Multi-Network Platform, Vehicle Grade, Dual Concurrent Gigabit Wi-Fi

The AirLink® MG90 is a high performance LTE-Advanced Pro vehicle networking platform, purpose built to provide secure, always-on connectivity for mission critical applications in public safety, transit and field services.

With multi-network connectivity, the MG90 offers dual LTE-Advanced Pro radios, Gigabit Wi-Fi WAN and Gigabit Ethernet, with extensions to Land Mobile Radio (LMR) and satellite systems. The MG90 is also FirstNet Ready™ with support for 700MHz Band 14, and support for priority and pre-emption for first responders.

The MG90 dynamically selects the best available network, based on user-customized scoring systems, using its intelligent policy defined link management, and is able to effortlessly switch between WAN connections to provide uninterrupted communications and prevent downtime, performance issues or dead zones. Together with the AirLink® Connection Manager (ACM), the MG90 consolidates the security for all connected technologies in the vehicle area network (VAN), vastly simplifying deployment and enabling the enterprise to retain management control over network access and connected mobile assets.

The MG90 seamlessly integrates with the AirLink® Mobility Manager (AMM)—a powerful, end-to-end network management solution—to enable simplified, remote and real-time insight and control of connected mobile assets and mission critical applications, and supports vehicle tracking, telemetry and asset management applications. Purpose built for the vehicle with its ruggedized form factor, the MG90 delivers best-in-class reliability and ensures continual operation in harsh mobile environments.
High Performance Vehicle Networking Platform

EXTENSIBLE MULTI-NETWORK CONNECTIVITY
Built for first responders and in-field personnel, the AirLink MG90 offers up to 600 Mbps downlink and 150 Mbps uplink speeds over LTE Advanced Pro, 1.3 Gbps over dual radio, dual concurrent 3x3 MIMO 802.11ac Wi-Fi, and 5-port Gigabit Ethernet. The AirLink MG90 can host up to 128 clients at any one time, and concurrently connect multiple mission critical applications in and around the vehicle including laptops, MVRs and tablets, in addition to providing live video streaming, and rapid secure access to remote databases.

The AirLink MG90 supports up to 26 LTE frequency bands, enabling superior coverage on LTE networks worldwide including dedicated regional Public Safety bands such as FirstNet Band 14. The MG90 has five product variants: An LTE-Advanced Pro variant for North America that is FirstNet Ready with support for Band 14, a Global LTE-Advanced Pro variant with support for Band 20 and Band 28; LTE-Advanced variant for North America & EMEA and one for APAC; and one for the US with support for EV-DO fallback. With dual-SIM functionality for automatic failover between SIMs, the MG90 offers superior connectivity and cost optimization when roaming.

PURPOSE BUILT VEHICLE-READY DESIGN
Purpose built for vehicle power environments, the AirLink MG90 does not require any external power conditioning, is optimized to survive extreme transient surges, and maintains continuous power through cold cranking as low as 5V.

The MG90 was developed with industrial grade components to accommodate extreme temperatures, such as a customized die cast aluminum housing to manage thermodynamics. It is sealed to meet IP64 for resistance to dust and water ingress, and has been tested to meet and exceed the MIL-STD-810G specifications for shock, vibration, temperature and humidity.

CONNECTED VEHICLE AWARENESS
Offering built-in vehicle-ready I/O, Bluetooth and Vehicle Telemetry interface (requires external scanner kit), the MG90 enables remote monitoring of auxiliary devices, such as light bars, sirens and gun racks, and can collect OBD-II or J1939 vehicle telemetry data for engine diagnostic and performance data to monitor vehicle health.

Utilizing next generation GNSS location technology that supports 48 satellites from 4 different satellite constellations, the MG90 provides fast, reliable and precise vehicle location information, even in the most challenging environments. The MG90 contains an Inertial Navigation System\(^1\) that allows it to track without satellites, using dead reckoning algorithms integrated with the GNSS. The Inertial Navigation System continues to provide positioning information when the GNSS is unable to acquire satellites, enabling tracking through urban canyons, tunnels and underground parking.

