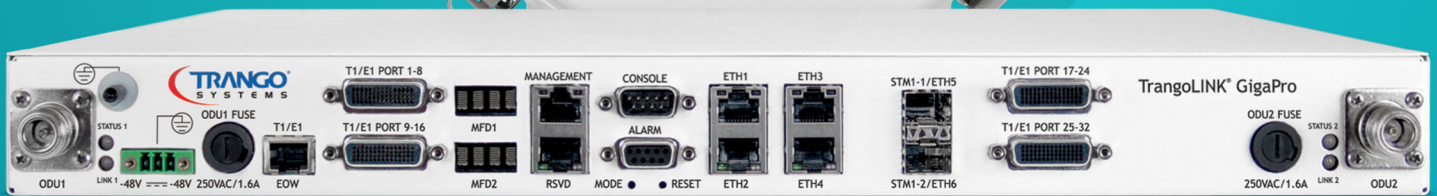


Giga Pro™ DATASHEET

6 - 40 GHz

Professional-Grade | Licensed | Split-Mount: Dual Modem

MICROWAVE BACKHAUL SYSTEM



PART OF
Plus™ Series



Giga Pro™ Overview

Giga Pro's unique dual modem architecture offers a scalable, highly reliable link due to its ability to seamlessly switch or aggregate traffic between the two active ODUs. This architecture supports hitless 1+1, 2+0, East/West and Frequency/Spatial Diversity configuration in a single 1U form factor. Giga Pro is available in a single modem (Giga Pro/SM) and dual modem (Giga Pro/DM) configuration.

Innovative Design

Giga Pro's innovative design protects your microwave backhaul investment. Embedded software keys enable flexible speed and feature upgrades - allowing you to unlock speeds ranging from 100 to 750 Mbps. The software keys also unleash additional TDM functionality. Giga Pro's protection allows you to easily migrate from your TDM network today to the 4G all Ethernet architecture of tomorrow.

Applications

- LTE / WiMAX / 3G / 4G Backhaul
- Private / Enterprise
- Fixed Wireless / ISP
- Public Safety / Video Surveillance
- Broadcast

Features

Performance

- Up to 1.5 Gbps (750 Mbps full duplex) capacity
- Industry leading system gain over 6-40 GHz
- 3.5-56 MHz Channel Bandwidth
- Support for up to 8 Classes of Service (CoS)
- Up to 2,000,000 packets per second
- Low latency

Advanced Networking

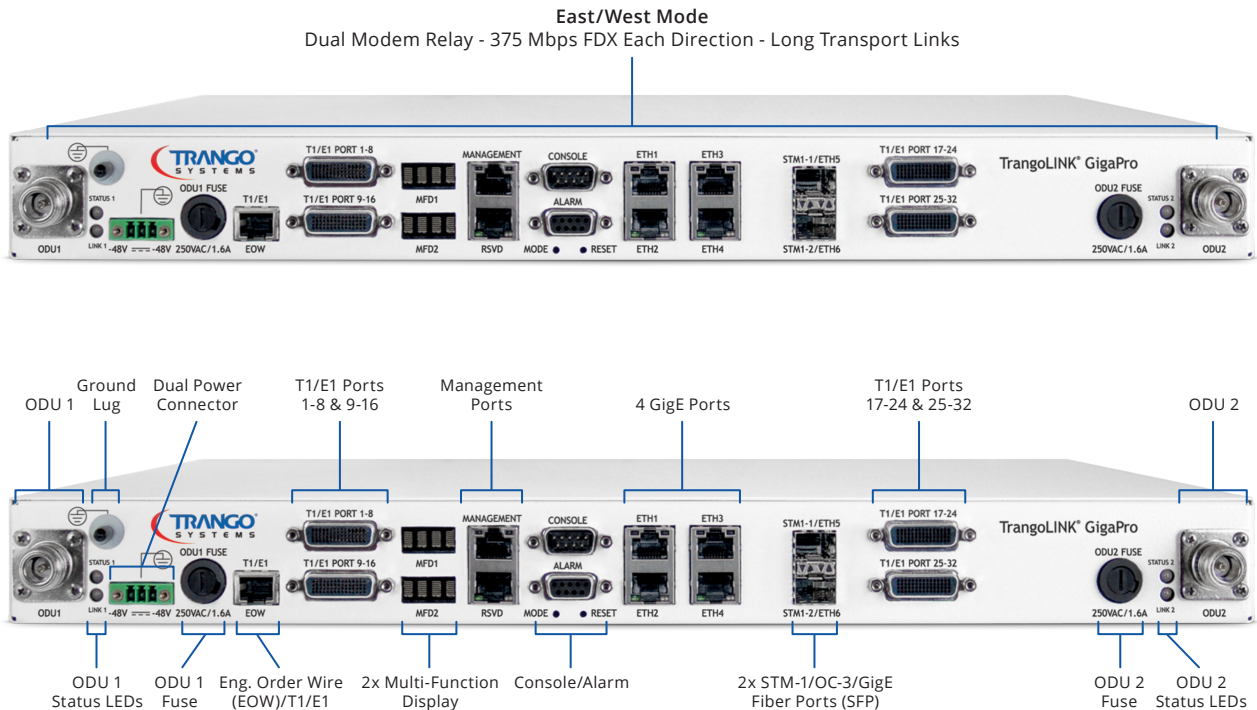
- Hitless Adaptive Code Modulation (ACM)
- Hitless 1+1 Hot Standby
- Baseband switching for link reliability
- East/West mode for long haul relay links
- Frequency & Spatial Diversity

