



Carrier Class Licensed Microwave Backhaul Solutions

*High-Capacity Point-to-Point
Native Ethernet Wireless Networks*

- » **TrangoLINK Giga®**
Licensed Split Architecture Microwave Backhaul
- » **TrangoLINK® Apex**
Licensed All-Outdoor Microwave Backhaul
- » **TrangoLINK-45™**
Unlicensed Microwave Wireless Bridge

The ultimate solution for fixed and mobile backhaul transport is highly scalable, flexible, economical, easy to deploy, and extremely fast with minimal latency—Trango microwave backhaul products embody all of these qualities and more.

Trango backhaul equipment is your ultimate solution for microwave point-to-point wireless connectivity.



LICENSED MICROWAVE BACKHAUL

TrangoLINK Giga®

Split-Architecture Licensed Backhaul

- » Up to **620+** Mbps throughput
- » Ultra low latency, **<100 μS**, for video, VoIP and data *triple play* applications
- » 4 GigE IP ports, 8 T1/E1 TDM ports, for easy TDM to IP migration and mixed traffic
- » Support for FCC, IC, and ETSI standards

TrangoLINK Giga® supports all types of TDM and Ethernet/IP traffic, making it ideal for mixed traffic, OC3 replacement, or an easy all-IP migration. Designed from the ground up for high-capacity cellular/WiMAX/WISP backhaul, public and private networks, and LAN extensions, TrangoLINK Giga® delivers industry-leading latency, unequaled flexibility, carrier-grade reliability and unmatched economics.

6 GHz – TrangoLINK Giga® 6

- » Up to **330+** Mbps throughput (**165+** Mbps Full Duplex)
- » Supports channel sizes 10, 28, and 30 MHz
- » Full Capacity out of the box, no option key necessary

10 / 11 GHz – TrangoLINK Giga® 11

- » Up to **480+** Mbps throughput (**240+** Mbps Full Duplex)
- » Supports channel sizes 10, 20, 28, 30 and 40 MHz

15 GHz – TrangoLINK Giga® 15

- » Up to **480+** Mbps throughput (**240+** Mbps Full Duplex)
- » Supports channel sizes 10, 20, 28, 30 and 40 MHz

18 GHz – TrangoLINK Giga® 18

- » Up to **620+** Mbps throughput (**310+** Mbps Full Duplex)
- » Supports channel sizes 10, 20, 27.5, 30, 40, 50, 55, and 56/80 MHz

23 GHz – TrangoLINK Giga® 23

- » Up to **620+** Mbps throughput (**310+** Mbps Full Duplex)
- » Supports channel sizes 10, 20, 28, 30, 40, 50, and 56 MHz



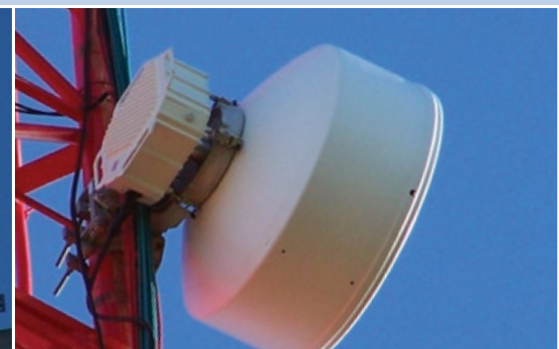
IP/TDM Mixed Traffic Ultimate Flexibility

- » Native Ethernet and native TDM
- » Ideal for Ethernet backhaul and TDM to IP migration
- » Four configurable GigE ports (10/100/1000 BaseT) for payload
- » GigE ports have port priority assignment (VLAN) and QoS features supporting eight priorities and four queues
- » Eight T1/E1 ports with data stream auto add/drop
- » All ports are port-mapped and operate simultaneously

TrangoLINK Giga® &

Shared Features

- » Real-time digital LED RSSI indicators
- » Flexible modulation settings for greater spectral efficiency
- » Fast modulation shifting
- » Ethernet native for optimal network scalability
- » Supports jumbo packets in GigE mode
- » Port Priority assignment (VLAN) and QoS features
- » Supports hot standby, link redundancy, 1+1 protection
- » Supports ring/mesh/star network topologies, with RPS
- » Excellent system gain for longer range, higher availability
- » In-band management and out-of-band management
- » Network management via SSH, SNMP, and HTTP browser



