SMART

SMART-MR15™

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

Benefits

Scalable dual-constellation, dual-frequency performance

Smooth, consistent positions for pass-to-pass accuracy

Rugged design for on-machine applications

Base station free operation

Features

GPS and GLONASS satellite capability

GL1DE® and AdVance® RTK centimetre level positioning

Robust power handling for 12 V to 24 V vehicle power

Integrated CDMA or GPRS/HSDPA cellular communications

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

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.

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SMART

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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)[1]

Autonomous (L1)	1.5 m
Autonomous (L1/L2)	1.2 m
SBAS [2]	0.6 m
CDGPS	0.6 m
DGPS	0.4 m
OmniSTAR®	
VBS	0.6m
XP	0.15m
HP	0.1m
RT-20®[3] (optional)	0.2 m
RT-2™[3] (optional)	1 cm+1ppm

Measurement Precision

	GPS	GLONASS
L1 C/A code	4 cm	15 cm
L1 carrier phase	0.5 mm	1.5 mm
L2 P(Y) code	8 cm	8 cm
L2 carrier phase	1.0 mm	1.5 mm

Maximum Data Rate

Measurements	20 Hz
Position	20 Hz

Time to First Fix

Cold start[4]	65 s
Hot start[5]	35 s

Signal Reacquisition

L1	0.5 s (typical)
L2	1.0 s (typical)

Time Accuracy[6] 20 ns RMS

Velocity Accuracy[7] 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

Interfaces
- 2 RS-232 serial ports (1 port configurable to RS422) (230, 400 BPS max)
- 1 CAN bus NMEA 2000
- 1 Bluetooth
- 1 PPS
- Ground speed output
- Event mark input

Environmental

Temperature	
Operating (12V)	-40°C to +65°C
Storage	-40°C to +85°C
Humidity	95% non-condensing
Random Vibration	MIL-STD-202G
Sinusoidal Vibration	ASAE EP455
Shock	MIL-STD-810G, 516.6
Immersion	MIL-STD-810G, 512.5
Blowing Rain	MIL-STD-810G, 506.5
Water Jets	IEC 60529 IPX6
Object Ingress and Immersion	IEC 60529 IP67
Aggravated Cycle	MIL-STD-810G, 507.5
Ingress Protection Rating	IP67

Compliance

Emissions
FCC, Industry Canada, CE

Immunity and Safety
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 850/1900/2100 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)

Version 2 -Specifications subject to change without notice.

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For the most recent details of this product:
www.novatel.com assets/Documents/Papers/SMART_MR15.pdf

[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. 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.
[7] Export licensing restricts operation to a maximum velocity of 515 metres per second.

RoHS COMPLIANT
ISO 9001:2000 FM 92323