



POINT-TO-POINT

## TrangoLINK® Apex 11 GHz All-Outdoor Full Duplex Licensed Microwave Native Ethernet Wireless Backhaul System

HIGH-CAPACITY POINT-TO-POINT WIRELESS NETWORK LINK

TrangoLINK® Apex is an all-outdoor high-capacity full duplex wireless point-to-point radio link that is ideal for carrier Ethernet, WiMAX/ISP broadband backhaul, private Enterprise networks, municipal/government networks, and broadcast applications using the licensed 11 GHz spectrum.

TrangoLINK® Apex offers simplified installation and easier operation in a compact all-outdoor single integrated unit. Designed for network operators who require high-capacity bandwidth and carrier-grade availability, this native Ethernet microwave backhaul is a highly-flexible easy-to-use solution with superior performance and fast ROI.

### Benefits

- » Low cost of ownership fast ROI relative to fiber and other options
- » No right-of-way issues, unlike fiber deployment
- » All-Outdoor integrated design carries benefits of higher throughput speeds, greater system efficiency, simpler installation and operation, and significant cost savings
- » Excellent system gain for longer range and higher availability
- » Replace leased lines, eliminate recurring costs
- » Rapid scalability, easily add bandwidth and extend reach

### Easy Setup and Deployment

- » Simplified installation and operation
- » Easy alignment via real-time digital RSSI LED indicators
- » Minimal maintenance, "set and forget"
- » Easily upgrade throughput *as you need it*, with no hardware replacements and no forklift upgrades
- » Pay-as-you-grow 2-tier throughput upgrade path: Basic Package, and License Key 1

### Highlights

- Up to 520+ Mbps (260+ Mbps full duplex)
- Hitless Adaptive Modulation
- Ultra low latency, <150  $\mu$ S, for *triple play* applications
- All-outdoor integrated radio and modem
- Supports FCC, IC, and ETSI channel sizes of 10, 20, 28, 30, and 40 MHz<sup>†</sup>
- Standard 2-year manufacturer warranty

### Flexibility & Performance

- » High spectral efficiency of up to 7.5 bits/Hz
- » LDPC (Low Density Parity Check) for improved receive sensitivity
- » Port Priority assignment (VLAN) and QoS features
- » Power-over-Ethernet (PoE) or direct power, -48 Volt
- » GigE copper interface data port, PoE capable
- » Fast Ethernet copper management port, PoE capable
- » GigE optical/fiber interface data port
- » Fast modulation shifting
- » Supports jumbo packets in GigE mode
- » Flexible modulations, bandwidth and throughput controls

### Fail Safe Features for High Reliability

- » Supports Hot Standby for protection against equipment failure
- » Supports full link redundancy, 1+1 protection
- » Supports ring/mesh/star topologies with *Rapid Port Shutdown*

### Management

- » In-band management and out-of-band management
- » Network management through SSH, SNMP, and HTTP browser
- » Built in loop back and far end monitoring

### Specifications

RADIO PARAMETERS		Band 1		Band 2		
Frequency of Operation (ODU) †	FCC/IC (490 MHz duplex spacing)	<b>Band 1A:</b> 10.715 to 10.945 GHz <b>Band 1B:</b> 11.215 to 11.435 GHz		<b>Band 2A:</b> 10.955 to 11.185 GHz <b>Band 2B:</b> 11.445 to 11.685 GHz		
	ETSI (490 MHz duplex spacing)	<b>Band 1A:</b> 10.715 to 10.945 GHz <b>Band 1B:</b> 11.215 to 11.435 GHz		<b>Band 2A:</b> 10.955 to 11.185 GHz <b>Band 2B:</b> 11.445 to 11.685 GHz		
Channel Size ‡	10 MHz / 20 MHz / 28 MHz / 30 MHz / 40 MHz					
RF Power Output (max per modulation)	<b>QPSK</b>	<b>16QAM</b>	<b>32QAM</b>	<b>64QAM</b>	<b>128QAM</b>	<b>256QAM</b>
	+22 dBm	+22 dBm	+22 dBm	+21 dBm	+20 dBm	+19 dBm
Modulation Format	Selectable from QPSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM					
Receiver Sensitivity	-67 dBm (256 QAM maximum speed); -91 dBm (QPSK minimum speed)					
Features	ATPC (Automatic Transmit Power Control), Modulation Shifting, LDPC (Low Density Parity Check) Forward Error Correction					
Regulatory Compliance ‡	FCC/ANSI: Part 101, Part 15 Class B Unintentional Radiator <b>Industry Canada (IC):</b> SRSP-310.7 Issue 2 ETSI: EN 302 217-2-1 (System Dependent) Class 5B-1, EN 302 217-2-2 (Essential Requirements) Class 5B-1					