Interface & Management

- 2x GigE Fiber, 4x GigE Copper ports, 2x STM-1/OC-3 interfaces
- 16x-32x T1/E1 RJ45 (With optional patch panels)
- 2x CMOS Inputs & 2x Dry Contact Outputs
- Min/Max shaping per port

Mechanical

- Dual Modem, Split-Mount, rugged, durable and compact form factor with separate IDU (Modem) & ODU (Transceiver)
- Industry's highest temp spec - up to +65°C (149°F)
- FCC/ETSI & NEBS Compliant
- Standard 1-Year Manufacturer's Warranty



System Specifications

General Parameters			
Model Numbers	IDU: GigaPro-IDU-1, ODU: WaveLab Advantage Series ODU		
Frequency Support	6-40 GHz Frequency Division Duplex (FDD)		
Channel Size †	3.5, 5, 7, 8.33, 10, 12.5, 13.75/14, 20, 25, 28, 30, 40, 50, 55/56, 80 MHz		
Modulation Format	Selectable: QPSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM, ACM & non-ACM		
Max Capacity	750 Mbps full duplex – Varies by modulation and bandwidth selected		
Payload Latency	100 µs typical		
Payload Types	Ethernet, T1/E1, STM-1, OC3		
Features	ATPC (Automatic Transmit Power Control) Hitless ACM (Adaptive Coding and Modulation) Modulation Shifting Forward Error Correction LDPC		
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	T1: T/O 1002-1993 ITU-T.G824 GR-499-CORE	E1: ITU-T G.703 G.823
Safety	EN60950-1, EN60950-22		
MTBF	> 18 years		

Ethernet Parameters	
Packet Size	64-9600 bytes
Flow Control	Yes, via Ethernet pause frames (GigE mode only)
Quality of Service (QoS)	802.1p Port prioritization Port mapping for traffic Support for up to 8 Classes of Service (CoS) Bandwidth shaping per port

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

Interfaces	Indoor Unit	Outdoor Unit (Without Antenna)
Indicators	Ethernet speed and activity for each port; Dual multi-function display 2 status LEDs per ODU	N/A
Payload Interfaces	4x GigE RJ45 (10/100/1000BaseT) 32x T1/E1 RJ45 2x STM-1/OC-3/GigE Fiber SFP EOW/T1/E1 RJ45	TX IF, RX IF, Telemetry
Out-of-Band Management	Ethernet port RJ45	Via IDU
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

Power	Indoor Unit	Outdoor Unit (Without Antenna)
Power Input IDU Dual	-40 to -72 Vdc Dual input	-24 to -72 Vdc
Power Consumption	< 70 Watts (All ports active)	Up to 52 Watts per ODU

