

Intelligent Network Synchronizer

The XetaWave Intelligent Network Synchronizer (**XetaINS**) offers a migration path from legacy 900 MHZ ISM technology to next generation, higher performing XetaWave technology. The INS allows for simultaneous operation of a legacy ISM network and a XetaWave ISM network, providing you the ability to replace the 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.

The **XetaINS** synchronizes transmissions with a serial or Ethernet legacy Access Point (Master), 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.



The **XetaINS** at the Access Point site can be installed and the legacy remotes with XetaWave remotes replaced as time and budget permit. Once all legacy remotes have been replaced, the **XetaINS** can be replaced with 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.

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

Configurable INS web UI is consistent with XetaWave radios simplifying configuration.

Network Types Point to Point, Point to MultiPoint, Enhanced MultiPoint (**XetaEMP**), and **XetaMESH**.

XetalNS 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, QPSK, 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

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	-103 dBm	229 kbps				
BPSK			-99 dBm	530 kbps	-98 dBm	884 kbps
QPSK			-95 dBm	1061 kbps	-95 dBm	1768 kbps
8PSK			-91 dBm	1591 kbps	-90 dBm	2651 kbps
16PSK					-83 dBm	3535 kbps
16QAM			-87 dBm	2121 kbps	-86 dBm	3535 kbps
32QAM			-81 dBm	2651 kbps	-81 dBm	4419 kbps
64 QAM			-76 dBm	3182 kbps	-76 dBm	5303 kbps

900 kHz Channel

Modulation	Sensitivity	Data Rate
2FSK	-98 dBm	663 kbps

RF Characteristics

Insertion Loss	< 2 dB
Intermodulation	None
Isolation	40 dB between radios
Return Loss	> 20 dB regardless of antenna VSWR

XetalNS Specifications

Processing

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

Interfaces

Power Connector	2-pin Phoenix / +12 to +32 Vdc
Ethernet	2 x RJ45 / 10/100 Mbps Base-T
Serial	2 x RJ45 / up to 1Mbps / RS232/422/485
Micro USB	On-the-Go; +5 Vdc @ 500 mA
RF Connector	2 x TNC / 50 Ohms

Power

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

Environmental/Physical

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

Functionality

Legacy Radios Supported	FreeWave DGR, FGR, FGR2, and FGR3 serial radios, FGR2 Ethernet radios, and HT Plus Ethernet radios MicroHard Nano IPn920BD and IPn920BD-ENC radios
Operating Modes	Point to MultiPoint, Enhanced MultiPoint, MESH
Roles	Access Point
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, Modbus RTU Server
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
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, Serial Statistics, Modbus Bridging Statistics

Ordering

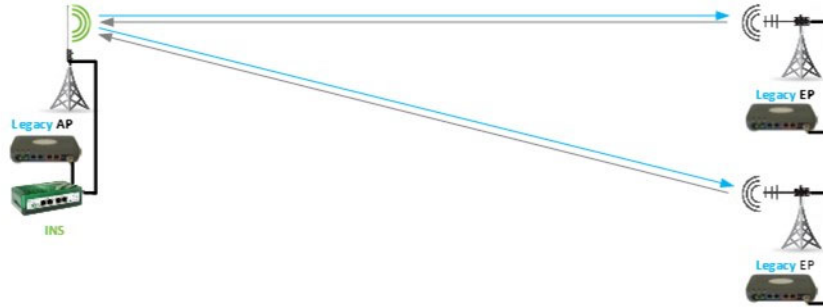
XETA9-22IMDFC-INS	Metal Enclosed radio, 2 Ethernet, 2 serial
-------------------	--

XetaINS Specifications

Simple Migration Process

Step 1 — Install INS at legacy Access Point location

Connect antenna system to INS antenna port 1 and connect legacy radio to INS antenna port 2.



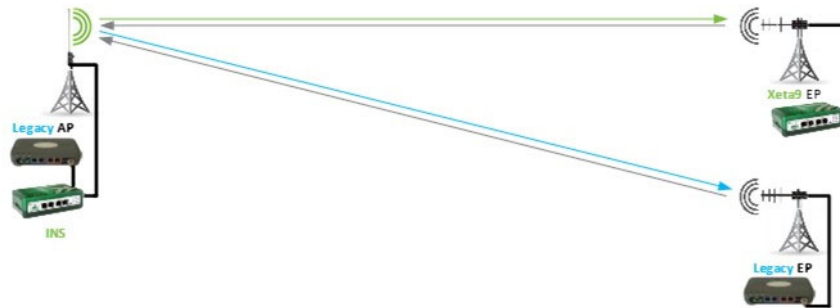
Step 2 — Select correct INS timing parameters

Enter INS period and width parameters by referring to timing tables in INS manual.

MMS	Type
IntelliSync Period (ns)	IntelliSy <input type="text" value="3032000"/>
IntelliSync Width (ns)	<input type="text" value="3032000"/>

Step 3 — Configure and deploy XetaWave endpoint radios

Set IP address, network ID, device ID, link with device ID, and AutoConfigure and 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, Xeta9 configured to replace the INS.

