

# Tropos 4310 Mobile Mesh Router



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The 4310 Mobile Mesh Router interoperates seamlessly with Tropos fixed routers to deliver a robust, high-performance wireless connectivity solution for mobile workers. At vehicular speeds, the Mobile Router supports voice, video, and data connectivity and extends the Tropos fixed network to provide access for handhelds, laptops, and other endpoint devices.

## FEATURES AND BENEFITS

### Software

- ❖ Routing algorithms optimized for mobility provide connectivity at vehicular speeds
- ❖ Maximizes performance to automatically find optimum end-to-end paths across the network
- ❖ Graceful handoffs prevent service disruptions to latency-sensitive voice, video, and VPN connections
- ❖ Sub-second handoffs across multiple available wireless channels
- ❖ Creation of standalone mobile networks in areas where coverage is unavailable

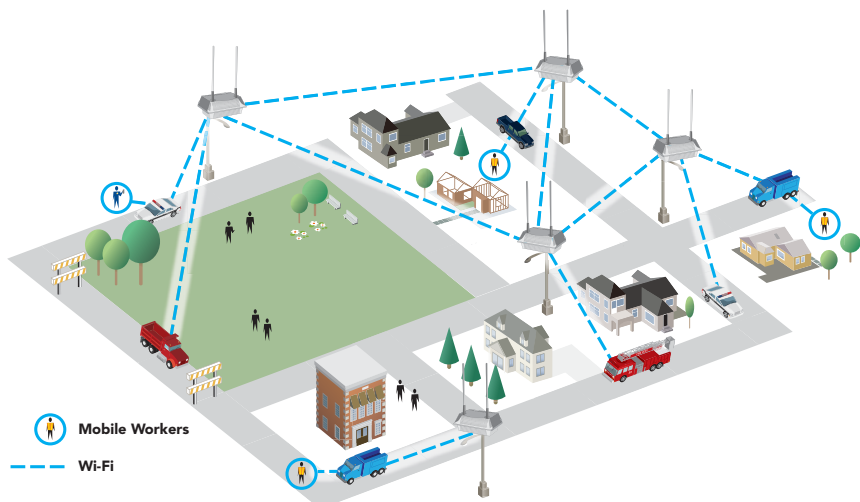
### Platform

- ❖ Intelligent 2.4 GHz mobile node supports 802.11b/g mesh and client connectivity
- ❖ Best-in-class link budget for superior RF propagation
- ❖ Vehicle-mounted with integrated high-power radio
- ❖ FIPS 140-2 compliant

An easily-deployed solution for increasing the productivity of mobile workforces, the Tropos 4310 Mobile Mesh Router enables any vehicle to become a mobile node. Typical applications include extending coverage within cities and across regions to support mobile field workers. This includes utility crews, first responders, building inspectors and animal control – all of whom benefit by having high-speed access to information and being able to file reports from the field. When deployed in military vehicles or industrial environments such as ports or mining operations, the mobile router improves operational efficiencies and enhances communications..

Tropos Mobile Routers also support the creation of tactical mesh zones, an empowering solution for emergency response teams or military tactical teams. Multiple vehicles equipped with mobile routers can mesh with one another to create a standalone peer-to-peer network capable of increasing tactical effectiveness through enhanced communication. Even if the response team is operating in a rural region that does not have access to the fixed Tropos network, the team member vehicles still benefit from enhanced communication capabilities to coordinate their efforts.

When stationary, the mobile-node equipped vehicle uses its high-power and high-sensitivity 2.4 GHz radio to provide connectivity to authorized handheld and laptop users within a three-mile radius (depending on the environment).



## PWRP

The cornerstone of the Tropos Mesh OS is the patented Predictive Wireless Routing Protocol (PWRP™), which continually analyzes the quality of active and inactive mesh links to dynamically configure the ideal combination of paths to optimize network performance. Upon deployment, the routers automatically discover one another, and quickly determine the optimal route to the gateways that inject capacity into the network. Optimal links are chosen on the basis of throughput, packet success, signal-to-noise ratios, and other key criteria.