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\(^1\) Activated in an upcoming software release
**Network Agility**

**POLICY-DEFINED LINK MANAGEMENT**

With its built-in policy engine, the MG90 dynamically selects the best available network, based on a customized user-defined scoring system, including variables such as time, location and vehicle speed. Utilizing traffic segmentation and quality of service (QoS) rules, the MG90 reserves bandwidth for mission critical applications, to ensure they maintain priority.

Providing seamless network handover and millisecond network switching with its cognitive wireless system, the MG90 is able to automatically sense, assess and select the best available WAN connection to provide “always-on,” uninterrupted connectivity in any circumstance, preventing downtime, performance issues or dead zones.

**MOBILE MULTI-NETWORK SECURITY**

Together with the AirLink® Connection Manager (ACM)—an advanced mobile-optimized VPN server—the MG90 provides secure data connections and retains a static IP address across multiple WAN networks, without interruption or rebuilding VPN tunnels, and consolidates the security for all connected technologies in the vehicle area network (VAN) into a single, centralized platform. This vastly simplifies deployment and enables the enterprise to retain management control over network access and connected mobile assets.

The ACM meets industry standard security and uses standards-based protocols.

For more information on the AirLink® Connection Manager (ACM), visit sierrawireless.com/ACM.

**Advanced Network Management**

**NETWORK INSIGHT & CONTROL**

Coupled with the AirLink® Mobility Manager (AMM), the MG90 supports a leading-edge, end-to-end network management solution to enable simplified, remote and real-time mass configuration, control and troubleshooting of all routers, connected mobile assets and mission critical applications.

Available in the enterprise datacenter or in the cloud, the AMM seamlessly integrates with the MG90, displaying a dashboard with an up-to-date view of the entire fleet, and delivers a continuous stream of rich, real-time network data, allowing users to observe, track and examine the behaviour of hundreds of devices, networks, and connected vehicle parameters as it occurs. The AMM enables users to create custom alerts and event triggers, and offers on-demand or pre-scheduled historical reports for in-depth analysis and diagnostics including: Network Performance; Link Scoring; Coverage Maps; Trails; Vehicle Heath; Link Utilization; Availability Reports; Router Power Status.

**OPERATIONS MANAGEMENT**

The AMM provides fleet operations personnel with real-time visibility into vehicle location, network coverage and tracking of mobile assets.

