Xeta9 INS

900 MHz ISM

Intelligent Network Synchronizer

The XetaWave Intelligent Network Synchronizer, **INS**, offers a migration path from legacy **FreeWave** or **MicroHard** 900 MHz ISM technology to next generation, higher performing XetaWave technology. The INS allows for simultaneous operation of the legacy ISM network and a XetaWave ISM network, providing the ability to replace legacy technology over time. This migration path allows you to take advantage of the increased performance and capability of XetaWave's new generation of software defined radios while leveraging your existing investment.

XetaWave's **INS** synchronizes transmissions with a serial or Ethernet legacy Access Point or master radio, effectively overlaying a higher performance XetaWave network without interference. This capability enables you to maintain the usage of your legacy network while providing a transitional approach to network upgrades that is virtually non-intrusive when compared to a "rip and replace " upgrade.

Install the **INS** at the tower or master site and begin replacing the legacy remote or slave radios as time and budget permit. Once all legacy radios have been replaced, the **INS** can be upgraded to a standard Ethernet Xeta9 radio, thus completing the network upgrade.

Key Features

Affordable Provides an affordable path to migrate from legacy ISM networks as time and budget permit.

Re-Use Existing Antenna To support simultaneous operation of the legacy ISM network and XetaWave network.

IntelliSync Detects and intelligently synchronizes the frequency hopping to minimize interference between the two networks.

Configurable Simplify configuration with a common web UI.

Network Types Point to Point, Point to MultiPoint, Enhanced MultiPoint (**EMP**), and MESH.

Compatible Supports operations with serial FreeWave DGR, FGR, FGR2, and FGR3 radios, Ethernet FreeWave FGR2 and HT Plus radios, and MicroHard IPn920 radios.

Diagnostics Monitoring of TX and RX statistics (noise, RSSI, more), voltage, and temperature over SNMP and Modbus.

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Xeta9 INS Specifications

Transmitter	ISM FHSS	ISM DTS
Frequency Range	902 to 928 MHz	
Output Power	10 to 1000 mW (10 to 30 dBm)	
Modulation	MSK, 2FSK, BPSK, QSPK, 8PSK, 16PSK, 16QAM, 32QAM, 64QAM	
Data Rate	57 to 5303 kbps	530 to 5303 kbps
Channel Bandwidth	77, 154, 207, 310, 600, 900 & 1200 kHz	600, 900 & 1200 kHz
Frequency Stability	1.0 ppm	
Range	70+ miles	30 miles

Receive sensitivity numbers are with FEC disabled. When enabled, sensitivity improves by 3 dBm.

Receiver	ISM					
	77 kHz Channel		154 kHz Channel		207 kHz Channel	
Modulation	**Sensitivity**	**Data Rate**	**Sensitivity**	**Data Rate**	**Sensitivity**	**Data Rate**
MSK	-110 dBm	57 kbps	-107 dBm	114 kbps	-106 dBm	153 kbps

	310 kHz Channel		600 kHz Channel		1200 kHz Channel	
Modulation	**Sensitivity**	**Data Rate**	**Sensitivity**	**Data Rate**	**Sensitivity**	**Data Rate**
MSK	-105 dBm	229 kbps				
BPSK			-100 dBm	530 kbps	-99 dBm	884 kbps
QPSK			-98 dBm	1061 kbps	-97 dBm	1768 kbps
8PSK			-93 dBm	1591 kbps	-92 dBm	2651 kbps
16PSK					-85 dBm	3535 kbps
16QAM			-89 dBm	2121 kbps	-87 dBm	3535 kbps
32QAM			-86 dBm	2651 kbps	-83 dBm	4419 kbps
64 QAM			-76 dBm	3182 kbps	-76 dBm	5303 kbps

	900 kHz Channel	
Modulation	**Sensitivity**	**Data Rate**
2FSK	-100 dBm	663 kbps

RF Selectivity	50 dB

**** Frequency Range may vary by Country, for example***

Australia, Peru	916-928 MHz
Brazil	902-907 & 916-928 MHz

Xeta9 INS Specifications

Processing

CPU	ARM Cortex-A8 @ 300 MHz
OS	Debian
RAM | Flash	256 MB | 4 GB

Power

Transmit	235 mA @ +12 Vdc
Receive	190 mA @ +12 Vdc
Idle	176 mA @ +12 Vdc

Interfaces

Power	2-pin Phoenix | +10 to +32 Vdc
Ethernet	2x RJ45 | 10/100 Mbps Base-T
Serial	2x RJ45 | up to 1Mbps | RS232/422/485
Micro-USB	On-the-Go | +5 Vdc @ 500 mA
RF	2x TNC | 50 Ohms
Standard I/O	1x MMS input/output | 2 x DI

Environmental/Physical

Op. Temp.	-40°C to +75°C
Humidity	95% @ +40°C non-condensing
Safety	UL Class 1 Div 2
Dimensions	6.62” x 3.45” x 1.83”
Weight	700 grams (metal)