PWRP performs a range of key tasks across the wireless network:

- ❖ Streamlines deployments and preserves performance by dynamically configuring and optimizing mesh connections
- ❖ Improves overall throughput by selecting optimal routing paths
- ❖ Enhances network resiliency by providing graceful rerouting of traffic in the event of RF interference, backhaul failures, or other disruptions in the wireless mesh
- ❖ Supports client mobility without the need for special client hardware, software, or network reconfigurations
- ❖ Enables the network to be scaled to thousands of nodes covering the largest geographical areas in the industry

## Tropos Mesh OS

The Tropos Mesh OS is the cornerstone of the decentralized Tropos System Architecture. A common software platform that runs on each router across the network, the Tropos Mesh OS leverages the router's on-board intelligence to monitor and maximize performance. Unlike controller-based architectures that suffer bandwidth losses as control traffic is passed back and forth between network nodes and the central site, the distributed Tropos MetroMesh System Architecture uses efficient on-board processing at the device level to minimize network congestion and adapt on a real-time, packet-by-packet scale. This distributed approach optimizes performance and throughput by minimizing control traffic, delivers a highly scalable solution, and helps provide a quality user experience for network clients.

## Advanced Network Management Platform Delivers Optimized Edge-to-Edge Visibility

Tropos Control is a standards-based network management system designed to achieve peak performance and reliability. Designed around an intuitive Web-based interface, the software facilitates the remote management of Tropos Mesh networks, and is ideal for dynamically deploying and configuring networks ranging in size from tens to thousands of Tropos Mesh routers. Tropos Control minimizes planning, deployment, and operating costs, and increases the efficiency of management personnel by performing complex tasks such as global provisioning and software updates across the network in a single session.

- ❖ Streamlines tasks such as monitoring network health, statistical network performance analysis, and performance optimization
- ❖ Provides macro-level visibility as well as granular real-time and historical detail on usage, link quality, capacity, and network reliability
- ❖ Network Health dashboard provides at-a-glance views of network traffic, performance, and alarms with links to instantly drill down to relevant statistical information
- ❖ Wireless-aware provisioning for guaranteed configuration changes and software updates over dynamically changing links
- ❖ Detailed historical database of RF environmental data, network performance, and client connectivity enables fast root-cause diagnosis
- ❖ Assists network managers to plan future expansions and optimization strategies based on analysis of network trends and detailed historical information

## Resilient, High-Performance Networks From Tropos – the Wireless IP Broadband Market Leader

As the leader in wireless IP broadband mesh networking solutions, Tropos is the right choice for organizations interested in deploying a robust infrastructure capable of withstanding the harshest outdoor environments. Designed to contain costs and enhance productivity, Tropos technology provides the backbone for top-performing outdoor wireless IP networks across the globe. As the industry continues to evolve, Tropos is poised to extend its market leadership through the introduction of innovative products, and functionality. For further information, visit us on the web at [www.tropos.com](http://www.tropos.com).

### Wireless

- IEEE 802.11b/g
- Frequency band: 2.4-2.483 GHz
- Modulation: 802.11g - OFDM (64-QAM, 16-QAM, QPSK, BPSK) 802.11b - DSSS (DBPSK, DQPSK, CCK)
- TX Power: 36dBm (EIRP)
- Media Access Protocol: CSMA/CA with ACK
- RX Sensitivity:

-100dBm @ 1 Mbps	-92dBm @ 12 Mbps
-95dBm @ 2 Mbps	-89dBm @ 18 Mbps
-93dBm @ 5.5 Mbps	-86dBm @ 24 Mbps
-91dBm @ 11 Mbps	-83dBm @ 36 Mbps
-94dBm @ 6 Mbps	-78dBm @ 48 Mbps
-93dBm @ 9 Mbps	-76dBm @ 54 Mbps
- Transmit and receive diversity

### Networking

- TCP and VPN session persistent roaming across subnets
- Mobile tactical mesh operating mode
- Full 802.11b/g client compatibility
- 802.1q VLAN support
- Support for static and dynamic addressing for wireless and wired clients
- Layer 2 and Layer 3 support
- DHCP Server and Relay
- NAT support
- Plug & Play Wired client support
- Two (2) 10/100 Base-T Ethernet ports (Management and CPE connection)
- 802.11e WMM QoS support
- 802.1p/q with 4 queues per VLAN and ESSID
- Two (2) Type-A USB ports
- Console port (for factory use) and Serial port