For more information on the AirLink® Management System (AMM), visit sierrawireless.com/AMM.
<table>
<thead>
<tr>
<th>FEATURE</th>
<th>BENEFIT</th>
</tr>
</thead>
</table>
| Extensible, multi-network connectivity with support for single or dual LTE-Advanced Pro radios, dual radio dual concurrent 3x3 MIMO 802.11ac Wi-Fi, and 5-port Gigabit Ethernet, and a multi-band FirstNet upgrade option | **Flexible**: modular radio design allows users to upgrade, add or switch to their choice of supported WAN and service provider  
**Reduces costs**: minimizes operating and capital costs for infrastructure and communications costs by consolidating traffic over single/preferred network connections  
**Scalable**: simplifies management and maintenance of field IT equipment |
| Single or Dual LTE-Advanced (Carrier Aggregation) Wide Area Network (WAN) supporting up to 600 Mbps downlink and 150 Mbps uplink speeds | High speed, concurrent connectivity for multiple wired and wireless devices and applications in and around the vehicle. Provides over 3x better uplink performance vs other LTE routers |
| FirstNet Ready including support for Band 14 (United States). Also supports and Band 20 and 28 (Europe) | Secure, dedicated connectivity for first responders and other public safety fleets |
| State-of-the-art LTE coverage spanning 26 LTE frequency bands worldwide, with automatic 3G fallback (HSPA, EV-D0) | Connectivity to LTE networks worldwide |
| Dual concurrent Gigabit Wi-Fi supports up to 1.3 Gbps, up to 128 clients, WPA2 Enterprise | High speed, concurrent connectivity for all devices and applications in the VAN, and data offload over enterprise Wi-Fi networks |
| Dual-SIM functionality to enable automatic failover between SIMs | Superior network connectivity and cost optimization when roaming |
| Serial and USB connectivity | Compatible with legacy and wired applications |
| One product variant for all major North American and European network operators, and one product variant for all major Asia Pacific network operators | Simplified inventory management by reducing requirements to carry multiple product variants in inventory |
| Automatic radio configuration based on the SIM | Increases flexibility and simplifies inventory management |
| Support for vehicle telemetry to collect OBD-II vehicle telemetry data and monitor engine diagnostics | Access to critical vehicle health data |
| Built-in vehicle ready I/O and Bluetooth for remote monitoring of auxiliary devices, such as light bars, sirens and gun racks | Advanced awareness of fleet operations |
| Precision Geo-location with GNSS, supporting 48 satellites from 4 different satellite constellations (GPS, GLONASS, Galileo, Beidou), streaming data locally over the serial port and remotely over NMEA and TAIP protocols | Superior vehicle location accuracy available to in-field personnel and dispatch staff, and via 3rd party platforms |
| Sealed to meet IP64 for resistance to dust and water ingress, and exceeds the MIL-STD-810G specification for shock, vibration, temperature and humidity, with built-in surge protection and an aluminum chassis for heat dissipation | Superior reliability and uninterrupted operation in harsh vehicle environments |
| Leading class power supply that exceeds E-Mark, ISO 7637-2 and SAEJ1455 requirements, surviving 5V brownouts and spikes from -600 VDC to 200 VDC | Designed to perform with unpredictable and “noisy” power sources |
| Configurable, millisecond network switching and seamless handover across multiple network with policy defined link management | Guarantees always-on, assured connectivity to minimize downtime, increase productivity and reduce costs |
| Patented cognitive wireless system to sense, assess and select the best available network | Simplified deployment: eliminates the need for VPN software clients for individual devices and applications  
Secure: securely connects multiple high bandwidth in-field applications and mobile assets in and around the vehicle  
Control: enables the enterprise to retain management control over network access and connected mobile assets |
| Retains a static IP address across multiple WAN networks, without interruption or rebuilding VPN tunnels, consolidating the security for all connected technologies in the vehicle area network (VAN) into a single, centralized platform using the AirLink® Connection Manager (ACM) | Increases efficiency, reduces costs and supports effective maintenance and long term network performance |
| End-to-end network management with remote mass-configuration, and real-time monitoring, control, and troubleshooting of all routers, connected mobile assets and mission critical applications using the AirLink® Mobility Manager (AMM)—available in the cloud or in the enterprise data center | Advanced precision reporting for detailed analysis and diagnostics including; Network Performance; Link Scoring; Coverage Maps; Trails; Vehicle Heath; Link Utilization; Availability Reports; Router Power Status  
Real-time vehicle location and mobile asset tracking  
Market leader with over 20 years experience in cellular technology  
Comprehensive customer support | Industry leading warranty includes, software updates and advance replacement (through participating channel partners |
### Specification

#### LAN (ETHERNET/USB/WIFI/BLUETOOTH/SERIAL)
- DHCP Server
- VLAN
- Virtual BSSIDs
- PPPoE
- AP Isolation

#### SATELLITE NAVIGATION (GNSS)
- Dedicated 48 channel GNSS Receiver supporting GPS, GLONASS, Beidou, Galileo
- Tracking Sensitivity: -162 dBm
- Reports (Update Rate 1Hz): NMEA, TAIP
- Reliable Store and Forward via serial, TCP or UDP
- Inertial Navigation Sensors1 (Accelerometer and Gyro)

#### NETWORK MANAGEMENT
- AirLink Mobility Manager (AMM): available as cloud based service or as licensed enterprise application
  - Status dashboard showing at-a-glance fleet health
  - Remote management, configuration and software updates
  - Location-based analytics and diagnostics: Network Coverage Maps and Trails; Link Utilization; Bandwidth Consumption
  - Configurable geo-zone based event monitoring and alerting
  - Live vehicle location tracking
  - Optional fleet operations pack: vehicle diagnostics reporting and mobile asset tracking