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

Mechanical & Environmental	Indoor Unit	Outdoor Unit (Without Antenna)
Enclosure	19-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 (WaveLab ODU)
Dimensions (Height x Width x Length)	1.75 x 19 x 13 in. / 4.4 x 48.2 x 33 cm	9.4 x 10.9 x 3.6 in. / 23.9 x 27.7 x 9.1 cm (WaveLab ODU)
Weight	9.3 lbs / 4.2 kg	≤ 9.5 lbs / 4.3 kg (WaveLab ODU)
Temperature Range	14° to 131° F / -10° to +55° C	-40° to 131° F / -40° to +55° C (Spec compliant) -40° to 149° F / -40° to +65° C (Operational)
Humidity	95% non condensing	100% condensing

ANSI System Parameters

				Band of Operation (GHz)								
				6	11	15	18	23	38			
				Capacity (Mbps)	Channel BW (MHz)	Mod						
T/R Spacing Supported				160, 170, 252.04, 340	490, 500	475, 640	1560	1200, 1232	700			
Max Transmit Power (dBm)				All	QPSK	30	28	26	25	25	23	
				All	16QAM	28	26	23	22	22	21	
				All	32QAM	28	26	23	22	22	21	
				All	64QAM	25	22	21	20	20	17	
				All	128QAM	25	22	21	20	20	17	
Receive Sensitivity (dBm) For BER = 1E-6				15	10	QPSK	-92.2	-92.2	-92.2	-92.2	-92.2	-89.2
				31	10	16QAM	-86.0	-86.0	-86.0	-86.0	-86.0	-86.0
				38	10	32QAM	-82.0	-82.0	-82.0	-82.0	-82.0	-79.0
				46	10	64QAM	-79.6	-79.6	-79.6	-79.6	-79.6	-79.6
				53	10	128QAM	-76.5	-76.5	-76.5	-76.5	-76.5	-73.5
				60	10	256QAM	-73.5	-73.5	-73.5	-73.5	-73.5	-73.5
				31	20	QPSK	-89.0	-89.0	-89.0	-89.0	-89.0	-86.0
				64	20	16QAM	-82.8	-82.8	-82.8	-82.8	-82.8	-82.8
				79	20	32QAM	-78.8	-78.8	-78.8	-78.8	-78.8	-75.8
				96	20	64QAM	-76.4	-76.4	-76.4	-76.4	-76.4	-76.4
				112	20	128QAM	-73.3	-73.3	-73.3	-73.3	-73.3	-70.3
				127	20	256QAM	-70.3	-70.3	-70.3	-70.3	-70.3	-70.3
				46	30	QPSK	-87.3	-87.3	-87.3	-87.3	-87.3	-84.3
				96	30	16QAM	-81.1	-81.1	-81.1	-81.1	-81.1	-81.1
				118	30	32QAM	-77.1	-77.1	-77.1	-77.1	-77.1	-74.1
				143	30	64QAM	-74.7	-74.7	-74.7	-74.7	-74.7	-74.7
				167	30	128QAM	-71.6	-71.6	-71.6	-71.6	-71.6	-68.6
				190	30	256QAM	-68.6	-68.6	-68.6	-68.6	-68.6	-68.6
				62	40	QPSK	-86.0	-86.0	-86.0	-86.0	-86.0	-83.0
				128	40	16QAM	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8
				158	40	32QAM	-75.8	-75.8	-75.8	-75.8	-75.8	-72.8
				193	40	64QAM	-73.4	-73.4	-73.4	-73.4	-73.4	-73.4
				224	40	128QAM	-70.3	-70.3	-70.3	-70.3	-70.3	-67.3
				256	40	256QAM	-67.3	-67.3	-67.3	-67.3	-67.3	-67.3
				77	50	QPSK	-85.1	-85.1	-85.1	-85.1	-85.1	-82.1
				158	50	16QAM	-78.9	-78.9	-78.9	-78.9	-78.9	-78.9
				196	50	32QAM	-74.9	-74.9	-74.9	-74.9	-74.9	-71.9
				237	50	64QAM	-72.5	-72.5	-72.5	-72.5	-72.5	-72.5
				277	50	128QAM	-69.4	-69.4	-69.4	-69.4	-69.4	-66.4
				316	50	256QAM	-66.4	-66.4	-66.4	-66.4	-66.4	-66.4
Basic Package = 118 Mbps Max				89	80	QPSK	-84.5	-84.5	-84.5	-84.5	-81.5	
License Key 1 = 196 Mbps Max*				182	80	16QAM	-78.3	-78.3	-78.3	-78.3	-78.3	-75.3
				226	80	32QAM	-74.3	-74.3	-74.3	-74.3	-74.3	-74.3
License Key 2 = 375 Mbps Max*				274	80	64QAM	-71.9	-71.9	-71.9	-71.9	-71.9	-68.9
				319	80	128QAM	-68.8	-68.8	-68.8	-68.8	-68.8	-68.8
				375**	80	256QAM	-65.8	-65.8	-65.8	-65.8	-62.8	

