPC provides industry-leading system gain
- Sync-E clock transport over microwave and IEEE1588v2 timing over packet support (Transparent Clock AND fixed latency)

Features Continued

- Ultra-low latency & jitter in all ACM modes
- 9 level hitless Advanced Adaptive Coding & Modulation (AACM) to provide link reliability in degraded channel conditions
- Automatic transmit power level increase on modulation downshift for improved system gain during fading (Adaptive Power Control)
- Secure management via HTTPS and SSH (in-band and out-of-band) as well as SNMP
- 1+1 Hot Standby with Rapid Port Shutdown (RPS)
- Diffserv, and VLAN QoS with 8 queues and strict/DWRR scheduling fully configurable on a per port basis
- 8 MB programmable packet buffer to absorb bursty traffic and improve TCP performance
- Dual input power supply support (redundant) -48V power
- FCC/ETSI Compliant
- Standard 2-Year Manufacturer's Warranty
- AES-256 Encryption (Requires Software Key)



System Specifications

GENERAL PARAMETERS		
Model Numbers	IDU: GIGAORION-IDU-1, ODU: HP1, HPL1 series	
Frequency Support	6-42 GHz, Frequency Division Duplex (FDD)	
Channel Size ‡	3.5, 5, 7, 8.33, 10, 12.5, 13.75/14, 20, 25, 27.5/28, 30, 40, 50, 55/56, 60, 80 MHz	
Modulation Format	Selectable: QPSK, 8PSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM, 512QAM, 1024QAM	
Max Uncompressed Capacity	490-750 Mbps full duplex – Varies by modulation, bandwidth, and packet mix	
Payload Latency	200 µs typical	
Payload Types	Ethernet (IPv4 and IPv6 compatible)	
Features	ATPC (Automatic Transmit Power Control) Hitless ACM (Adaptive Coding and Modulation) LDPC Forward Error Correction XPIC (Cross Polarization Interference Cancellation)	
Regulatory Compliance ‡	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	
Safety	EN60950-1	
MTBF	>18 years	
ETHERNET PARAMETERS		
Packet Size	64-9200 bytes	
Ring Protection	ERPS (G.8032), RSTP, MSTP (Future Release)	
Link Aggregation	802.3ad, Physical Link Aggregation (PLA)	
Quality of Service (QoS)	802.1p Port prioritization Diffserv (DSCP) MPLS Port mapping for traffic Support for up to 8 Classes of Service (CoS) Bandwidth shaping per port and flow Packet buffer 8 MB	
Data Security	AES-128 or AES-256 option (Future Release)	
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	**INDOOR UNIT**	**OUTDOOR UNIT** (without antenna)
Indicators	Ethernet speed and activity for each port; Multiplexed LED displays for RSSI 2 status LEDs per ODU	N/A
Payload Interfaces	2x GigE RJ45 (10/100/1000BaseT) 2x GigE Fiber / Copper SFP	TX IF, RX IF, Telemetry
Out-of-Band Management	Ethernet port RJ45 10/100BaseT	Via IDU IF cable
1+1 Hot Standby/PLA	RJ45	N/A
Sync-E input	SMA-Female 25 MHz, 10 MHz or ETH1-ETH4	N/A
Alarms	2 inputs – CMOS ; 2 outputs – Dry contact closure isolated 50V 1A	Loss of lock
Power Connector	3 Pin Terminal Block to support redundant power supplies	Provided by IDU
Console	DB9 RS232-115200, N, 8, 1	Via IDU IF cable
POWER	**INDOOR UNIT**	**OUTDOOR UNIT** (without antenna)
Power Input	-40 to –72 VDC Dual input	-40 to –72 VDC
Power Consumption	<35 Watts (all ports active)	< 35 Watts per ODU
MECHANICAL & ENVIRONMENTAL	**INDOOR UNIT**	**OUTDOOR UNIT** (without antenna)
Enclosure	8.75-inch half rackmount, 1U height	Cast Aluminum
ODU IF/Power/Control Connection	N-Female	N-Female (TX IF, RX IF, Telemetry), BNC-F for RSSI (HP ODU)
Dimensions (height × width × length)	1.75×8.75×11.25 inches	10.5x10.5x3.5 inches (HP1 ODU)
Weight	4.8 lbs	10.1 lbs (HP ODU)
Temperature Range (operational)	14° to 131° F (-10° to +55° C)	-40° to 131° F / -40° to +55° (spec compliant) -40° to 149° F / -40° to +65° (operational)
Humidity	95% non condensing	100% condensing

