# SMART-AG™

Self-Contained L1 GPS+GLONASS Receiver and Antenna Ideal for Harsh Agriculture Environments

## Benefits
- Sub-metre real-time accuracy
- Two SBAS channels and GLONASS increase position availability
- Smooth, consistent positions for pass-to-pass applications

## Features
- GL1DE® and AdVance® RTK positioning
- Simulated radar ground speed output
- Integrated Bluetooth® Communication (opt)
- Integrated tilt compensation (opt)
- Three daylight readable status LEDs
- Compatible with 12V or 24V vehicle power

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If you require more information about SMART, visit novatel.com/products/gnss-receivers/smart-antennas

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## SMART-AG™

### Integrated GNSS Design
NovAtel’s SMART-AG provides an integrated L1 GPS+GLONASS receiver and antenna in a single rugged housing. Designed to meet or exceed stringent MIL-STD-810F specifications, the SMART-AG delivers built-in magnets to simplify mounting. Fixed mounting is also supported.

### Precision Performance
The SMART-AG features 14 channels for L1 GPS and 12 channels for L1 GLONASS code and phase tracking. An additional two channels are dedicated for Satellite-Based Augmentation System (SBAS: WAAS, EGNOS and MSAS) signals. Measurement and position data are provided at up to 20 Hz.

### Tilt Compensation for Increased Accuracy
NovAtel’s SMART-AG is available with optional, integrated tilt compensation. This unique feature allows the user to receive a position message, compensated for the tilt of the machine. Fully adjustable, the tilt compensation provides more accurate positioning in uneven topography. The result is more accurate guidance and auto steer performance.

### Integrated Bluetooth Connectivity
The SMART-AG is available with optional, integrated Bluetooth connectivity. All messages from the receiver can be delivered via Bluetooth, allowing for wireless connectivity and innovative applications.

### Smooth, Pass-to-Pass Accuracy with GL1DE Technology
NovAtel’s exclusive GL1DE technology is integrated into every SMART-AG 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 with most available corrections as well as in autonomous situations, and will bridge through short periods of poor satellite availability. Its steady, smooth output is especially well suited for manual guidance and autosteer installations.

### Multiple Interfaces Deliver Maximum Flexibility
Two NMEA 0183 compatible RS-232 serial ports, an NMEA2000 compatible CAN port and built-in Bluetooth ensure the SMART-AG delivers maximum flexibility. A simulated radar ground speed output, a one pulse per second output (1PPS) and an event mark input are also provided. Three daylight readable status LEDs simplify diagnoses in the event of field problems.
### Performance

**Channel Configuration**
- 14 GPS L1
- 12 GLONASS L1 (optional)
- 2 SBAS

**Horizontal Position Accuracy (RMS)**
- Autonomous: 1.2 m, 25 cm
- SBAS: 0.8 m, 18 cm
- DGPS: 0.4 m, 23 cm
- RT-20® (optional): 0.2 m, 2 cm

**Measurement Precision**
- L1 C/A Code: 18 cm RMS
- L1 Carrier Phase: 1.5 mm RMS

**Maximum Data Rate**
- Measurements: 20 Hz
- Position: 20 Hz

**Time to First Fix**
- Cold Start: 65 s
- Hot Start: 35 s

**Signal Reacquisition**
- L1: 0.5 s (typical)

**Time Accuracy**
- 20 ns RMS

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

### Physical and Electrical

**Dimensions**
- 155 mm diameter x 68 mm height

**Weight**
- 500 g

**Power**
- Input Voltage: +8 to +36 VDC
- Power Consumption: 2.5 W (typical)

**Connector**
- 14-pin Tyco Ampseal

**Mounting**
- Built in magnets
- 4 x 8-32 inserts

### Communication Ports

- 2 RS-232 serial ports (460 800 BPS max)
- 1 CAN Bus NMEA 2000
- 1 Bluetooth module (optional)
- 1 PPS
- Ground speed output
- Event mark input

### Environmental

**Temperature**
- Operating: -40°C to +75°C
- Storage: -55°C to +90°C

**UV Protection**
- MIL-STD-810F, 505.4

**Salt Fog**
- MIL-STD-810F, 509.4

**Sand and Dust**
- MIL-STD-810F, 510.4

**Immersion**
- MIL-STD-810F, 512.4

**Vibration**
- MIL-STD-810F, 514.5

**Shock**
- MIL-STD-810F, 516.5

**Compliance**
- FCC, CE, Industry Canada

**Emissions**
- CE, ISO 7637, ISO 15003

### 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 (IO short circuits to battery or ground and abnormal power voltage)

### Optional Accessories

- Mounting plate
- Interface cable

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1. Satellite Based Augmentation Systems (SBAS) include WAAS (North America), EGNOS (Europe) and MSAS (Japan).
2. Typical values with GL1DE enabled. 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. Export licensing restricts operation to a maximum velocity of 515 metres per second.
3. “Pass to pass” or time relative position error is the one dimensional horizontal (cross track) position error after 15 minutes or less after an initial convergence of at least 10 minutes.
4. Typical value. No almanac or ephemerides and no approximate position or time.
5. Typical value. Almanac and recent ephemerides saved and approximate time entered.
6. Relative time accuracy does not include biases due to RF or antenna delay.