

# Leica MNS1200 GNSS Series Toughest GNSS solution for toughest sites



**GNSS**  
future proof



›Fast ›Smart ›Integrated



- when it has to be **right**

**Leica**  
Geosystems

# Leica MNS1200 GNSS Series

## Robust GNSS machine navigation solution

The Leica MNS1200 GNSS (Global Navigation Satellite System) machine navigation system is specifically designed for machine operation at toughest conditions. It combines extremely robust, waterproof system components with advanced GNSS technology at best performance. The new Leica SmartTrack+ measurement engine supports full GNSS signals (GPS L2C and GLONASS). Better satellite coverage means increased productivity, less downtime and better reliability for the machine operator.

The MNS1200 GNSS solution is easy for integration to machine control or guidance Software Packages as well as machine manufacturers.

Wherever you need an accurate and reliable position on a construction machine, the MNS1200 GNSS solution will provide it for you.



### Complete machine automation GNSS package – configure ease and flexibility

The Leica MNS1200 solution is the first complete machine automation GNSS package of Leica Geosystems that meets the demanding requirements of the construction and mining industry. Its robust components, consisting of the MNS1200(GG) receiver, the MNA1202GG antenna and the radio modem protection, are easy to integrate into the machine control environment of system integrators and machine manufacturers. The MNS1200 receivers feature a simple and well described remote interface (OWI – Outside World Interface control commands). Due to its robust housing, the Satelline radio modem can now be mounted on the machine as flexible as the receiver, directly coupled with the receiver or as stand-alone solution.

However the MNS1200 GNSS solution provides you even more flexibility. You can upgrade it to a survey rover featuring the versatile Leica System 1200 functionality. Use it for precise machine navigation, as survey rover for easy applications or as GNSS base station for RTK survey with highest performance.

The Leica MNS1200 GNSS solution is fully scalable – from meter level accuracy using GPS-only positioning to cm-accuracy with highest reliability by using additional GLONASS satellites in combination with Leica SmartTrack+ technology.

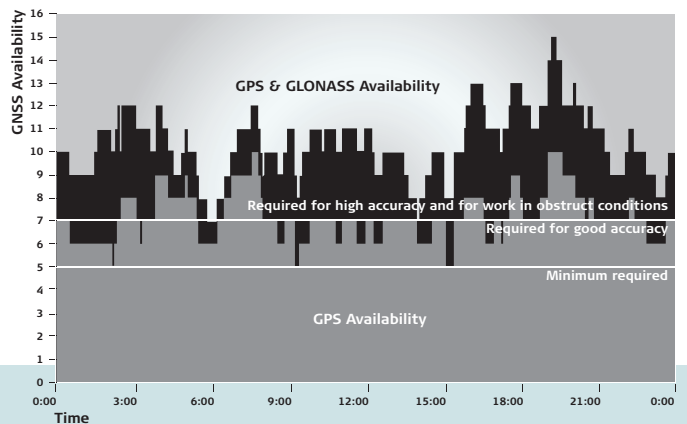


### Tough and resilient – meets toughest MIL specifications

The Leica MNS1200 GNSS Series is developed for precise machine navigation in demanding conditions. Built to the toughest MIL specifications, it withstands extreme temperatures, the worst weather and toughest site conditions. This makes it more versatile than other GPS machine navigation systems. Avoid downtime and keep your site productive.

All components are made as robust as possible:

- Aluminium casing; dust proof, water tight and salt air resistant
- Internal shock mounts in the receiver
- Operates at  $-40^{\circ}\text{C}$  to  $+65^{\circ}\text{C}$
- Connections
- Mounting brackets



### Improve productivity by the use of GPS and GLONASS satellites

Contractors cannot afford costly machine downtime due to insufficient satellites available for reliable 3D positioning. The Leica MNS1230GG (GPS and GLONASS) sensor utilizes new ultra-precise GNSS, 72 channel measurement engine that supports both GPS and GLONASS satellites and is designed to support also future GNSS signals such as GPS L5 and Galileo. More available satellites means higher productivity and efficiency for the user. Benefit from longer working times and reduce machine downtimes.

