Grid Solutions

iNET-II

Secure IP/Ethernet

LAN Extension | Ethernet and Serial

The MDS iNET-II is an industrial wireless solution that provides long distance, unlicensed communications, up to 1 Mbps, allowing users to interface both Ethernet and serial controllers such as PLCs, RTUs and SCADA systems. The MDS iNET-II offers the right balance of speed and range to enable a wide variety of applications that require higher data capability than typical SCADA communication systems can provide. It combines the higher speed of Digital Transmission Systems (DTS) with the robustness of Frequency Hopping technology.

The MDS iNET-II combines the interfaces, functionality and security features that are standard across the Information Technology (IT) industry with a hardened radio platform necessary for the harsh environment of mission-critical applications in SCADA applications.

Key Benefits

- Provides wireless megabit-speed connectivity to Ethernet devices
- Unlicensed long range communication of IP/Ethernet and serial data
- Multiple layers of cyber-security, including AES 128-bit encryption, 802.1x device authentication and frequency hopping
- Supports multiple industry-standard protocols including Modbus TCP, DF1 and IEC 61850
- Reduces integration, configuration, and support costs found with multi-box solutions

Application Specific Wireless Solution

Energy

- Remote control of EID at distribution substations
- Condition monitoring for pole-top circuit breakers and capacitor banks

Oil & Gas

- Remote monitoring of pipeline flow and status signals
- Monitor and transmit wellhead pressure and tank levels collected by RTUs

Water & Wastewater

- Monitor lift stations across multiple sites from control room
- Slow scan video surveillance of reservoirs

Heavy Industrial

- Activation of perimeter gates based on detection of vehicle
- Monitor and control remote pumps and compressors

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Industrially Hardened

- Operation in extreme temperatures from -30°C to 60°C
- CSA-approved for class I, Div. 2 groups
- IEEE-1613* approval for operation in electric substation environments

Application Flexibility

- Industry standard software compatibility in industrial grade hardware platform
- Megabit speed accommodates multiple services on one infrastructure
- Long range wireless communication, up to 20 miles
- IP/Ethernet and serial functions can operate simultaneously on the same network

Reliable & Scalable

- Unlicensed spread spectrum technology
- Point-to-Multipoint, 2-way communication
- High receive sensitivity for noisy environments and long distances
- Handles multiple industry protocols including Modbus, Modbus TCP, and DF1

Secure

- 802.1x centralized authentication prevents unauthorized access
- Built-in AES 128-bit encryption
- Dynamic key rotation
- VLAN traffic segregation
- Password protected access and lockdown

** Requires an external DC to DC converter having floating DC inputs (neither side grounded)*

Application Flexibility

The MDS iNET-II family of industrial-strength data communications products offer secure, reliable, long distance transmission of data for your mission-critical applications. The iNET-II operates in the unlicensed 900 MHz spread spectrum frequencies.

The iNET-II solution interfaces directly to a wide variety of controllers and offers a quickly developed, low cost alternative to wires.

Secure Wireless Connectivity

iNET-II is the most secure wireless device available for industrial applications. Standard WiFi equipment operates on a different frequency than iNET-II. This is another layer of protection because common hacking tools do not even detect iNET-II signals. Additionally the iNET-II encrypts wireless data with the AES 128 cipher and automatically rotates the encryption keys.

iNET-II is compatible with industry-standard software such as RADIUS servers used for centralized authentication of users and devices. iNET-II is also VLAN aware and can act as a trunk or access port, allowing for segregation of operational data from management traffic.

Mobile Network Access

iNET-II has the power to operate in mobile applications, allowing vehicles to communicate with control centers. An iNET-II radio can roam between multiple access point locations, while providing near-seamless data handling.