### Management

- RADIUS Accounting
- Secure Local and Remote Management Tools via HTTPS
- Configuration Save and Restore
- Software Upgrades with Rollback
- Command Line Interface (CLI) via SSH
- SNMP (standard MIBs and Tropos MIB)
- Wireless, Network and Client Monitoring, Statistics and Wireless capture capabilities

### Security

- Authentication: WPA, WPA2, 802.11i, RADIUS, 802.1x (includes EAP-TLS, EAPTTLS, EAP-SIM, PEAP)
- Encryption: Open, WEP, AES-CCM, TKIP
- Hardware assisted encryption
- AES encryption of mesh and control traffic
- Multiple BSSIDs & ESSIDs (ESSID suppression)
- Full VPN compatibility (VPN filtering)
- Password and Certificate-based HTTPS and SSH Remote Access
- Packet Filtering & Forwarding
- Client Access Control Lists
- Router Access Control
- Evil Twin Detection and Reporting
- Denial of Service Attack Detection
- Tamper-Evident Seals
- FIPS 140-2 compliant

### Environmental Specifications

- Operating temperature range: -40°C to 70°C
- Storage temperature range: -40°C to 85°C
- Shock & vibration: MIL-STD-202E, Method 204C
- Humidity range: 10-95% non-condensing
- IP Level 21

### Optional Accessories

- Antenna kit: one (1) 7.4dBi flexible spring base omni-directional antenna, mobile mount bulkhead or magnetic mount N-connector, 12' of low-loss antenna cable
- Antenna kit: one (1) 5.0dBi omni-directional antenna, mobile mount bulkhead or magnetic mount N-connector, 12' of low-loss antenna cable
- GPS receiver with external puck antenna

### Mounting Options

- Vehicle mounted in protected area such as trunk or cargo space:
  - Vertical or horizontal mounting orientation

### Approvals

- FCC CFR 47 Part 15, Class B
- Industry Canada RSS 210
- UL 60950-1
- CSA 22.1 No. 950
- EN 60950
- IEC 950

### Hardware Specifications

- Autosensing 10/100 BaseT Ethernet
- Power input: 10.0 to 32.0VDC
- Power consumption: 8W typical
- Polarity protection
- Low voltage disconnect protection
- Automotive over-voltage protection, SAE J1211
- Automotive mini-blade fuse and socket, externally accessible
- Network status lamp
- Remote network status indicator
- Dimensions: 13.1 in (33.3 cm) wide x 7.91 in (20.1 cm) deep x 3.85 in (9.8 cm) high
- Weight: 9 lbs (6.35 kg) max., with mounting brackets

### Protection Circuits

- Antenna Protection:  $\leq 0.5\mu\text{J}$  for 3kA @ 8/20 $\mu\text{S}$  Waveform
- Electrical Protection:
  - EN61000-4-5 Level 4 AC Surge Immunity
- Data Protection:
  - EN61000-4-2 Level 4 ESD Immunity

### Warranty

- One (1) year on parts and labor; return to point of purchase
- Optional standard and premium support packages available

### Package Contents

- Tropos 4310
- Mounting bracket and accessories
- Hardware Installation and Quick Start Guides

### Ordering Information

**Part Number: 43102100**  
**Tropos 4310 mobile router, variable power; N-connectors, bracketry**

**Part Number: AN074090**  
**One (1) vehicle mounted 7.4dBi omni antenna and cable kit, bulkhead mount**

**Part Number: AN074091**  
**One (1) vehicle mounted 7.4dBi omni antenna and cable kit, magnetic mount**

**Part Number: AN050090**  
**One (1) vehicle mounted 5.0dBi omni antenna and cable kit, bulkhead mount**

**Part Number: AN050091**  
**One (1) vehicle mounted 5.0dBi omni antenna and cable kit, magnetic mount**

**For additional configuration options please contact your Tropos Representative**



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