#### VEHICLE TELEMETRY
- OBD II/1939/170B interface over serial (optional)
- Diagnostic real time alerts/reports (via AMM)

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### MG90

#### United States

<table>
<thead>
<tr>
<th>LTE CATEGORY</th>
<th>North America &amp; EMEA</th>
<th>Asia Pacific</th>
<th>North America</th>
<th>Global</th>
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<tbody>
<tr>
<td>LTE</td>
<td>LTE-A</td>
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<td>LTE-A Pro</td>
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<tr>
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<td>600</td>
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<tr>
<td>Peak U/L (Mbps)</td>
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<td>50</td>
<td>150</td>
<td></td>
</tr>
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</table>

#### 4G LTE Frequency Bands
- 1900(B2), AWS(B4), 850(B5), 700(B13), 700(B17), 1900(B25)
- 2100(B1), 1900(B2), 1800(B3)
- 850(B5), 2600(B7), 900(B8), 850(B19), 1500(B21), 700(B28), TDD 38, TDD 39, TDD 40, TDD 41
- 2100(B1), 1900(B2), 1800(B3), 850(B5), 2600(B7), 900(B8), 850(B19), 700(B12), 700(B13), 700(B14), 850(B18), 850(B21), 850(B20), 850(B26), 700(B29), 2300(B30), 1500(B32), TDD B41, TDD B42*, TDD B43*, TDD B44*, CBRS Band A, 1700(B66)

<table>
<thead>
<tr>
<th>Public Safety LTE Bands</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
<th>FirstNet Band 14 (United States), Band 26, 28</th>
</tr>
</thead>
</table>

#### 2G/3G WCDMA/HSPA+/EVDO Frequency Bands
- 2100(B1), 1900(B2), AWS(B4), 850(B5), 900(B8)
- EVDO: BCO, BC1, BC10
- EDGE/GSM/GPRS: Quad-band

#### APPROVALS
- Regulatory: FCC, PTCRB
- Carrier: Verizon, AT&T, Sprint, Telus, Bell, SouthernLINC, Telstra, AT&T, Verizon (Pending)

#### PART NUMBERS
- 1103541 (Single)
- 1102695 (Single)
- 1102716 (Dual)
- 1103239 (Single)
- 1103240 (Dual)
- 1103981 (Single)
- 1103982 (Dual)
- 1103980 (Single)
- 1103983 (Dual)

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1. Activated in an upcoming software release

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**Sierra Wireless**

**AirLink® MG90 High Performance Multi-Network Vehicle Router**

**HL SERIES EMBEDDED MODULES**

**AirLink® MG90 High Performance Multi-Network Vehicle Router**

**HOST INTERFACES**
- 5 Gigabit RJ-45 Ethernet ports
- 2 USB 3.0 type-A ports
- 1 RS–232 serial port (DB-9 connector)
- 1 Auxiliary RJ-45 Input/Output port
- 5 SIM slots (Dual SIM per radio)
- 5 SMA antenna connectors (2 cellular, 2 diversity, 1 GNSS)
- 7 RP-SMA antenna connectors (3x3 Wi-Fi WAN, 3x3 Wi-Fi AP, 1 Bluetooth)

**SECURITY**
- AAA: 802.1x/RADIUS authentication with Wi-Fi and Ethernet Firewall: Port forwarding and filtering
- WLAN Encryption: WPA2 Personal/Enterprise
- WLAN MAC Address filtering
- FIPS 140-2

**WI-FI**
- Dual Radio, dual concurrent 3x3 MIMO 802.11 b/g/n/ac
- Dual Band 2.4/5 GHz (each radio)
- Support for 128 clients
- WPAP2 Enterprise
- Default mode: Wi-Fi-As WAN and Wi-Fi built-in vehicle AP
- High output power 21 dBm (per channel)
- Captive Portal