IP/Ethernet and Serial Communications

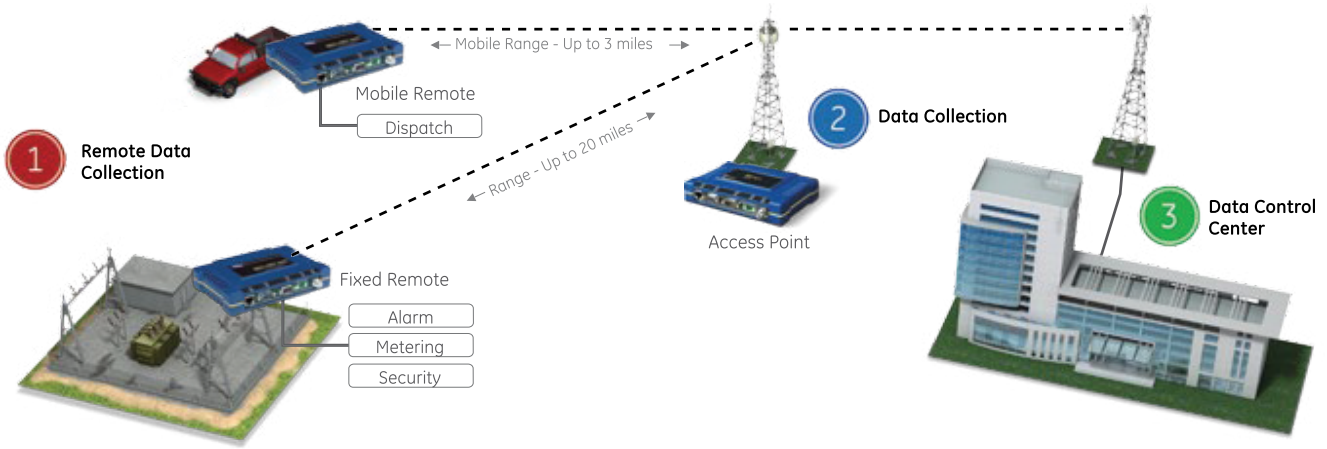
iNET-II is a cost-effective solution to transport IP/Ethernet and serial data from attached PLCs and RTUs over long distances to SCADA systems.

For IP/Ethernet communications, the iNET-II Access Point is necessary to communicate with remote radios.

A Simple Path to Technology Upgrade

In applications where serial RTUs or PLCs already exist, iNET-II remotes can be deployed to replace existing communication devices, wired or wireless, as it will accept connection of both Ethernet and serial controllers. This capability allows a smooth transition from a serial based SCADA infrastructure to IP/Ethernet without disrupting day-to-day operations.

iNET-II Application Advantages



Mobile Applications

- iNET-II can be used to communicate with vehicles over a service area
- Remote radios handoff between multiple access point locations
- iNET-II provides IP/Ethernet and serial data communications

Protocol Communications

- iNET-II supports multiple protocols including Modbus, Modbus TCP, DF1
- Provides IP/Ethernet and serial communication to SCADA hosts and HMIs
- Accommodates multiple protocols for diverse devices on the same IP/Ethernet network

Speed and Range

- One megabit is adequate for most data applications, and in some cases for video transmissions
- The 15-mile fixed typical transmission range of iNET-II covers the most common distances without sacrificing usable speed

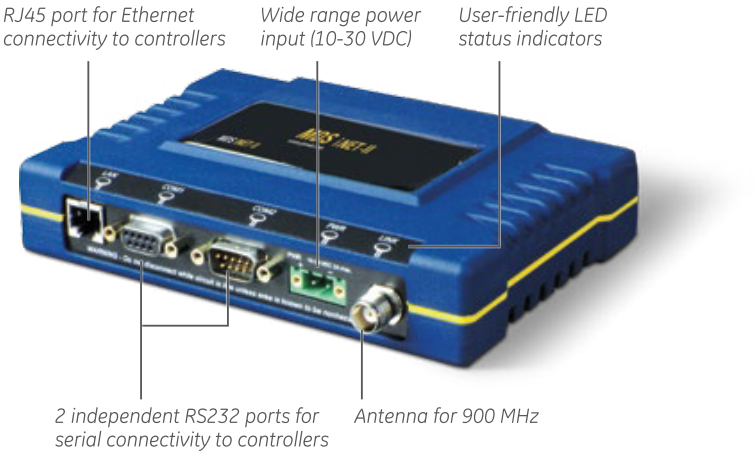
Remote & Access Point

The iNET-II radio operates in the 900 MHz frequency band under the FCC rules for Industrial, Scientific, and Medical (ISM) equipment. Every system must have at least one access point model. You can choose between remote models that support serial only, Ethernet only or both types of interfaces (DG Model).

