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

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
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

• 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

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

• 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

Mobile Network Access

Remote Data Collection

1. Remote Data Collection

2. Data Collection

3. Data Control Center

Fixed Remote

Mobile Remote

Mobile Range - Up to 3 miles

Range - Up to 20 miles

Alarm

Metering

Security

Dispatch

www.GEDigitalEnergy.com
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 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 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 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**: 100 mW to 1 W (20 to 30 dBm)
- **Output impedance**: 50 Ohms
- **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**: 10BASE-T, RJ-45
- **Serial**: RS-232/V.24, DB-9F, DCE
- **COM1**: 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, 802.1Q (trunk, access, and native), STP, IGMP
- **TCP/IP**: DHCP, ICMPP, UDP, TCP, ARP, Multicast, SNMP, TFTP
- **Serial**: PPP, encapsulation over IP (tunneling) for serial async multiprotocol including Modbus, DNP3, DF1, BSAP

### 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

### ENVIROMENTAL
- **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)
  - Transmit: 7 W, 510 mA, 24 Vdc
  - 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.
- **Weight**: 908 g (2 lb)

### P21 OPTION
- **Case**: steel (rack mountable 2U)
- **Dimensions**: 8.9 H x 48.3 W x 35.6 D cm.
- **Weight**: 7.6 kg, (14.7 lbs) with transceivers

### AGENCY APPROVALS
- **FCC**: part 15.247 (DTS)
- **UL/CSA**: class 1 Div. 21 IC

### Ordering

#### iNET-II Remote and Access Point

<table>
<thead>
<tr>
<th>Feature</th>
<th>AP</th>
<th>DG</th>
<th>EB</th>
<th>SG</th>
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<tbody>
<tr>
<td>Access Point</td>
<td>A</td>
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<tr>
<td>Ethernet and Serial remote</td>
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<tr>
<td>Ethernet Bridge</td>
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<tr>
<td>Serial only remote</td>
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<tr>
<td>Dual Gateway</td>
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<td>No mounting brackets</td>
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<td>No special assembly</td>
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### P21 Protected Station

<table>
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<th>Access Point</th>
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### Order Code Example

**iNET-II-APNN**
- Access point
- Ethernet and Serial
- No mounting brackets
- No special assembly

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

### Accessories for the iNET-II

- **Fixed Remote Kit with Yagi**: KFR-N09-D1
- **Power Supply (AC Input)**: 01-3682A02

### Visit www.GEMDS.com/iNET-II to:

- Buy iNET-II through the online store
- Download guideform specifications
- Download user documentation
- Read application notes and white papers