

POINT-TO-POINT

TrangoLINK® GigaPro

High Performance, Ethernet & SDH/PDH Native Licensed Microwave Backhaul System 6-38 GHz



HIGH-CAPACITY SCALABLE POINT-TO-POINT WIRELESS NETWORKS

Dual Modem Architecture

GigaPro'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 configurations in a single 1U form factor. TrangoLINK® GigaPro is available in a single modem (GigaPro/SM) and dual modem (GigaPro/DM) configuration.

Future-Proof Design

GigaPro's future-proof 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. GigaPro's future-proof protection allows you to easily migrate from your TDM network today to the 4G all Ethernet architecture of tomorrow.

Applications

- » Carrier backhaul
- » WiMAX backhaul
- » Mobile backhaul
- » Other ISP solutions

GigaPro/SM

The single modem GigaPro/SM includes:

- » Hitless ACM
- » Throughput up to 375 Mbps full duplex
- » 4x GigE, 1 STM-1/OC-3, 16x T1/E1

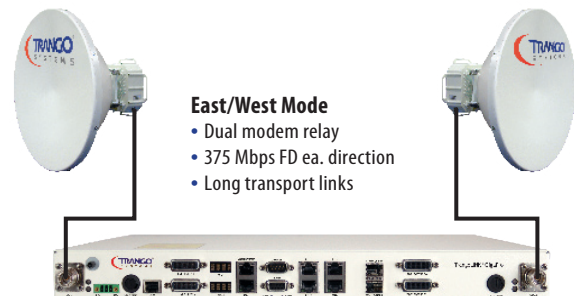
GigaPro/DM

The dual modem GigaPro/DM includes additional features:

- » Hitless 1+1 Link Redundancy (375 Mbps full duplex)
- » ODU Link Aggregation (750 Mbps full duplex)
- » East/West mode for long haul relay links (375 Mbps full duplex)
- » Frequency/Spatial Diversity
- » 4x GigE, 2x STM-1/OC-3, 32x T1/E1

Features

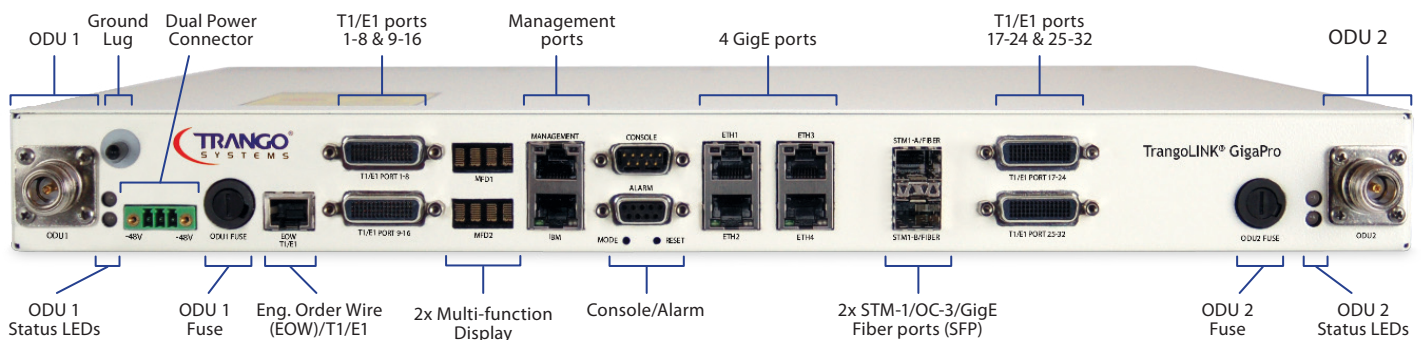
- » Up to 1.5 Gbps Aggregate Capacity
- » Dual & Single Modem Options
- » Hitless Adaptive Code Modulation (ACM)
- » Hitless 1+1 Hot Standby
- » Frequency & Spatial Diversity
- » Industry-Leading System Gain
- » 6-38 GHz Support
- » 3.5-56 Mhz Channel Bandwidth
- » Up to 2,000,000 Packets per Second
- » 2x GigE Fiber & 4x GigE Copper Ports
- » 2x STM-1/OC-3 Interfaces
- » 32x T1/E1 Ports
- » Support for up to 8 Classes of Service (CoS)
- » Min/Max shaping per port
- » FCC/ETSI & NEBS Compliant
- » Standard 2-Year Manufacturer's Warranty



