

# MCNU™

## Multiband Configurable Networking Unit

## Smarter Vehicles, Safer Roads

**TechnoCom's** Multiband Configurable Networking Unit (MCNU) is a roadside ready wireless routing and application hosting platform designed to support Vehicle Infrastructure Integration (VII) and Intelligent Transportation Systems (ITS).

The MCNU can serve as a roadside unit (RSU), broadband wireless router or multi-band wireless access point. It can also serve as a mobile station integrated into the vehicle onboard system to allow for wireless vehicle communication.

### 5.9 GHz VII and ITS Communications Ready

The MCNU is the industry leading platform designed to enable communications in the 5.9 GHz ITS DSRC band. The MCNU integrated wireless radios support IEEE 802.11p wireless standards. The MCNU communication software supports new features of the DSRC/WAVE IEEE 1609 standard designed for vehicle security, safety and mobility applications.

### Licensed 4.9 GHz, Unlicensed 2.4 GHz and 5. GHz

The MCNU dual radio multi-band system can be configured locally or remotely to operate in the licensed 4.9 GHz Public Safety or the unlicensed 5 GHz and 2.4 GHz municipal WiFi bands. The MCNU multi-radio, multi-frequency architecture can enhance existing local wireless infrastructure, or support its expansion, and allows for VII, Public Safety, Public Works and Public Access to be given separate and dedicated wireless broadband access.

### Secure Routing

The MCNU has three high-speed Ethernet ports to enable flexible routing between multiple IP subnets in the roadside network infrastructure. Built-in IPv4 and IPv6 firewall and VPN capabilities enable secure routing to the backhaul networks.



### Installation Ready

Installed in the vehicle or attached to roadside infrastructure such as light poles, power poles, freeway signs, traffic signal controllers, or buildings, 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 that allows data to instantaneously pass through the vehicle to the infrastructure. It can assist in the deployment of general ITS, security surveillance, municipal WiFi, as well as, VII safety, mobility and e-commerce applications.

### Service Hosting Platform

The MCNU interoperable platform can enable traditional communication services or host news application services for a variety of ITS and VII applications:

#### Safety-Related Applications

- Collision avoidance
- Road hazard warnings
- Electronic brake lights

#### Traffic Mobility Applications

- Probe data collection
- Navigation assistance
- Traffic signal priority

#### e-Commerce Applications

- Parking and other payment applications
- Toll collection
- Infotainment

<p><b>Host Computer</b></p> <p>Processor: Pentium grade (1.5 GHz with Dynamic Freq. Scaling)</p> <p>Memory: 512 MB RAM</p> <p>Storage: 2 GB Flash</p> <p>Operating System: Linux OS Kern Level 2.6</p> <p><b>Built-in modules</b></p> <p>16 channel WAAS-enabled GPS receiver</p> <p>1609.2 Security Accelerating module (R1500S only)</p> <p>Temperature and humidity sensors</p> <p><b>Wireless Interfaces</b></p> <p>Two (2) wireless radio interfaces: IEEE 802.11a/b/g/j/p PHY</p> <p><i>Frequency Band</i></p> <p>2.400 - 2.484 GHz (ISM) 4.940 - 4.990 GHz (PS) 5.150 - 5.250 GHz (UNII) 5.250 - 5.350 GHz (UNII) 5.470 - 5.725 GHz (UNII) 5.725 - 5.825 GHz (UNII) 5.825 - 5.8250 GHz (ISM) 5.850 - 5.925 GHz (ITS-DSRC)</p> <p><i>Data Rates</i></p> <p>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</p> <p><i>Supported networking standards</i></p> <p>Support for IEEE P1609.2/3/4 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</p>	<p><b>Software features and packages (selected)</b></p> <p>Network security: IPsec, VPN, Firewall</p> <p>Routing: IPv4 and IPv6</p> <p>Remote Management: SNMP-based</p> <p>Java: Java2SE 1.5 JVM and JRE</p> <p>FTP and Web servers</p> <p><b>Add-on software</b></p> <p><i>WAVE Software Development Kit</i></p> <p>WAVE SDK implements the following IEEE standards</p> <p>P1609.3 Network services</p> <p>P1609.2 Security (R1500S only)</p> <p>P1609.4 Multi-channel operation</p> <p>802.11p 5.9GHz based PHY/MAC</p> <p><i>Positioning API</i></p> <p>Positioning software API and driver to interface the built-in GPS receiver</p> <p><i>Sensor API</i></p> <p>Software driver and API to read built-in temperature and humidity sensors inside the unit enclosure.</p>	<p><b>Connections and interfaces</b></p> <p>4 - N-type radio antenna connectors (2 radio interfaces per radio to support radio antenna diversity)</p> <p>1 - SMA connector for internal GPS</p> <p>3 - 10/100 Mbps Ethernets (RJ-45)</p> <p>1 - Combo connector (barrel-type) combining: RS232 Serial (2) USB 2.0 (1)</p> <p>3 - LED status indicators (2 are user programmable)</p> <p><b>Electrical power</b></p> <p>DC power 12 to 40 VDC.</p> <p>AC power 120V AC (via external supply)</p> <p>Power consumption 30W max</p> <p><b>Physical and Environmental</b></p> <p>Temperature -35° C to +65° C @ 1.0 GHz -35° C to +75° C @ 733 MHz -35° C to +85° C @ 400 MHz</p> <p>Enclosure NEMA4X compliant</p> <p>Weight 8.4 lbs. / 3.8 kg (including pole-mount hardware)</p> <p>Size 12" x 6.7" x 4.78"</p> <p><b>MODEL INFORMATION</b></p> <p><b>R1500</b> MCNU base platform</p> <p><b>R1500S</b> MCNU platform with security enhancements</p>
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