### Responsive performance due to Leica SmartTrack+ and SmartCheck+ technology

Getting the most accurate GNSS positions even at 20 times per second in realtime assures you that your operations are on track, which enables to drive faster. The Leica MNS1200 GNSS receivers with the state-of-the-art SmartTrack+ technology feature fast satellite acquisition and strongest signals that allows you to start almost immediately and work without interruption. Supporting GPS and GLONASS satellites, the MNS1200 GNSS Series optimises working around trees, in canyons, and sites with overhead obstructions. The unique Leica SmartCheck+ monitoring systems check all results immediately, providing you highest possible position reliability.





MNS1200 GNSS Receiver	
Dimensions	17.4 cm x 17.4 cm x 7.6 cm (excluding mounting flange and sockets)
Weight	2.7 kg
Supply voltage	10.5 to 28 V DC with voltage peak protection
Power consumption	3.8W typically, radio excluded
Power Protection	Fulfils EN13309 and Advanced Power Protection for Load-Dump
Ports	Cannon ITT male, 7pin; Power in / RS232 Cannon ITT female, 7pin: RS232 LEMO-1, 8 pin: RS232 LEMO-1, 8 pin: Port for RX1200 resp. RS232 TNC female: Antenna
Baud rate	up to 115'200 on all ports
Temperature (ISO 9022 & MIL-STD-810F)	-40° C to +65° C (operating) and -40° C to +80° C (storage)
Humidity (ISO 9022 & MIL-STD-810F)	Up to 100% compliance
Water, sand, dust and atmosphere conditions (IP66, IP67 & MIL-STD-810F)	Protected against water jets Waterproof for temporary submersion in water (max. depth of 1 meter) Dust-tight, protected against blowing dust Usable in salty atmosphere
Vibration, Shock (ISO 9022 & MIL-STD-810F)	Withstands vibrations and shocks during operation on large civil construction machines 10 Hz – 500 Hz; 7.5 mm; 5 g 10 Hz – 2000 Hz 40 g; 6 ms
Shock & vibration mounts	Internal mounts

MNS1200 GNSS Receiver	
Receiver Tracking Technology	SmartTrack+. Advanced GNSS Measurement technology. Very high sensitivity: acquires more than 99 % of all possible observations above 10 degrees elevation. Very low noise. Robust tracking. Tracks weak signals to low elevations and in adverse conditions. Multipath mitigation. Jamming resistant.
Receiver RTK Technology	SmartCheck+. Advanced, long range RTK technology. Range of 30 km or more in favorable conditions with reliability of 99.99 % with up to 20 Hz output rate. Self Checking ambiguity resolution background process.
No. of channels	12 L1 + 2 SBAS (MNS1210) 24 L1 / L2 + 2 SBAS (MNS1230) 72 channels: 28 L1 / L2 GPS + 2 SBAS + 24 L1 / L2 GLONASS (MNS1230 GG)
Time to first phase measurement	Typically 30 secs after switching ON
Position update rate	Selectable: 0.05 sec (20 Hz) to 60 secs
Position latency	0.03 sec or less
Kinematic Accuracy (phase), moving mode after initialization	Horizontal: 10 mm + 1 ppm Vertical: 20 mm + 1 ppm (MNS1230 GG / MNS1230)
Accuracy DGPS / RTCM	Typically 25 cm rms (MNS1230 GG / MNS1230) Typically 30 cm rms (MNS1210)
RTK / DGPS Data Formats for data transmission and reception	RTK: Leica proprietary, CMR, CMR+, RTCM V2.x/3.0 (MNS1230 and MNS1230 GG) DGPS: RTCM V2.x/3.0, WAAS and EGNOS (all MNS1200)
Reference station networks	RTK rover fully compatible with Leica Spider i-MAX & MAX formats, VRS and Area Correction (FKP) reference station networks.
Receiver Internal Memory	256 MB
NMEA output	NMEA 0183 V2.20 (GGA, GPK, GGQ, GLL, GNS, GSA, GSV, LLL, LLQ, RMC, VTG,...)
Receiver Operation	using OWI – Leica proprietary Outside World Interface. For receiver control commands from PC for Configuration, Control and Status. Using Leica Controller RX1210 / RX1250 Graphical Controller for Configuration, Control, Status and Survey