System Specifications

GENERAL PARAMETERS			
Frequency Support	6-38 GHz		
Channel Size †	3.5 MHz - 56 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 Adaptive Code Modulation, Modulation Shifting, LDPC, Forward Error Correction		
Regulatory Compliance †	FCC/ANSI: FCC Part 15 Class A Unintentional Radiator ETSI EN 302 217-1 ETSI EN 302 217-2 ETSI EN 301 489-1 EMC ETSI EN 301 489-4 EMC 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	2-digit LED "in dBm" RSSI for alignment (- SP)
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 Port		1 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	Via IDU
POWER		INDOOR UNIT	OUTDOOR UNIT (without antenna)
Power Input IDU Dual		-40 to -72 VDC	-40 to -72 VDC
Power Consumption		<70 Watts (all ports active)	Up to 52 Watts per ODU
MECHANICAL & ENVIRONMENTAL		INDOOR UNIT	OUTDOOR UNIT (without antenna)
Enclosure		19-inch rackmount, 1U height	Cast Aluminum
ODU IF/Power/Control Connection		N-Female	N-Female (TX IF, RX IF, Telemetry), BNC-F for RSSI (- HP)
Dimensions (height x width x length)		1.75 x 19 x 13 inches	1.75 x 12 x 6.8 inches (- SP) 10.5 x 10.5 x 3.5 inches (- HP)
Weight		9.3 lbs	13.5 lbs (- SP) 10.1 lbs (- HP)
Temperature Range (operational)		14° to 122° F (-10° to +45° C)	-40° to 131° F / -40° to +55° C (- SP) -27° to 131° F / -33° to +55° C (- HP)
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.



ANSI System Parameters (HP Series ODU)

	Speed (Mbps)	Channel BW (MHz)	Mod	Band (GHz)					
				6	11	15	18	23	38
T/R Spacings Supported (MHz)				252.04, 340	490, 500	475, 640	1560	1200	700
Standards Supported				FCC Part 101, SRSP 306.4	FCC Part 101, SRSP 310.7	FCC Part 101, SRSP 314.5	FCC Part 101, SRSP 317.7 SRSP 318.5	FCC Part 101, SRSP 321.8	FCC Part 101
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
		All	256QAM	24	21	20	19	19	16
Receiver Sensitivity (dBm)	14	10	QPSK	-92.2	-92.2	-92.2	-92.2	-92.2	-89.2
	59	10	256QAM	-73.5	-73.5	-73.5	-73.5	-73.5	-70.5
	31	20	QPSK	-89	-89	-89	-89	-89	-86
	126	20	256QAM	-70.3	-70.3	-70.3	-70.3	-70.3	-67.3
	47	30	QPSK	-87.3	-87.3	-87.3	-87.3	-87.3	-84.3
	190	30	256QAM	-68.6	-68.6	-68.6	-68.6	-68.6	-65.6
	63	40	QPSK	-86	-86	-86	-86	-86	-83
	256	40	256QAM	-67.3	-67.3	-67.3	-67.3	-67.3	-64.3
	78	50	QPSK	-85.1	-85.1	-85.1	-85.1	-85.1	-82.1
	319	50	256QAM	-66.4	-66.4	-66.4	-66.4	-66.4	-63.4
	90	80	QPSK	-84.5	-84.5	-84.5	-84.5	-84.5	-81.5
365*	80	256QAM	-65.8	-65.8	-65.8	-65.8	-65.8	-62.8	
System Gain (dB)	14	10	QPSK	122.2	120.2	118.2	117.2	117.2	112.2
	59	10	256QAM	97.5	94.5	93.5	92.5	92.5	86.5
	31	20	QPSK	119	117	115	114	114	109
	126	20	256QAM	94.3	91.3	90.3	89.3	89.3	83.3
	47	30	QPSK	117.3	115.3	113.3	112.3	112.3	107.3
	190	30	256QAM	92.6	89.6	88.6	87.6	87.6	81.6
	63	40	QPSK	116	114	112	111	111	106
	256	40	256QAM	91.3	88.3	87.3	86.3	86.3	80.3
	78	50	QPSK	115.1	113.1	111.1	110.1	110.1	105.1
	319	50	256QAM	90.4	87.4	86.4	85.4	85.4	79.4
	90	80	QPSK	114.5	112.5	110.5	109.5	109.5	104.5
365*	80	256QAM	89.8	86.8	85.8	84.8	84.8	78.8	