The iNET-II handles concurrent Ethernet from multiple sources. Directly address the integrated serial device server using industry-standard protocols (e.g., Telnet, TCP, UDP), and serve as backhaul to MDS TransNET, SD, 4710 and 9710 radios.

Every iNET-II radio includes an SNMP agent and can be managed by MDS NETview or any other SNMP-based management system.

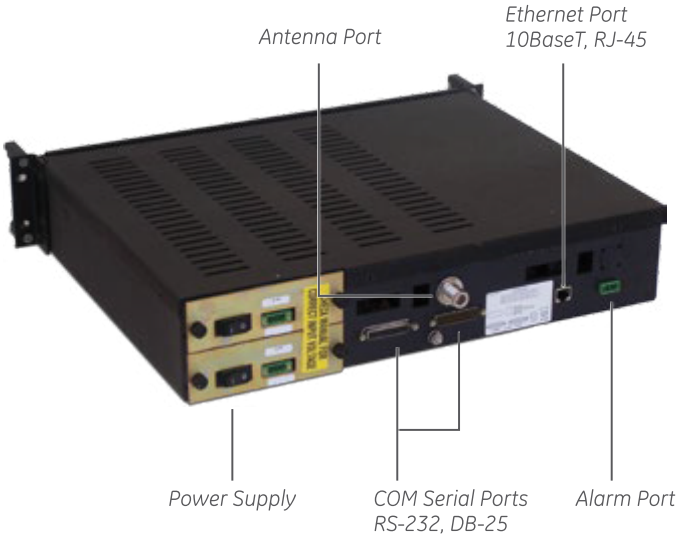
An access point radio can be configured to operate as a remote, serving as a common replacement for any access point or remote locations and simplifying maintenance tasks in the field.



Protected Station

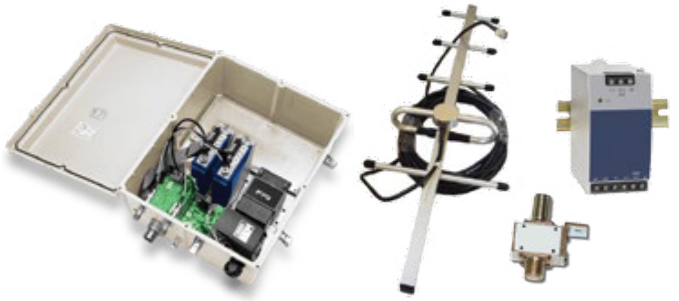
Mission-critical applications demand that no single point of failure can stop the communications system. In wireless applications the access point serves as the central hub to all remote radios. The P21 Protected Station increases the availability of a system by housing two radios in a cold standby configuration. The standby radio activates automatically whenever a fault condition is detected by the active radio.

The MDS P21 Protected Station houses two iNET-II radios inside, and a standard iNET-II unit can be used as a spare during field maintenance. A Protected Station can also operate with Remote iNET-II radios, allowing for deployment of redundant point-to-point link configurations, and providing a cost-effective replacement for analog microwave links.



Accessories & Custom Enclosures

GE Vernova MDS provides a complete line of reliable industrial-strength and cost-effective accessories that are tested to perform at optimal levels and maintain product warranties. GE Vernova MDS offers both standard and custom packages for wireless applications in harsh industrial environments. We simplify your wireless systems design by providing a convenient single-source ordering process. From antennas for the iNET-II (900 MHz) to field-rated power supplies for your mission-critical application, GE Vernova MDS can help ensure your system is robust and future-proof.



