



Grid Solutions
a GE and Alstom joint venture

TELECOMMUNICATIONS PRODUCT SOLUTIONS

Wavecom

Wireless mesh routers

ROBUST wireless routers designed to work under harsh conditions commonly found on substations and industrial applications.



Meshed radio networks for smart applications

The **Wavecom** wireless router is a powerful radio system for meshed radio networks and access links. The embedded technology offers high speed data rates and very low latency, simultaneously allowing critical services and multimedia applications with plug-and-play deployment.

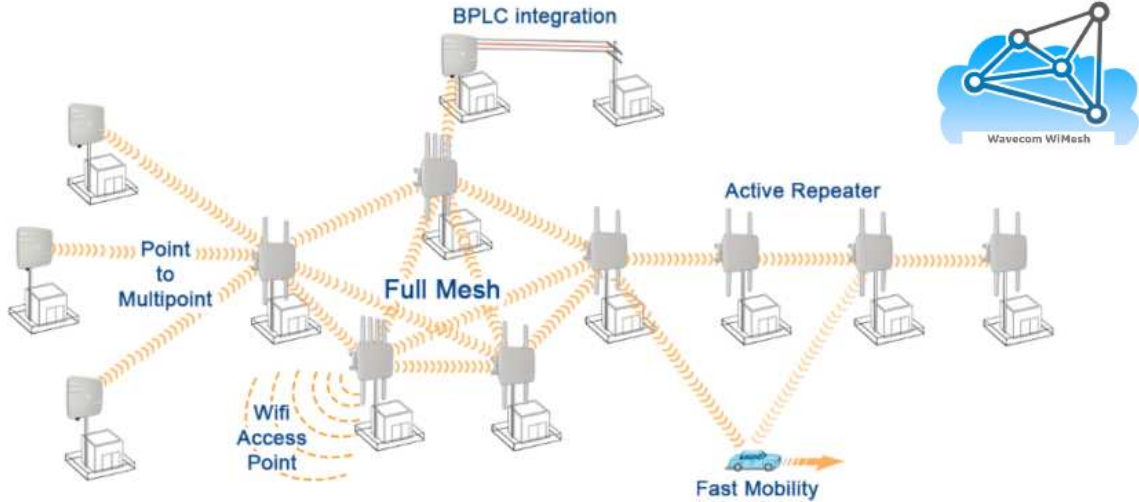
CUSTOMER BENEFITS

- Large bandwidth and low latency radio for critical applications with plug-and-play deployment
- Build from large scale meshed networks to simple point-to-point using the same device
- High resilience private distributed network with no down-time, no single point of failure, no carrier fees or subcontractor dependency
- Attain longer distances in obstructed areas thanks to multiple independent radios as active low-latency repeaters
- Full integration with other Grid Solutions distribution solutions like **Powercom BPL** and **Sentinel** network manager.

KEY FEATURES

- From full meshed architecture, point-multipoint to point-to-point link possibilities
- Dynamic real-time re-routing and network self-healing mechanism
- IP native in Layer-2 bridging or Layer-3 routed mode
- Up to three independent radio interfaces on the same device
- Software switchable bands in 2.4 GHz or 5 GHz in interface*
- High speed mobility handover with no service down-time*
- Embedded firewall, ACL and VPN client/server
- Standardized N-connector for wide range antennas*
- Local and remote management with Wavecom MeshTool
- Rugged and compact outdoor enclosure for harsh environmental conditions
- Single cable for power supply and Ethernet

* available on models **wavecom-D** and **wavecom-G**



FROM MESH NETWORKS TO POINT-TO-POINT

The system allows building from simple point-to-point to full meshed networks. In a mesh configuration, the network works in a dynamically distributed topology with real-time routing protocol.

The system uses standardized protocols such as OSPF, RSTP, VRRP, link aggregation and internal algorithms for attaining the maximum resilience and compatibility with other network elements.

EASY CONFIGURATION

Radios have a simple, user-friendly configuration and administration interface, facilitating the framework for large networks.

FREQUENCY BANDS

The three different **wavecom** platforms are equipped with one, two or three independent radio interfaces. The models D and G can operate on both 2.4 and 5 GHz frequency band, switchable by software.

FAST MOBILITY

The **wavecom-D** and **wavecom-G** have the capability to provide fast mobility links on speeds over 100 km/h with no disconnection or service interruption.

