MeshX Nodes™

Self-Organizing Edge Intelligence

> *"Intelligence at the edge, performance at the core"*

Product Overview

MeshX Nodes represent the future of intelligent network infrastructure, combining edge AI processing with advanced wireless technologies to create self-organizing, self-healing mesh networks. These autonomous nodes continuously optimize network topology, intelligently route traffic, and provide predictive maintenance alerts, all while delivering exceptional performance across challenging environments.

Key Features

🤖 Self-Organizing Intelligence

- Autonomous topology discovery and optimization
- Self-healing mesh with dynamic path recalculation
- AI-driven signal optimization for maximum coverage
- Zero-touch provisioning with instant mesh integration

🧠 Edge AI Processing

- On-device neural processing for local intelligence
- Real-time data analysis without cloud dependence
- Predictive analytics for proactive management
- Federated learning across distributed nodes

📡 Advanced Connectivity

- Multi-band operation (Sub-6 GHz, 5G, mmWave)
- Dynamic spectrum utilization with interference avoidance
- Beamforming technology with spatial multiplexing
- Seamless failover with sub-millisecond recovery

📊 Predictive Maintenance

- Autonomous health monitoring with self-diagnostics
- Predictive failure alerts with specific component identification
- Energy consumption optimization based on workload
- Environmental adaptation for harsh conditions

Technical Specifications

Feature	Specification
Radio Technology	Wi-Fi 6E/7, 5G NR, LoRa, BLE 5.3
AI Processor	Neural Engine with 12 TOPS processing power
Range	Up to 500m outdoor, 150m indoor
Throughput	Up to 7.2 Gbps aggregate per node
Mesh Capacity	Up to 256 nodes per network segment
Power Options	PoE++, DC, Solar, Battery backup (48h)
Management	Cloud-based, autonomous, or hybrid
Environmental	IP68, -40°C to +85°C operating range

Deployment Scenarios

Smart Buildings and Campuses

Deploy intelligent mesh networks across buildings and campuses, enabling smart space applications with consistent coverage and edge intelligence for real-time analytics.

Industrial IoT Networks

Create resilient networks in challenging industrial environments with predictive maintenance, sensor integration, and real-time process monitoring capabilities.

Smart City Infrastructure

Extend intelligent connectivity across urban environments, supporting IoT sensors, public safety applications, and citizen services with reliable, self-healing infrastructure.

Remote Operations

Enable connectivity in remote locations, disaster recovery scenarios, or temporary deployments with rapid setup and autonomous operation requiring minimal oversight.

ROI Impact

- **83%** reduction in network deployment time
- **67%** decrease in connectivity-related downtime
- **41%** lower power consumption through intelligent management
- **92%** reduction in on-site maintenance visits

Advanced Capabilities

Environmental Adaptation

MeshX nodes automatically adjust power, frequency, and transmission parameters based on environmental conditions, optimizing performance in changing scenarios.

Spatial Intelligence

Built-in AI models understand three-dimensional spaces, enabling optimal node placement, signal propagation, and interference avoidance through advanced spatial awareness.

Edge Analytics Platform

Deploy edge applications directly to MeshX nodes, enabling real-time analytics, computer vision, and local decision-making without cloud dependency.

MeshX Intelligence Dashboard

Our intuitive management dashboard provides comprehensive visibility:

- **Mesh Topology Visualization** - Real-time 3D visualization of your entire mesh network
- **Predictive Analytics** - Forecasting of potential issues before they impact service
- **Autonomous Action Log** - Complete transparency of self-optimization decisions
- **Performance Heatmapping** - Spatial representation of coverage quality and user experience

Compliance & Certification

- EU AI Act Compliant
- SOC2 Type II Certified
- ISO 27001 Certified
- IP68 Environmental Rating
- UL 2900-1 Cybersecurity Certified
- GDPR Compliant