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

Receive Sensitivity In dBm (6-26 GHz)

Channel Width (MHz)	QPSK	8PSK	16 QAM	32 QAM	64 QAM	128 QAM	256 QAM	512 QAM	1024 QAM
3.5	-96.6	-93.3	-90.4	-86.4	-84.0	-80.9	-77.9	-74.4	-70.9
3.75	-96.4	93.1	90.2	86.2	83.8	80.7	-77.7	-74.2	-70.7
5	-94.4	-91.4	-88.8	-84.8	-82.1	-79.0	-76.0	-73	-69.6
7	-93.3	-90.7	-87.7	-83.7	-81.3	-78.2	-75.2	-71.4	-67.9
8.33	-92.7	-89.7	-86.5	-82.5	-80.3	-77.5	-74.4	-71.0	-67.4
10	-92.2	-89.0	-86.0	-82.0	-79.6	-76.5	-73.5	-70.1	-66.6
12.5	-91.3	-88.3	-85.4	-81.1	-78.7	-75.4	-72.4	-69.0	-65.5
14	-90.5	-87.3	-84.3	-80.3	-77.9	-74.8	-71.8	-68.4	-64.9
20	-89.0	-85.8	-82.8	-78.8	-76.4	-73.3	-70.3	-66.9	-63.4
25	-88.1	-85.1	-82.0	-78.0	-75.4	-72.3	-69.3	-65.9	-62.4
28/30	-87.3	-84.1	-81.1	-77.1	-74.7	-71.6	-68.6	-65.2	-61.7
40	-86.0	-82.8	-79.8	-75.8	-73.4	-70.3	-67.3	-63.9	-60.4
50	-85.1	-81.8	-78.9	-74.9	-72.5	-69.4	-66.4	-63.0	-59.5
55/56/60	-84.5	-80.3	-78.3	-74.3	-71.9	-68.8	-65.8	-62.4	-58.9

Receive Sensitivity In dBm (28-42 GHz)

Channel Width (MHz)	QPSK	8PSK	16 QAM	32 QAM	64 QAM	128 QAM	256 QAM	512 QAM	1024 QAM
3.5	-93.6	-90.6	-87.4	-83.4	-81.0	-77.9	-74.9	-71.4	-67.9
3.75	-93.4	-90.1	87.2	-83.2	-80.8	-77.7	-74.7	-71.2	-67.7
5	-91.4	-88.4	-85.8	-81.8	-79.1	-76.0	-73.0	-70.0	-66.6
7	-90.9	-87.9	-84.7	-80.7	-78.3	-75.2	-72.2	-68.4	-64.9
8.33	-89.7	-86.7	-83.5	-79.5	-77.3	-74.5	-71.4	-68.0	-64.4
10	-89.2	-86.2	-83.0	-79.0	-76.6	-73.5	-70.5	-67.1	-63.6
12.5	-88.3	-85.3	-82.4	-78.1	-75.7	-72.4	-69.4	-66.0	-62.5
14	-87.5	-84.5	-81.3	-77.3	-74.9	-71.8	-68.8	-65.4	-61.9
20	-86.0	-83.0	-79.8	-75.8	-73.4	-70.3	-67.3	-63.9	-60.4
25	-85.1	-82.0	-79.0	-75.0	-72.4	-69.3	-66.3	-62.9	-59.4
28/30	-84.4	-81.4	-78.1	-74.1	-71.7	-68.6	-65.6	-62.2	-58.7
40	-83.0	-80	-76.8	-72.8	-70.4	-67.3	-64.3	-60.9	-57.4
50	-82.1	-79.1	-75.9	-71.9	-69.5	-66.4	-63.4	-60.0	-56.5
55/56/80	-81.5	-78.5	-75.3	-71.3	-68.9	-65.8	-62.8	-59.4	-55.9

Capacity Range 1518-64 byte packets (Mbps)