Specifications

GENERAL

Data Rate	1 Mbps/512 Kbps user configured air link
Frequency band	902-928 MHz ISM band
Spreading mode	DTS/FHSS
Range (512 Kbps)	Up to 20 miles (fixed) Up to 3 miles (mobile)
Range (1 Mbps)	Up to 15 miles

AVAILABLE CONFIGURATIONS

Remote Serial Gateway
Remote Ethernet Bridge
Access Point/Remote Dual Gateway (Both Serial and Ethernet)

RADIO

System gain	139 dB @ 512 Kbps; 134 dB @ 1 Mbps
Carrier power	100mW to 1W (20 to 30 dBm)
Output impedance	50 Ohms
Occupied bandwidth	600 kHz
Modulation	CPFSK (continuous phase FSK)

RECEIVER SENSITIVITY (WITH 10-6 BER):

512 Kbps	-97 dBm
1 Mbps	-92 dBm

PHYSICAL INTERFACE

Ethernet	10baseT, RJ-45
Serial	
COM1	RS-232/V.24, DB-9F, DCE
COM2	RS-232/V.24, DB-9M, DTE, 1, 200-115, 200 bps serial ports
Antenna	TNC connector (female)
LEDs	Lan, Com1, Com2, Power, Link

PROTOCOLS

Wireless	CSMA/CA (collision avoidance)
Ethernet	IEEE 802.3, ethernet II, IEEE 802.1Q (trunk, access, and native), STP, IGMP
TCP/IP	DHCP, ICMP, UDP, TCP, ARP, Multicast, SNTP, TFTP
Serial	PPP, encapsulation over IP (tunneling) for serial async multidrop protocols including Modbus, DNP.3, DF1, BSAP
Optional	Modbus TCP

MDS CYBER SECURITY SUITE, LEVEL 4

Encryption	AES-128 with automatic key rotation. (optional)
Authentication	802.1x, RADIUS, EAP/TLS, PKI, PAP, CHAP
Traffic segregation	802.1Q VLAN
Management	SSL, SSH, HTTPS

MANAGEMENT

HTTP, HTTPS, SSH, TELNET, local console
SNMPv1/v2/v3, MIB II, enterprise MIB
SYSLOG
MDS NETview MS™

ENVIRONMENTAL

Temperature	-30°C to +60°C (-22°F to +140°F)
Humidity	95% at 40°C (104°F) non-condensing

ELECTRICAL

Input power	10.5-30 Vdc
Current consumption (nominal)	

Mode	Power	13.8 Vdc	24 Vdc
Transmit	7 W	510 mA	290 mA
Receive	2.8 W	200 mA	120 mA

MECHANICAL

Case	die cast aluminum
Dimensions	3.15 H x 17.2 W x 11.2 D cm. (1.25 H x 6.75 W x 4.5 D in.)
Weight	908 g (2 lb.)
Mounting options	flat surface mount brackets, DIN rail, 19" rack tray

P21 OPTION:

Case	steel (rack mountable 2U)
Dimensions	8.9 H x 48.3 W x 35.6 D cm. (3.5 H x 19 W x 14 D in.)
Weight	7.6 kg, (14.7 lbs) with transceivers

AGENCY APPROVALS

FCC part 15.247 (DTS)
UL/CSA class 1 Div. 21
IC
IEEE 1613*

** Requires an external DC to DC converter having floating DC inputs (neither side grounded)*

Ordering

iNET-II Remote and Access Point

iNETII-	**	*	*	
Features	AP			Access Point
	DG			Dual Gateway. Ethernet and Serial remote
	EB			Ethernet Bridge. Ethernet only remote
	SG			Serial Gateway. Serial only remote.
Mounting		S		Standard brackets for mounting on flat surfaces
		N		No brackets
		D		Din-rail brackets
Special Assembly			N	None
			A	Mounted in a P21 Protected Station

Order Code Example
iNETII-**APNN**
- Access point
- Ethernet and Serial
- No mounting brackets
- No special assembly

P21 Protected Station

P21-	**	*	
Input Power	1		12 VDC
	2		24 VDC
	3		48 VDC
	A		115/220 VAC with battery backup
	B		115/220 VAC without battery backup
Antenna Ports		1	One port
		2	Two ports

Order Code Example
P21-**21**
- Protected station for iNET-II
- Radios ordered separately
- 24 VDC power input
- Single antenna port (switched)

For more information, visit
gevernova.com/grid-solutions

GEA-12839(E)
English
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