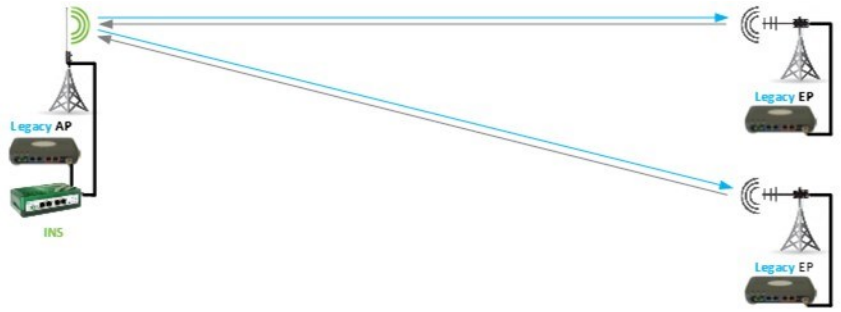
Functionality

Operating Modes	Point to Point, Point to MultiPoint, Enhanced MultiPoint, Mesh
Roles	Access Point
Compatibility	FreeWave DGR, FGR, FGR2, and FGR3 serial radios, FGR2 and HT Plus Ethernet radios, MicroHard Nano IPn920BD and IPn920BD-ENC radios
Networking	Static IP Routing, Net Filtering, Port Forwarding, Network Address Translation, Modbus Bridging
Protocols	IEEE 802.3, TCP, UDP, ARP, DHCP, NTP, FTP, ICMP, HTTP, HTTPS, SSH, Telnet, Multicast SNMP
Management	Web GUI, SNMP v1, v2, & v3
VLANs	802.1q VLANs and Trunks, QoS
Quality of Service	Four Levels of VLAN QoS
Serial Services	TCP/UDP Terminal Server, TCP Terminal Client, Up to 5 Simultaneous Connections
Error Handling	CRC, FEC, Retransmit on error
Error Correction	Golay, Reed-Solomon
Data Encryption	128 & 256-bit AES Payload Data Encryption
RF Encryption	128-bit AES RF Overhead Encryption
Hop Patterns	10 Pseudo Random, 1 Pseudo Random Based on Network ID, 1 Secure
Secure Hop Pattern	128-bit AES Hop Pattern Determination
Compression	Low, High, Decompress Only
Repeater	Store-and-forward
MultiMaster (MMS)	Synchronization of Collocated Access Points or Multiple Access Points within a Network
MultiSpeed	Up to 4 Data Rates within the Same Channel Bandwidth
Diagnostics	Neighbor List, RF Ping, RF Throughput, RF Statistics, IP Ping, Traceroute, IPERF, TCP Dump, DNS Lookup, Network Statistics, Serial Statistics, Modbus Bridging Statistics, Statistics Graphing and CSV downloading

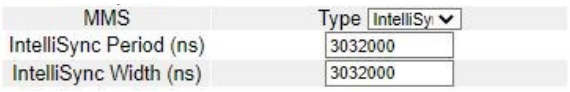
Xeta9 INS Specifications

Simple Migration Process

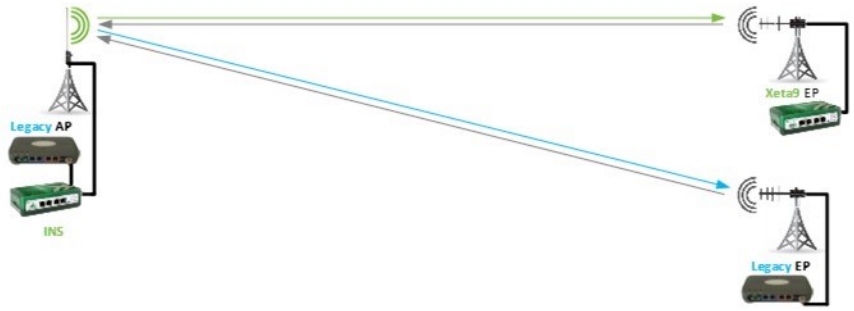
Step 1 — Install INS at legacy Access Point or master location
Connect antenna system to INS antenna port 1 and connect legacy radio to INS antenna port 2.



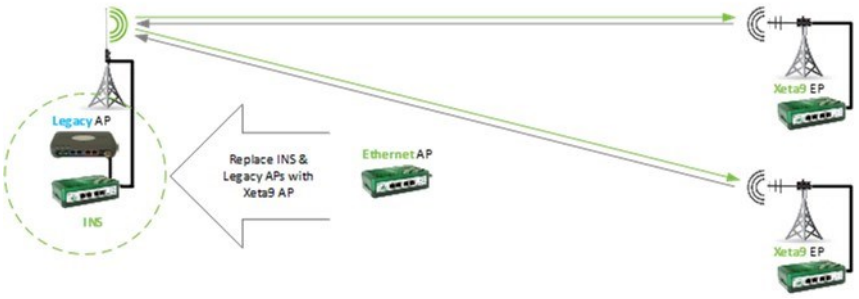
Step 2 — Select correct INS timing parameters
Enter INS period and width parameters by referring to timing tables in INS manual.



Step 3 — Configure and deploy XetaWave endpoint radios
Set IP address, network ID, device ID, link with device ID, and AutoConfigure then replace legacy remotes as time and budget permits.



Step 4 — Complete migration process
100% of legacy remotes replaced, AutoConfigure used to switch off INS timing, standard Xeta9 replaces the INS.



Ordering

XETA9-22IMDFC-INS	Metal Enclosed, 2 Ethernet & 2 Serial, 2DIs, 1 MMS, ISM

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Specifications subject to change without notice. 3.2025

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