Channel Width (MHz)	QPSK	8PSK	16 QAM	32 QAM	64 QAM	128 QAM	256 QAM	512 QAM	1024 QAM
3..5	5.5 - 8.7	8.4 - 13.2	11.3 - 17.8	13.9 - 22	17 - 26.8	19.9 - 31.4	22.7 - 35.8	25.6 - 40.4	27.8 - 43.9
3.75	6.0 - 9.5	9.1 - 14.4	12.2 - 19.3	15.1 - 23.8	18.4 - 29.1	21.6 - 34	24.7 - 38.9	27.8 - 43.8	30.2 - 47.5
5	8 - 12.7	12.1 - 19.1	16.2 - 25.6	20 - 31.6	24.5 - 38.6	28.6 - 45	32.7 - 51.5	36.8 - 58.0	40 - 63.0
7	10.5 - 16.6	15.5 - 24.9	21.2 - 33.4	26.2 - 41.2	31.9 - 50.3	37.3 - 58.7	42.6 - 67.8	48 - 75.6	52.1 - 82.1
8.33	13.5 - 21.4	20.4 - 32.1	27.3 - 43.1	33.7 - 53.1	41.1 - 64.7	48 - 75.6	54.8 - 86.4	61.7 - 97.3	67.1 - 105.6
10	15.7 - 24.7	23.6 - 37.1	31.6 - 49.8	38.9 - 61.3	47.5 - 74.8	55.5 - 87.4	63.4 - 99.9	71.4 - 112.4	77.5 - 122.1
12.5	20 - 32	30.6 - 48.3	41.1 - 64.7	50.6 - 79.7	61.7 - 97.2	72.1 - 113.5	80.4 - 129.7	92.7 - 146	100.7 - 158.6
14	23 - 36	34 - 54	46 - 73	57 - 90	69 - 109	81 - 128	93 - 146	104 - 165	113 - 179
20	33 - 52	49 - 78	66 - 105	82 - 129	100 - 147	116 - 184	133 - 210	150 - 236	163 - 257
25	41 - 65	62 - 97	83 - 130	102 - 161	124 - 196	145 - 229	166 - 262	187 - 295	203 - 320
28/30	49 - 77	74 - 116	99 -156	122 - 196	148 - 234	173 - 273	198 - 312	223 - 351	242 - 382
40	66 - 104	99 - 157	133 - 210	164 - 258	200 - 315	234 - 368	267 - 420	300 - 473	326 - 514
50	78 - 119	122 - 189	164 - 258	202 - 318	246 - 387	287 - 452	328 - 517	369 - 582	401 - 632
55/56	98 - 155	148 - 233	198 - 312	244 - 384	297 - 469	347 - 547	397 - 625	447 - 704	486 - 761

* The numbers shown above are for full duplex. Aggregate capacities are double. Throughput measured with IPv4 layer 2 plus a single VLAN tag. Max capacity over 750 Mbps with IPv6.

ETSI System T/R Spacings

6 GHz	7 GHz	8 GHz	11 GHz	13 GHz	15 GHz
240, 252.04, 340	154, 160, 161, 168, 196, 245	119, 126, 151.614, 208, 266, 311.32	490, 500, 530	266	315, 420, 475, 490, 640, 644, 728

18 GHz	23 GHz	26 GHz	28 GHz	32 GHz	38 GHz	42 GHz
1010	1008, 1232	800, 1008	1008	812	700, 1260	1500

ANSI System T/R Spacings

6 GHz	7 GHz	11 GHz	13 GHz	15 GHz	18 GHz	23 GHz	38 GHz
160, 170, 252.04, 340	150	490, 500	225	475, 640	1560	1200, 1232	700

Max Tx Power by Frequency (dBm)

Mod	6, 7, 8 GHz	10 GHz	11 GHz	13,15 GHz	18-26 GHz	28-40 GHz	42 GHz
QPSK	30	26.5	28	26	25	23	20
8PSK	30	26.5	28	26	25	23	20
16QAM	28	22.5	26	25	23	21	17
32QAM	28	22.5	26	25	23	21	17
64QAM	25	20.5	25	24	22	17	14
128QAM	25	20.5	25	24	22	17	14
256QAM	24	18.5	24	23	21	16	13
512QAM	24	17.5	24	23	21	15	13
1024QAM	23	16.5	23	22	20	14	12

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