

# WavePoint Broadband Wireless Solution

FreeWave's Comprehensive High-Speed  
Wireless M2M Communications Solution

## Solution Highlights

End to end private wireless broadband for control, monitoring, surveillance, and telemetry

Flexible high speed communications offers voice, video, and last mile infrastructure with point-to-point, point-to-multipoint, and mesh architectures

M2M and SCADA industrial applications for oil & gas, agriculture, utilities, defense, and local government

Real time data collection for industrial applications delivering over 200 Mbps with low latency

License-free operation in 900 MHz, 2.4 GHz, and 5 GHz spectrum bands

Seamlessly interfaces with a broad range of devices

Wi-Fi connectivity enhances field personnel productivity to perform over-the-air software upgrades, access databases and documentation, and solve problems from remote sites

Over the Air software upgrades and management

Optional backhaul using 3G mobile networks

Professional services available for network design, path studies, and on-site support

## What is WavePoint?

WavePoint® is FreeWave Technologies' comprehensive and versatile wireless M2M communications architecture that delivers secure, end-to-end, high-speed wired and wireless communications.

The flexible WavePoint platform is highly configurable and provides high data rates "over the air" and secure communications based on Ethernet and Internet standard protocols. WavePoint is architected to meet the most rigorous and demanding requirements in a wide range of applications where organizations need fast, secure data communications that extend from field locations into the back office.

With broadband wireless modules covering three ISM and U-NII bands – 900 MHz, 2.4 GHz, and 5 GHz, WavePoint data links operate in the band that best suits the application. WavePoint wireless links are carrier grade – secure, scalable, and self-healing. GPS synchronizes network time and identifies the location for fixed and mobile applications. Remote locations may be connected using 3G data service.

With WavePoint, device integration is truly "plug and play." It is purpose built to support any network infrastructure, provide remote video access, and empower multiple Ethernet and serial devices.

## Fast, Secure, and Flexible

The WavePoint network uses OFDM technology to deliver high-speed, scalable, secure wireless communications in license-free radio spectrum. It enables organizations to build and support both remote and enterprise network infrastructures by extending broadband connectivity in a multitude of ways, all from one unified and secure platform. WavePoint offers a wide array of modulation schemes and data rates, with the flexibility to meet your application needs. Path studies are essential to calculate the expected data rates for any given wireless link.

With support for multiple license-free spectrum bands, WavePoint is able to take advantage of each band's unique properties: 900 MHz has excellent propagation and penetrates foliage or buildings well, 2.4 GHz is available worldwide and is supported by almost all mobile devices, and 5 GHz offers unparalleled capacity and high gain limits for backbone utility. By combining these, WavePoint can deliver high capacity communications over long distances without the need for expensive, dedicated licensed spectrum

WavePoint base units offer a mix of Fast Ethernet and serial data ports, making it simple to interface with a broad range of wired host devices. It also future proofs the network as remote devices transition from serial to Ethernet communications.



# WavePoint: Broadband Wireless Solution



WavePoint 10e (Front Panel)

WavePoint isn't just fast and flexible – it's also highly secure. The system defends against unauthorized access using security protocols based on Advanced Encryption Standard (AES) to protect networks against intruders. It also lets operators define multiple classes of service so that mission-critical data receives priority over all other traffic.

## Modular Growth

The WavePoint network can grow organically to meet changing business needs. From a simple point-to-point link to a complex point-to-multipoint network, WavePoint units automatically find and remember their best path back to a central monitoring site using mesh technology. In the event of a failure, the WavePoint network self heals – finding alternative paths around the failure.

The modular nature of the WavePoint network comes from its major building blocks:

- **WavePoint 10e**, a flexible and configurable platform that supports multiple frequencies
- WavePoint 10e can be configured with up to four **WavePoint Radio Modules**, letting the system leverage multiple frequencies
- **WavePoint 20e**, a compact single radio, single port unit for remote end points

The 10e can also act as a relay point or as remote Wi-Fi hotspot. Personnel at remote sites can remain connected even while working on a well head or a remote pumping station, increasing their efficiency and effectiveness.

Where mobile wireless service exists at a site, remote WavePoint networks may even be deployed using 3G technology for backhaul connections.

