Innovating Microwave Backhaul™

POINT-TO-POINT

TrangoLINK Apex 23™ 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 23 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 3-tier throughput upgrade path: Basic Package, License Key 1, and License Key 2

Highlights

- Up to 730 Mbps (365 Mbps full duplex)
- Hitless Adaptive Modulation
- Ultra low latency, <150 µS, for *triple play* applications
- All-outdoor integrated radio and modem
- Supports FCC, IC, and ETSI channel sizes of 10, 20, 28, 30, 40, 50, and 56 MHz ‡
- 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

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All-Outdoor Point-to-Point Microwave Backhaul

Specifications

RADIO PARAMETERS						
Frequency of Operation (ODU) ‡	**FCC/IC** (1200 MHz duplex spacing)		***Band 2A:*** 21.800 to 22.395 GHz		***Band 2B:*** 23.000 to 23.595 GHz	
	ETSI (1008 MHz duplex spacing)		***Band 2A:*** 22.015 to 22.358 GHz		***Band 2B:*** 23.023 to 23.366 GHz	
Channel Size ‡	10 MHz / 20 MHz / 30 MHz / 40 MHz / 50 MHz / 56 MHz					
RF Power Output (max per modulation)	**QPSK**	**16QAM**	**32QAM**	**64QAM**	**128QAM**	**256QAM**
	+20 dBm	+19 dBm	+18 dBm	+17 dBm	+16 dBm	+15 dBm
Modulation Format	Selectable from QPSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM					
Receiver Sensitivity	-65 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 **Industry Canada (IC):** SRSP-321.8 Issue 2 **ETSI:** EN 302 217-2-1 (System Dependent) Class 6A, EN 302 217-2-2 (Essential Requirements) Class 6A, ITU-R F.637-3					

DATA

Data Throughput/ RSSI (1E10^{-6} BER) ‡

Speeds are uni-directional. For aggregate full duplex speeds, multiply numbers below by 2.

Channel Size	QPSK / RSSI	16QAM / RSSI	32QAM / RSSI	64QAM / RSSI	128QAM / RSSI	256QAM / RSSI
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
50 MHz	75 Mbps / -85 dBm	143 Mbps / -78 dBm	187 Mbps / -74 dBm	232 Mbps / -71 dBm	274 Mbps / -68 dBm	315 Mbps / -65 dBm
56 MHz	89 Mbps / -83 dBm	178 Mbps / -77 dBm	223 Mbps / -73 dBm	277 Mbps / -71 dBm	327 Mbps / -68 dBm	365 Mbps / -65 dBm

Legend

Basic Package = 110 Mbps maximum
License Key 1 = 198 Mbps maximum *
License Key 2 = 365 Mbps maximum *

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			
ANTENNA	**Model/Description**		**Gain**	**3 dB Beamwidth**
Antenna options	AD23G-1 / 1-foot antenna with slip-fit mount		35.1 dBi mid-band	2.7°
	AD23G-2 / 2-foot antenna with slip-fit mount		40.2 dBi mid-band	1.7°
	AD23G-3 / 3-foot antenna with slip-fit mount		43.7 dBi mid-band	1.1°
	AD23G-4 / 4-foot antenna with slip-fit mount		46.2 dBi mid-band	0.8°
POWER				
Input	-40.5 to –57 VDC			
Power Consumption	48 Watts			
MECHANICAL & ENVIRONMENTAL				
Enclosure	Cast Aluminum with RSSI window			
Indicators	2-digit LED "in dBm" RSSI indicator for alignment			
Dimensions	12 × 12 × 6.8 inches (height × width × length)			
Weight	18 lbs			
Temperature Range (operational)	-40° to 131° F (-40° to +55° C)			
Humidity	100% condensing			
Interfaces	1 GigaEthernet port, RJ45 (10/100/1000 BaseT) 1 Fiber Optic port (SFP Module required) 1 Ethernet management port, RJ45 (10/100 BaseT)			
Power connector	Power-over-Ethernet / 2 pin Molex connector			
Redundancy (1+1)	6 pin circular			
Antenna Connector	Slip-fit mount / Optional waveguide adapter: WR42 / UBR220			

* 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.

CE RoHS Compliant

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