DATA							
Data Throughput/RSSI (1E10 <sup>-6</sup> BER) ‡	Speeds are uni-directional. For aggregate full duplex speeds, multiply numbers below by 2.						
<b>Legend</b> Basic Package = 110 Mbps maximum License Key 1 = 263 Mbps maximum *	<b>Channel Size</b>	<b>QPSK / RSSI</b>	<b>16QAM / RSSI</b>	<b>32QAM / RSSI</b>	<b>64QAM / RSSI</b>	<b>128QAM / RSSI</b>	<b>256QAM / RSSI</b>
	10 MHz	15 Mbps / -91 dBm	30 Mbps / -84 dBm	38 Mbps / -81 dBm	47 Mbps / -78 dBm	N/A	N/A
	20 MHz	32 Mbps / -88 dBm	63 Mbps / -81 dBm	79 Mbps / -78 dBm	98 Mbps / -75 dBm	115 Mbps / -72 dBm	N/A
	28 / 30 MHz	44 Mbps / -86 dBm	89 Mbps / -80 dBm	110 Mbps / -76 dBm	138 Mbps / -74 dBm	162 Mbps / -71 dBm	188 Mbps / -68 dBm
	40 MHz	64 Mbps / -85 dBm	128 Mbps / -79 dBm	153 Mbps / -75 dBm	198 Mbps / -72 dBm	234 Mbps / -69 dBm	263 Mbps / -67 dBm
Packet Size	64-9600 bytes						
Flow Control	Yes, via Ethernet pause frames (GigE mode only)						
Security	Authentication uses 2 level password						
Configuration & Management	SSH, HTTPS, Ethernet, SNMPV2						
Remote firmware update	TFTP client in radio unit						
<b>ANTENNA</b>	<b>Model/Description</b>	<b>Gain</b>			<b>3 dB Beamwidth</b>		
Antenna options	AD11G-2 / 2-foot antenna with slip-fit mount	33.4 dBi mid-band			3.4°		
	AD11G-3 / 3-foot antenna with slip-fit mount	37.1 dBi mid-band			2.6°		
	AD11G-4 / 4-foot antenna with slip-fit mount	40.4 dBi mid-band			1.7°		
	AD11G-6 / 6-foot antenna with slip-fit mount	43.8 dBi mid-band			1.1°		
<b>POWER</b>							
Input	-40.5 to -57 VDC						
Power Consumption	48 Watts						
<b>MECHANICAL &amp; ENVIRONMENTAL</b>							
Enclosure	Cast Aluminum with RSSI window						
Indicators	2-digit LED "in dBm" RSSI indicator for alignment						
Dimensions	12 x 12 x 6.8 inches (height x width x length)						
Weight	18 lbs						
Temperature Range	-40° to 131° F (-40° to +55° C)						
Humidity	100% condensing						
Interfaces	1 GigaEthernet port, RJ45 (10/100/1000 BaseT), PoE capable 1 Fiber Optic port (SFP Module required) 1 Ethernet management port, RJ45 (10/100 BaseT), PoE capable						
Power connector	Power-over-Ethernet / 2 pin Molex connector						
Redundancy (1+1)	6 pin circular						
Antenna Connector	Slip-fit mount / Optional waveguide adapter: WR90 / UBR100						

\* Based on purchasable Option Key. Contact sales for more information.

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



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