MIXED TECHNOLOGIES SOLUTION

As part of GE's telecommunications solution, its mesh radio technology is designed to work with broadband powerline communications and fiber optics, extending coverage, thus utilising the best of each technology. Furthermore, it decentralises the data streams, balancing them over multiple paths, making the network more reliable and stable.

ANTENNA COMPATIBILITY

The **wavecom-S** has one built-in high gain MIMO patch antenna for easy installation. The **wavecom-D** and **G** have standardised cable N-connectors for omnidirectional, patch or high-gain antennas, all adapted to various field conditions.

SECURITY

The wireless routers provide cutting-edge encryption scheme AES 128 bits WPA2-PSK, VPN, Access Control List (ACL), IEEE 802.1X and each link can be configured with different dynamic keys to assure strong protection against cyber-attacks and data snooping.

WEATHER PROOF

The devices are equipped with ruggedised enclosures, Ingress Protection (IP) level certified, allowing it to be installed in severe weather conditions, but at the same time, compact and lightweight simplifying the infrastructure.



Wavecom-S

Compact wireless router with built-in MIMO dual-polarisation antenna suitable for access-point and point-to-point links.

- One 5 GHz high sensitivity MIMO interface
- Up to 100 Mbps net throughput
- Built-in dual polarisation 18 dBi patch antenna
- Layer-2 bridging or Layer-3 routing network
- Advanced networking with VRRP, NAT, DHCP, QoS enhanced security with ACL, 802.11x, DSCP
- Compact and light design with IP-65 outdoor enclosure
- Wavecom OS embedded for mixed architectures and real-time routing
- Low power consumption

Wavecom-D

Full meshed outdoor wireless router with single or dual independent radios in 2.4 GHz or 5 GHz, switchable by software for fixed and fast moving links

- One or two independent MIMO radio interfaces
- Up to 100 Mbps net throughput per interface
- Dual band interfaces in 2.4 GHz or 5 GHz software selectable
- Layer-2 bridging or Layer-3 routing network
- Up to four standard N-connectors for antennas
- Advanced networking with VRRP, NAT, DHCP, QoS, VLAN enhanced security with ACL, 802.11x, DSCP
- Independent encryption for each radio link
- VPN server and client
- Fast mobility and handover up to 150 km/h
- Rugged and compact IP-67 outdoor enclosure

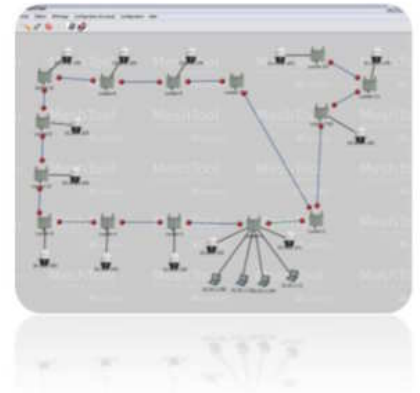
Wavecom-G

Gigabit full mesh wireless router with two or three independent radios in 2.4 GHz or 5 GHz, switchable by software for fixed and fast moving links

- Two or three independent MIMO radio interfaces
- Up to 150 Mbps net throughput per interface
- Dual band interfaces in 2.4 GHz or 5 GHz software selectable
- Two Gigabit Ethernet ports with link aggregation
- PoE+ standard power supply
- Up to six standard N-connectors for antennas
- Layer-2 bridging or Layer-3 routing network
- Advanced networking with VRRP, NAT, DHCP, QoS, VLAN enhanced security with ACL, 802.11x, DSCP
- Independent encryption for each radio link
- WiFi access point infrastructure
- VPN server and client
- Fast mobility and handover up to 150 km/h
- Rugged and compact IP-67 outdoor enclosure

WAVECOM MESHTOOL

No matter how complex the network, this tool is designed to manage all radio networks, to make configuration, supervision and provisioning in an easy way. With this user-friendly graphical interface, in few clicks, the operator is able to do network discovery, thus displaying the complete network, identifying all nodes, their applications and their status at a glance.



Cooperation with Sentinel

To have complete supervision and control of the GE telecom solution, the **Sentinel** software can be simultaneously deployed, enabling a global view of all network elements, separating them by class of services, layers and different groups, converging all useful information coming from all platforms in one screen.

WAVECOM ANTENNAS AND ACCESSORIES

As part of the **Wavecom** family, a wide range of antennas and accessories are available, such as:

- Omnidirectional, patch and sector antennas
- Supports and pole mounts
- Power supplies and battery connectors
- Cables and connectors



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