### SMART-MR15™

**L1/L2 GPS+GLONASS Receiver and Antenna with Integrated Cellular Connectivity Ideal for Harsh Industrial Environments**

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<th>Benefits</th>
<th>Features</th>
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<td>Scalable dual-constellation, dual-frequency performance</td>
<td>GPS and GLONASS satellite capability</td>
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<tr>
<td>Smooth, consistent positions for pass-to-pass accuracy</td>
<td>GL1DE® and Advance® RTK centimetre level positioning</td>
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<tr>
<td>Rugged design for on-machine applications</td>
<td>Robust power handling for 12 V to 24 V vehicle power</td>
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<td>Base station free operation</td>
<td>Integrated CDMA or GPRS/HSDPA cellular communications</td>
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### Integrated GNSS Design

NovAtel’s ergonomically designed SMART-MR15 provides an integrated L1/L2 GPS+GLONASS receiver and antenna in a single compact enclosure. Designed to meet or exceed stringent MIL-STD-810G specifications, the SMART-MR15’s rugged metal housing ensures high performance even in the most challenging work environments.

### Precision Performance

The SMART-MR15 features 14 channels for each of L1 and L2 GPS, and 12 channels for each of L1 and L2 GLONASS code and phase tracking. An additional two channels are dedicated for Satellite-Based Augmentation System (SBAS: WAAS, EGNOS and MSAS) signals as well as one channel for L-band.

### Multiple Interfaces Deliver Maximum Flexibility

Two NMEA 0183 compatible RS-232 serial ports, one NMEA2000 compatible CAN ports, and built-in Bluetooth® ensure the SMART-MR15 delivers maximum flexibility. A simulated radar ground speed output, a one pulse per second output (1 PPS), and an event mark input are also provided. Three daylight readable status LEDs simplify infield diagnoses.

### Smooth, Pass-to-Pass Accuracy with GL1DE Technology

NovAtel’s exclusive GL1DE technology is integrated into every SMART-MR antenna. GL1DE uses the very accurate carrier phase calculations to provide ultra smooth positions and excellent pass-to-pass accuracy for agricultural applications. GL1DE functions autonomously and with most available corrections services. It will also bridge through short periods of poor satellite availability. GL1DE’s steady, smooth output is especially well suited for manual guidance and autosteer installations.

### Internal Cellular Modem

The SMART-MR15 comes equipped with an embedded GPRS/HSDPA or CDMA radio to allow NTRIP data to be received over a cellular network. The GPRS/HSDPA radio is PTCRB and GCF certified (pending) and the CDMA Verizon Wireless is carrier approved (pending) to ensure optimal operation. An external cellular connector with optional high efficiency antenna provides robust connections even in poor coverage areas.
### SMART-MR15

#### Performance

- **Channel Configuration**
  - 14 GPS L1, 14 GPS L2
  - 12 GLONASS L1, 12 GLONASS L2 (optional)
  - 2 SBAS
  - 1 L-band

- **Horizontal Position Accuracy (RMS)**
  - Autonomous (L1) 1.5 m
  - Autonomous (L1/L2) 1.2 m
  - SBAS 0.6 m
  - CDGPS 0.6 m
  - DGPS 0.4 m

- **Measurement Precision**
  - Autonomous (L1) 1.5 m
  - Autonomous (L1/L2) 1.2 m
  - SBAS 0.6 m
  - CDGPS 0.6 m
  - DGPS 0.4 m

- **Measurement Rate**
  - 20 Hz

- **Time to First Fix**
  - Cold start 65 s
  - Hot start 35 s

- **Signal Reacquisition**
  - L1 0.5 s (typical)
  - L2 1.0 s (typical)

- **Time Accuracy**
  - 20 ns RMS

- **Velocity Accuracy**
  - 0.03 m/s RMS

### Physical and Electrical

- **Dimensions**
  - 233 mm x 233 mm x 90 mm height

- **Weight**
  - 2.1 kg

- **Power**
  - Input voltage +9 to +36 VDC
  - Power consumption 4.5 W (typical)

- **Connector**
  - 23-pin Tyco ampseal

- **Mounting**
  - 1/4 NC and M6 mounting holes

- **Environmental**
  - Temperature Operating (12V) -40°C to +65°C
  - Storage -40°C to +85°C

- **Humidity**
  - 95% non-condensing

- **Random Vibration**
  - MIL-STD-202G

<table>
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<tr>
<th>Sinusoidal Vibration</th>
<th>ASAE EP455</th>
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<tr>
<td>Shock</td>
<td>MIL-STD-810G, 516.6</td>
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<td>Immersion</td>
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<td>Blowing Rain</td>
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<td>Water Jets</td>
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<td>Object Ingress and Immersion</td>
<td>IEC 60529 IP67</td>
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</table>

- **Ingress Protection Rating**
  - IP67

### Compliance

- **Emissions**
  - FCC, Industry Canada, CE

- **Vehicular Standards**
  - ISO 7637: Compliance ensures product’s ability to withstand vehicular electrical system surges (including inductive load switching transients and load dump)
  - ISO 15003: Compliance ensures product’s ability to withstand vehicular electrical system abnormal conditions (I/O short circuits to battery or ground and abnormal power voltage)

- **Radios**
  - Bluetooth® BT SIG
  - CDMA Verizon certified (pending)
  - GSM/GPRS/HSDPA PTCRB and GCF certified (pending)

- **Cellular Connectivity**
  - CDMA Option
    - Dual-band 800/1900 MHz
    - 1xRTT data up to 153.6 kbps
    - External antenna connector
  - GSM/GPRS/HSDPA Option
    - Tri-band UMTS/HSDPA 850/900/1800/1900 MHz
    - Quad-band EGSM 850/900/1800/1900 MHz
    - HSDPA 7.2 Mbps
    - GPRS multi-slot Class 12
    - EDGE multi-slot Class 12
    - External antenna connector
    - External SIM access

### Optional Accessories

- Mounting plate
- Quick release bracket
- Interface cable
- Cellular antenna
- Cellular antenna mount
- Cellular antenna ground plane (for non-metallic roof mounts)

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1. Typical values. Performance specifications subject to GPS system characteristics, US DOD operational degradation, ionospheric and tropospheric conditions, satellite geometry, baseline length, multipath effects and the presence of intentional or unintentional interference sources.
2. Satellite Based Augmentation Systems (SBAS) include WAAS (North America), EGNOS (Europe) and MSAS (Japan).
3. Expected accuracy after convergence. RT-20 and RT-2 are independent of GL1DE.
4. Typical value. Almanac and recent ephemerides saved and approximate time entered.
5. Relative time accuracy does not include biases due to RF or antenna delay.
6. Export licensing restricts operation to a maximum velocity of 515 m/s.