GNSS Antenna MNA1202 GG	
Supported Signals	L1/L2 GPS/GLONASS
Technology	SmartTrack+
Dimensions (diameter x height)	170 mm x 62 mm
Weight	0.44 kg
Phase centre stability	< 1 mm
Environment	Advanced vibration, shock and bump protection
Temperature (ISO 9022 & MIL-STD-810F)	-40° C to +70° C (Operating) and -55° C to +85° C (Storage)
Humidity (ISO 9022 & MIL-STD-810F)	Up to 100 %
Protection against water, sand and dust (IP66, IP67 & MIL-STD-810F)	Waterproof to temporary submersion into water (maximum depth of 1m) Dust-tight, protection against blowing dust
Drops	Withstands 1.5 m drop onto hard surfaces
Vibration (ISO 9022 & MIL-STD-810F)	Withstands vibrations during operation on large civil construction machines
Functional Shock	No loss of lock



Satel Housing MRH1201	
Supported Radios	Satel 2ASxe, Satel 2ASx, Satel 3AS or modems of same shape
Protection	IPx6; protection against water jets. Protects radio against dust, mud, gravel,...
Mounting possibility	inside / outside of cabin, engine compartment, roof or chassis MNS1200 + MMB1203 U-Bracket + Satel Housing is one common unit
Monitor of Radio	Window on housing allows full monitoring of Radio (Radio Display and Radio LEDs)



Benefits	Leica MNS1200 Series
Complete GNSS positioning solution for integration into different kind of machine control systems	✓
Easy communication language	✓
Full configuration and status request from remote computer or terminal	✓
Support of several RTK formats (Leica / CMR / CMR+ / RTCM) and network corrections (iMAX, VRS, FKP)	✓
Several NMEA output formats	✓
Withstands highest vibration and shock requirements to MIL and ISO standards	✓
Easy and flexible to mount on the machine	✓
Scalable from m-accuracy to cm-accuracy with highest reliability	✓
Position calculations from GPS and GLONASS satellites	GG Series
SmartTrack technology. Uses GPS signals to provide highest position reliability.	✓
SmartTrack+ technology. Uses full GNSS signals (GPS und GLONASS) to provide highest position reliability.	GG Series
More satellites means higher reliability, accuracy and productivity.	
SmartCheck ensures highest reliable positioning data by continuously checking the GPS position results.	✓
SmartCheck+ ensures highest reliable positioning data by continuously checking the GNSS position results.	GG Series
Processes GPS and GLONASS measurements together for cm-accuracy with 20Hz position updates even at 30km RTK range.	
Survey functionality	Option
Broad range of Onboard Applications for surveying tasks	Option



Photo: Atlas Copco



Asphalt, concrete or earth, shifting it or laying it. Whether you need simple laser height detection for excavators or need to control a concrete slipform paver to millimetres, Leica Geosystems can help you optimise site productivity with a complete range of machine automation solutions. Plan your own upgrade path to full 3D machine control workstations incorporating GPS navigation, terrain modelling software and automatic blade control. Dozers, graders, excavators, concrete pavers and asphalt finishers are just some of the construction machines that can be fitted with scaleable, tough and reliable Leica Geosystems construction machine automation systems. With a wide range of support services to choose from, Leica Geosystems helps master your site.

**When it has to be right.**

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**Total Quality Management – our commitment to total customer satisfaction.**

Ask your local Leica Geosystems dealer for more information about our TQM program.

**Head Office:**

Leica Geosystems AG  
9435 Heerbrugg, Switzerland  
Ph: +41 71 727 3131

**Technical Centers:**

Leica Geosystems Pty Ltd  
270 Gladstone Road  
Dutton Park, Brisbane  
QLD 4102 Australia  
Ph: +61 7 3891 9772

Leica Geosystems Inc  
5051 Peachtree Corners Circle  
Suite 250  
Norcross, GA 30092 USA  
Ph: +1 800 367 9453

**e-mail:**

construct@leica-geosystems.com



**Leica GradeSmart 3D**  
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