* Based on purchasable capacity key. Contact sales for more information.

** 375 Mbps (Ethernet, non-ACM) available in the same bandwidth with 2dB more Rx sensitivity. Capacities shown are for one modem enabled. With both modems enabled capacities are doubled.

DS-1003-H 4 of 5

ETSI System Parameters

			Band of Operation (GHz)												
Capacity (Mbps)	Channel BW (MHz)	Mod	6	7	8	11	13	15	18	23	26	28	32	38	
T/R Spacing Supported			240, 252.04, 300, 340, 350	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	1010	1008, 1232	800, 1008	1008	812	700, 1260	
Max Transmit Power (dBm)		All	QPSK	30	30	30	28	26	26	25	25	25	23	23	23
		All	16QAM	28	28	28	26	23	23	22	22	22	21	21	21
		All	32QAM	28	28	28	26	23	23	22	22	22	21	21	21
		All	64QAM	25	25	25	22	21	21	20	20	20	17	17	17
		All	128QAM	25	25	25	22	21	21	20	20	20	17	17	17
Receive Sensitivity (dBm) For BER = 1E-6	5	3.5	QPSK	-96.6	-96.6	-96.6	-96.6	-96.6	-96.6	-96.6	-96.6	-93.6	-93.6	-93.6	
	11	3.5	16QAM	-90.4	-90.4	-90.4	-90.4	-90.4	-90.4	-90.4	-90.4	-87.4	-87.4	-87.4	
	13	3.5	32QAM	-86.4	-86.4	-86.4	-86.4	-86.4	-86.4	-86.4	-86.4	-83.4	-83.4	-83.4	
	16	3.5	64QAM	-84.0	-84.0	-84.0	-84.0	-84.0	-84.0	-84.0	-84.0	-81.0	-81.0	-81.0	
	18	3.5	128QAM	-80.9	-80.9	-80.9	-80.9	-80.9	-80.9	-80.9	-80.9	-77.9	-77.9	-77.9	
	22	3.5	256QAM	-77.9	-77.9	-77.9	-77.9	-77.9	-77.9	-77.9	-77.9	-74.9	-74.9	-74.9	
	10	7	QPSK	-93.9	-93.9	-93.9	-93.9	-93.9	-93.9	-93.9	-93.9	-93.9	-90.9	-90.9	-90.9
	20	7	16QAM	-87.7	-87.7	-87.7	-87.7	-87.7	-87.7	-87.7	-87.7	-87.7	-84.7	-84.7	-84.7
	25	7	32QAM	-83.7	-83.7	-83.7	-83.7	-83.7	-83.7	-83.7	-83.7	-83.7	-80.7	-80.7	-80.7
	31	7	64QAM	-81.3	-81.3	-81.3	-81.3	-81.3	-81.3	-81.3	-81.3	-81.3	-78.3	-78.3	-78.3
	36	7	128QAM	-78.2	-78.2	-78.2	-78.2	-78.2	-78.2	-78.2	-78.2	-78.2	-75.2	-75.2	-75.2
	40	7	256QAM	-75.2	-75.2	-75.2	-75.2	-75.2	-75.2	-75.2	-75.2	-75.2	-72.2	-72.2	-72.2
	22	13.75/14	QPSK	-90.5	-90.5	-90.5	-90.5	-90.5	-90.5	-90.5	-90.5	-90.5	-87.5	-87.5	-87.5
	45	13.75/14	16QAM	-84.3	-84.3	-84.3	-84.3	-84.3	-84.3	-84.3	-84.3	-84.3	-81.3	-81.3	-81.3
	56	13.75/14	32QAM	-80.3	-80.3	-80.3	-80.3	-80.3	-80.3	-80.3	-80.3	-80.3	-77.3	-77.3	-77.3
	67	13.75/14	64QAM	-77.9	-77.9	-77.9	-77.9	-77.9	-77.9	-77.9	-77.9	-77.9	-74.9	-74.9	-74.9
