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Smarter Vehicles, Safer Roads
MCNU R1551.

The Multiband Configurable Networking Unit (MCNU) R1551 is a wireless communication solution for transportation infrastructure. The MCNU is deployment ready and supports Vehicle Infrastructure Integration (VII) and industry common protocols for vehicle communications operating in the 5.9 GHz Dedicated Short Range Communications (DSRC) band.

Business Challenge: The MCNU addresses Intelligent Transportation Systems (ITS) research of more than fifteen years indicating that America's roadways have a safety and congestion problem. Safety statistics point to six million vehicle crashes per year and more than 42,000 deaths per year. Today, urban surface transportation congestion is estimated at $80 billion per year and direct economic costs of vehicle crashes and fatalities are $230.6 billion per year.

A New Approach: The MCNU offers an unprecedented value proposition to the public and to operators of municipal wireless networks. It supports transportation management, safety and security applications that can achieve dramatic improvements in vehicular safety, reduce the number of deaths and injuries on the road as well as validate potential safety, mobility and commercial applications.

Features.

5.9GHz DSRC standard compliant: The MCNU R1551 communications are compliant with IEEE and SAE 5.9GHz DSRC standards including IEEE 802.11p, 1609 standards and SAE J2735.

MCNU R1551 Product Highlights:

- Compliant with 5.9 GHz DSRC standards including IEEE 802.11p, 1609.2, 1609.3, and 1609.4 and SAEJ2735
- Deployed in all major VII test beds
- Simultaneously enables local, regional wireless communication networks in licensed or unlicensed frequency bands
- Installed on intersection traffic poles, street signs and highways
- Provides in-vehicle wireless communications
- Supports secure and anonymous communications for vehicle safety applications

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Licensed 4.9 GHz, Unlicensed 2.4 GHz and 5. GHz: The MCNU dual radio platform provides simultaneous communications in licensed and unlicensed frequency bands offering wireless broadband access to VII, Public Safety, Public Works and Public Access applications.

Secure Routing: The MCNU has two high-speed Ethernet ports to enable flexible routing between multiple wired and wireless IP subnets in the roadside network infrastructure. Built-in IPv4 and IPv6 firewall and VPN capabilities enable secure routing and tunneling through backhaul networks.

Deployment Ready: The MCNU is easy to deploy and installation ready. The MCNU management software provides a comprehensive SNMP-based network management solution for remote control of network configuration and performance monitoring.

Integrated GPS Positioning: The MCNU provides fast and accurate location information with its built-in WAAS enabled GPS receiver.

VII Application Interface: The MNCU open application interfaces allows a flexible and ease integration to the VII network services and transportation back office systems.

Web Base Configuration: The Web-based graphics interface allows for easy to use configuration of the MCNU platform.

WAVE Communications Test Software Suite: Built-in Communications Test helps to detect installation issues and provides information about wireless coverage, data transfer, and packet error rates.

MCNU R1551 Applications:

The MCNU supports transportation management, safety and security applications including support of Intelligent Transportation System (ITS) Vehicle Infrastructure Integration (VII) Initiative:

- Electronic Toll Collection
- E-Commerce
- Vehicle Safety/Crash Avoidance
- Emergency & Transit Vehicle Signal Preemption
- Traffic and Traveler Information
- Commercial Vehicle & Fleet Management
- Automotive OEM/Telematics

Technical Specification:

Host Computer:
- Processor: Pentium grade (1.5 GHz with Dynamic Freq. Scaling)
- Memory: 512 MB RAM
- Storage: 2 GB Flash
- Operating System: Linux OS (Kernel 2.6.x)

Built-in Modules:
- 16 channel WAAS-enabled GPS receiver
- 1609.2 Security Accelerating module
- Temperature and humidity sensors

Wireless Interfaces

Two (2) wireless radio interfaces:
- IEEE 802.11a/b/g/j/p PHY

Frequency Band:
- 2.400 – 2.484 GHz (ISM)
  5.470 – 5.725 GHz (UNII)
- 4.940 – 4.990 GHz (PS)
  5.725 – 5.825 GHz (UNII)
- 5.150 – 5.250 GHz (UNII)
  5.825 – 5.8250 GHz (ISM)
- 5.250 – 5.350 GHz (UNII)
  5.850 – 5.925 GHz (ITS-DSRC)

Data Rates:
- 1, 2, 5.5, 11 Mbps
- 3, 4.5, 6, 9, 12, 18, 24, 27 Mbps
- 6, 9, 12, 18, 24, 36, 48, 54 Mbps

Supported Networking Standards:
- Support for IEEE P1609.2/3/4, 802.11p
- Support for IPv6 and IPv4
- Security enhancements – IEEE 802.11i
- QoS enhancements – IEEE 802.11e
- Mesh backhauling with 802.11a/b/g and 4.9 GHz

Software Features and Packages (selected):
- Network security: IPsec, VPN, Firewall
- Routing: IPv4 and IPv6
- Remote Management: SNMP-based
- Java: Java2SE 1.5 JVM and JRE
- FTP and Web servers.

Web based Configuration Capability to manage platform settings:
- DSRC parameters
- IP network settings
- Resident application interfaces

Connections and Interfaces:
- 4 – N-type radio antenna connectors (2 radio interfaces per radio to support radio antenna diversity)
- 1 – SMA connector for internal GPS
- 2 – 10/100 Mbps Ethernets
- 1 – Combo connector (barrel-type) combining:
  RS232 Serial (2)
  USB 2.0 (1)

Electrical Power:
- DC power 18 to 36 VDC
- AC power 120V AC (via external supply)
- Power consumption 30W max

Physical and Environmental:

Temperature
- -35° C to +65° C @ 1.0 GHz
- -35° C to +75° C @ 733 MHz
- -35° C to +85° C @ 400 MHz
- Enclosure NEMA4X compliant

Weight:
- 5.44 kg (12 lbs) (including mounting hardware)

Size:
- 280 mm x 253 mm x 111 mm (11 in x 10 in x 4.37 in)

Model Information:
- R1551 MCNU base platform

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