*375 Mbps (Ethernet, non-ACM) available in the same bandwidth with 2dB less system gain.

ETSI System Parameters (HP Series ODU)

				Band (GHz)												
		Channel BW (MHz)	Mod	6	7	8	11	13	15	18	23	26	28	32	38	
T/R Spacings Supported (MHz)				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	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	
		All	256QAM	24	24	24	21	20	20	19	19	19	19	16	16	16
Receiver Sensitivity (dBm)		4	3.5	QPSK	-96.6	-96.6	-96.6	-96.6	-96.6	-96.6	-96.6	-96.6	-96.6	-93.6	-93.6	-93.6
		20	3.5	256QAM	-77.9	-77.9	-77.9	-77.9	-77.9	-77.9	-77.9	-77.9	-77.9	-74.9	-74.9	-74.9
		9	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
		39	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
		21	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
		88	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
		47	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
		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
		90	55/56	QPSK	-84.5	-84.5	-84.5	-84.5	-84.5	-84.5	-84.5	-84.5	-84.5	-81.5	-81.5	-81.5
		365*	55/56	256QAM	-65.8	-65.8	-65.8	-65.8	-65.8	-65.8	-65.8	-65.8	-65.8	-62.8	-62.8	-62.8
System Gain (dB)		4	3.5	QPSK	126.6	126.6	126.6	124.6	122.6	122.6	121.6	121.6	121.6	116.6	116.6	116.6
		20	3.5	256QAM	101.9	101.9	101.9	98.9	97.9	97.9	96.9	96.9	96.9	90.9	90.9	90.9
		9	7	QPSK	123.9	123.9	123.9	121.9	119.9	119.9	118.9	118.9	118.9	113.9	113.9	113.9
		39	7	256QAM	99.2	99.2	99.2	96.2	95.2	95.2	94.2	94.2	94.2	88.2	88.2	88.2
		21	13.75/14	QPSK	120.5	120.5	120.5	118.5	116.5	116.5	115.5	115.5	115.5	110.5	110.5	110.5
		88	13.75/14	256QAM	95.8	95.8	95.8	92.8	91.8	91.8	90.8	90.8	90.8	84.8	84.8	84.8
		47	27.5/28	QPSK	117.3	117.3	117.3	115.3	113.3	113.3	112.3	112.3	112.3	107.3	107.3	107.3
		190	27.5/28	256QAM	92.6	92.6	92.6	89.6	88.6	88.6	87.6	87.6	87.6	81.6	81.6	81.6
		90	55/56	QPSK	114.5	114.5	114.5	112.5	110.5	110.5	109.5	109.5	109.5	104.5	104.5	104.5
		365*	55/56	256QAM	89.8	89.8	89.8	86.8	85.8	85.8	84.8	84.8	84.8	78.8	78.8	78.8

*375 Mbps (Ethernet, non-ACM) available in the same bandwidth with 2dB less system gain.

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