## Applications and Benefits

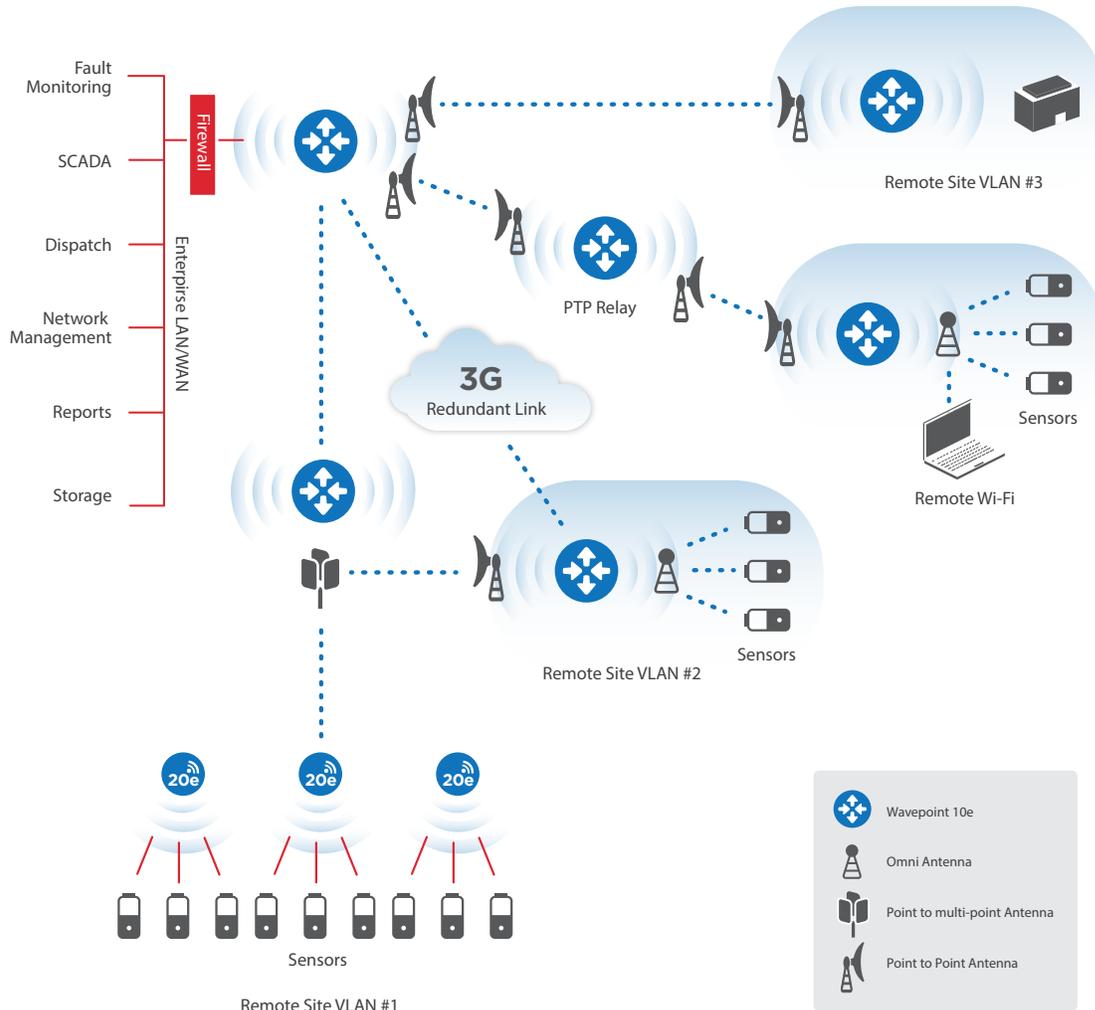
WavePoint offers capabilities that have only previously been available using high cost networking systems. Using WavePoint, businesses and government enterprises in fields such as local government, oil and gas, utilities, public safety, and defense can aggregate SCADA telemetry links over a single IP-based network.

WavePoint also offers additional capabilities such as video surveillance, letting dispatchers visually confirm a problem before dispatching a team.

## Antennas

WavePoint works with a variety of antennas, each optimized for a particular type of deployment. Your FreeWave representative can help you select the best antenna options for your deployment.

# WavePoint: Network Architecture



## Network Architecture

WavePoint networks are very flexible, permitting deployment in multiple architectures and using the unique advantages of each different RF band. Systems can be implemented point-to-point (PtP) over very long distances using highly directional dish antennas and low frequency spectrum, such as 900 MHz. Designers can take full advantage of the huge bandwidth available in the 5 GHz U-NII and ISM bands to deploy large scale, high capacity, point-to-multipoint (PtMP) networks – and mix and match PtMP and PtP links as needed.

A WavePoint network is self organizing, with each device finding its neighbors using mesh technology and setting up its own best routes back to the core. In the event of a failure along the route, the network will self heal, finding and using alternative paths until the failure is fixed.

The result is a highly flexible, very resilient, high-speed, secure network that supports the production needs of businesses and local governments and resists intrusion and interference.

# WavePoint: Configuration Options

	900MHz ISM	2.4GHz ISM	5GHz ISM & U-NII	3G Cellular	GPS	Ethernet Ports	Serial Ports	USB Ports	Enclosure	Operating Voltage
<b>WavePoint 10e</b>										
Standard Base	WP10e models have up to 4 broadband RF modules 900MHz, 2.4GHz, 5GHz and/or Cellular				Optional	4 x GigE	2 x RS-232 1 x RS-485	1 x Micro B	Aluminum	10.5 to 30VDC
Standard Outdoor					N/A	1 x GigE	1 x RS-232	N/A	Aluminum IP67	PoE+ 802.3at

<b>WavePoint 20e</b>										
Compact Base	WP20e models have a single broadband RF module 900MHz, 2.4GHz or 5GHz			N/A	N/A	2 x GigE	1 x RS-232	N/A	Aluminum	10.5 to 30VDC
Compact Embedded				N/A	N/A	2 x GigE	2 x RS-232	N/A	RF Module	5VDC
Compact OEM				N/A	N/A	2 x GigE	1 x RS-232	N/A	Board Set	10.5 to 30VDC

Some configuration restrictions apply, and some regions of the world cannot use certain frequencies.

# WavePoint: Applications



Oil and Gas



Agriculture



Utilities



Defense



SCADA



Mining



Fleet Management



Municipal



Enterprise

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