	78	13.75/14	128QAM	-74.8	-74.8	-74.8	-74.8	-74.8	-74.8	-74.8	-74.8	-74.8	-71.8	-71.8	-71.8
	89	13.75/14	256QAM	-71.8	-71.8	-71.8	-71.8	-71.8	-71.8	-71.8	-71.8	-71.8	-68.8	-68.8	-68.8
	46	27.5/28	QPSK	-87.3	-87.3	-87.3	-87.3	-87.3	-87.3	-87.3	-87.3	-87.3	-84.3	-84.3	-84.3
	96	27.5/28	16QAM	-81.1	-81.1	-81.1	-81.1	-81.1	-81.1	-81.1	-81.1	-81.1	-78.1	-78.1	-78.1
	118	27.5/28	32QAM	-77.1	-77.1	-77.1	-77.1	-77.1	-77.1	-77.1	-77.1	-77.1	-74.1	-74.1	-74.1
	143	27.5/28	64QAM	-74.7	-74.7	-74.7	-74.7	-74.7	-74.7	-74.7	-74.7	-74.7	-71.7	-71.7	-71.7
	167	27.5/28	128QAM	-71.6	-71.6	-71.6	-71.6	-71.6	-71.6	-71.6	-71.6	-71.6	-68.6	-68.6	-68.6
	190	27.5/28	256QAM	-68.6	-68.6	-68.6	-68.6	-68.6	-68.6	-68.6	-68.6	-68.6	-65.6	-65.6	-65.6
	62	40	QPSK	-86.0	-86.0	-86.0	-86.0	-86.0	-86.0	-86.0	-86.0	-86.0	-83.0	-83.0	-83.0
	128	40	16QAM	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-79.8	-76.8	-76.8	-76.8
	158	40	32QAM	-75.8	-75.8	-75.8	-75.8	-75.8	-75.8	-75.8	-75.8	-75.8	-72.8	-72.8	-72.8
193	40	64QAM	-73.4	-73.4	-73.4	-73.4	-73.4	-73.4	-73.4	-73.4	-73.4	-70.4	-70.4	-70.4	
224	40	128QAM	-70.3	-70.3	-70.3	-70.3	-70.3	-70.3	-70.3	-70.3	-70.3	-67.3	-67.3	-67.3	
Basic Package = 118 Mbps Max	256	40	256QAM	-67.3	-67.3	-67.3	-67.3	-67.3	-67.3	-67.3	-67.3	-64.3	-64.3	-64.3	
License Key 1 = 196 Mbps Max*	89	55/56	QPSK	-84.5	-84.5	-84.5	-84.5	-84.5	-84.5	-84.5	-84.5	-81.5	-81.5	-81.5	
	182	55/56	16QAM	-78.3	-78.3	-78.3	-78.3	-78.3	-78.3	-78.3	-78.3	-75.3	-75.3	-75.3	
License Key 2 = 375 Mbps Max*	226	55/56	32QAM	-74.3	-74.3	-74.3	-74.3	-74.3	-74.3	-74.3	-74.3	-71.3	-71.3	-71.3	
	274	55/56	64QAM	-71.9	-71.9	-71.9	-71.9	-71.9	-71.9	-71.9	-71.9	-68.9	-68.9	-68.9	
	319	55/56	128QAM	-68.8	-68.8	-68.8	-68.8	-68.8	-68.8	-68.8	-68.8	-65.8	-65.8	-65.8	
	375**	55/56	256QAM	-65.8	-65.8	-65.8	-65.8	-65.8	-65.8	-65.8	-65.8	-62.8	-62.8	-62.8	

* Based on purchasable capacity key. Contact sales for more information.

** 375 Mbps (Ethernet, non-ACM) available in the same bandwidth with 2dB more Rx sensitivity. Capacities shown are for one modem enabled. With both modems enabled capacities are doubled.

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