TrangoLINK® Apex

All-Outdoor Licensed Backhaul

- » Up to **750** Mbps throughput
- » Ultra low latency, **<100 μS**, for *triple play* bandwidth-intensive applications
- » All-outdoor integrated radio and modem design for zero footprint installation
- » Support for FCC, IC, and ETSI standards

TrangoLINK® Apex delivers high-capacity carrier-grade availability, superior performance and fast ROI in a compact all-outdoor radio. This highly-flexible native Ethernet backhaul solution is the only licensed microwave All-Outdoor Unit (AOU) offering these market-exclusive features:

- » Hitless Adaptive Modulation
- » True hot standby 1+1 link protection with Rapid Port Shutdown
- » Real-time digital LED RSSI indicator
- » Optical/fiber data interface
- » 2 data ports with a separate management port



Flexibility & Performance

- » High spectral efficiency of up to 7.5 bits/Hz
- » LDPC (Low Density Parity Check) for improved receive sensitivity
- » 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
- » Flexible modulations, bandwidth and throughput controls
- » 3-tier upgrade path for pay-as-you-grow OPEX efficiency

10 / 11 GHz – TrangoLINK® Apex 11

- » Up to **520+** Mbps throughput (**260+** Mbps Full Duplex)
- » Supports channel sizes 10, 20, 28, 30 and 40 MHz

15 GHz – TrangoLINK® Apex 15

- » Up to **480+** Mbps throughput (**240+** Mbps Full Duplex)
- » Supports channel sizes 14, 20, 28 and 40 MHz

18 GHz – TrangoLINK® Apex 18

- » Up to **750+** Mbps throughput (**375+** Mbps Full Duplex)
- » Supports channel sizes 10, 20, 27.5, 30, 40, 50, 55, and 56/80 MHz

23 GHz – TrangoLINK® Apex 23

- » Up to **750+** Mbps throughput (**375+** Mbps Full Duplex)
- » Supports channel sizes 10, 20, 28, 30, 40, 50, and 56 MHz

& TrangoLINK® Apex

Shared Benefits

- » Standard 2-year manufacturer warranty
- » Low cost of ownership and rapid return on investment
- » Easiest link alignment in the industry
- » Replace leased lines, eliminate recurring costs
- » Rapid scalability, easily add bandwidth and extend reach
- » Saves thousands of dollars with simplified infrastructure, eliminate many typical networking devices

Easy Throughput Upgrades (11, 18 and 23 GHz)

- » Basic unit includes 100+ Mbps; software upgradeable
- » Easily upgrade speed via software license Option Key with no hardware replacements and no forklift upgrades



TrangoLINK-45™

45 Mbps OFDM Multi-band 5.x GHz
Wireless Ethernet Bridge

5.2 GHz, 5.3 GHz, 5.4 GHz, 5.8 GHz

- » Up to **45 Mbps** usable data throughput
- » Multi-band versatility in the convenience of one radio
- » Quality of Service (**QoS**) and **VLAN** support
- » Up to **45-mile** range (72 km) with external antenna
- » Orthogonal Frequency Division Multiplexing (OFDM)
- » Adaptable Rate Modulation
- » Supports FCC, IC, and ETSI standards



Industry-Best Interference Mitigation

- » Built-in *Auto RF RX Threshold* for superior interference mitigation—maintains superb link integrity in high noise floor
- » Dynamic Frequency Selection (DFS) in 5.3/5.4 GHz
- » Forward Error Correction (FEC), Automatic Repeat Request (ARQ), Automatic Transmit Power Control (ATPC)

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

Trango Support

We are committed to ensuring successful installation and operation of every Trango link deployed. Our trained staff of microwave engineering professionals are available to provide pre- and post-sales consulting and support services.

- » Free technical support via telephone and email
- » Path profile and radio planning services utilizing sophisticated RF Planning tools
- » Complete line of accessories available direct from Trango (cables, antennas, power supplies, wave guides, etc.)
- » Technical training/certification programs
- » Extended warranties
- » After hours technical support
- » Hot Swap and Spare programs
- » Online Resources (technical manuals, white papers, etc.)
- » Emergency and scheduled On-site Support

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Ultimate Wireless Connectivity