**INPUT/OUTPUT**
- Configurable I/O GPIOs (5 pins total – 4 DB9 & 1 Power connector)
- Digital input: 0–36 VDC with optional pullup (Dry contact sense input)
- Digital Open Collector Output > sinking 500 mA

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**LAN (ETHERNET/USB/WIFI/BLUETOOTH/SERIAL)**
- DHCP Server
- VLAN
- Virtual BSSIDs
- PPPoE
- AP Isolation

**SATELLITE NAVIGATION (GNSS)**
- Dedicated 48 channel GNSS Receiver supporting GPS, GLONASS, Beidou, Galileo
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  - Optional fleet operations pack: vehicle diagnostics reporting and mobile asset tracking

**VEHICLE TELEMETRY**
- OBD II/1939/170B interface over serial (optional)
- Diagnostic real time alerts/reports (via AMM)
## Specification

### ENVIRONMENTAL

- Operating Temperature: -30°C to +70°C / -22°F to +158°F
- Storage Temperature: -40°C to +85°C / -40°F to +185°F
- Humidity: 95% RH @ 60°C
- IP64 rated ingress protection
- MIL-STD-810G conformance to shock, vibration, thermal shock, and humidity

### POWER

- Input/Operating Voltage: 7 to 36 VDC
- Power modes: ON 30W (2.5A @12V); Standby 135mW (11mA@12V)
- Built-in protection against voltage transients including 5 VDC engine cranking
- Ignition Sense with time delay shutdown

### NETWORK AND ROUTING

- Network Address Translation (NAT)
- LAN Segmentation
- WAN/LAN Connection Policy Management
- QoS: Application/ Traffic Priority Queuing
- Load Balancing Over Multiple WAN Links
- WAN Monitors: Connection Failure Recovery
- Configurable MTU size
- Multiple LAN Support
- Customize transmission buffer size
- Static Routing
- WAN Ethernet

### VPN

- Integrated with ACM VPN Server
- IPsec protocol with IKEv1/IKEv2
- Encryption: 3DES/AES128/AES256
- Hashing: MD5/SHA1/SHA256/SHA512
- Key Exchange: DHGroup2/5/14/15/16/17
- Support LAN to LAN and Host to LAN
- Up to 10 concurrent tunnels per link
- MOBIKE protocol
- IP compression
- Full/Full Tunnel
- Dead Peer Detection (DPD)

### DIMENSIONS

- 272mm x 220mm x 60mm (10.71in x 8.66in x 2.36in)
- Weight: 2.4kg / 5.3 lb

### INDUSTRY CERTIFICATIONS

- Safety: IECEE Certification Bodies Scheme (CB Scheme), UL 60950
- Environmental: RoHS2, REACH, WEEE
- Rail Usage: EN50155 (Rolling Stock)

### RELIABILITY

- MTBF: 23.22 years (Telcordia SR-332 Issue3 Method1)

### SUPPORT AND WARRANTY

- 3-year standard warranty; Optional 2-year warranty Extension
- Unrestricted device software upgrades

### ACCESSORIES

- In the box: DC Power cable, Quick Start Guide and SMA wrench
- Mounting bracket (6001024)
- AC Adapter (6001095)
- 6-in-1 Dome Antenna (6001121)
- 3-in-1 Wi-Fi Antenna (6001143)
- See website for more antenna options

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**About Sierra Wireless**

Sierra Wireless (NASDAQ: SWIR) (TSX: SW) is an IoT pioneer, empowering businesses and industries to transform and thrive in the connected economy. Customers start with Sierra because we offer a device-to-cloud solution, comprised of embedded and networking solutions seamlessly integrated with our IoT services. OEMs and enterprises worldwide rely on our expertise in delivering fully integrated solutions to reduce complexity, turn data into intelligence and get their connected products and services to market faster. Sierra Wireless has more than 1,400 employees globally and operates R&D centers in North America, Europe and Asia.

For more information, visit [www.sierrawireless.com](http://www.sierrawireless.com).

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