Leica GPS1200+

Technical specifications and system features

GPS1200+ receivers	GX1230+ GNSS/ ATX1230+ GNSS	GX1220+ GNSS	GX1230+	GX1220+	GX1210+
GNSS technology	SmartTrack+	SmartTrack+	SmartTrack	SmartTrack	SmartTrack
Type	Triple frequency	Triple frequency	Dual frequency	Dual frequency	Single frequency
Channels	120 channels L1/L2/L5 GPS L1/L2 GLONASS E1/E5a/ E5b/ Alt-BOC Galileo Compass[1] 4 SBAS	120 channels L1/L2/L5 GPS L1/L2 GLONASS E1/E5a/ E5b/ Alt-BOC Galileo Compass[1] 4 SBAS (with DGPS option)	16 L1 + 16 L2 GPS 4 SBAS	16 L1 + 16 L2 GPS 4 SBAS (with DGPS option)	16 L1 GPS 4 SBAS (with DGPS option)
Upgrade to GX1230+ GNSS	-	Yes	Yes	Yes	Yes
RTK	SmartCheck+	No	SmartCheck	No	No
Status indicators	3 LED indicators for GX1200+: power, tracking, memory				

GPS1200+ receivers	GX1230+ (GNSS)/ GX1220+ (GNSS)	GX1210+	ATX1230+ GNSS
Ports	1 power port, 3 serial ports, 1 controller port, 1 antenna port		1 power/controller port, *Bluetooth* ® Wireless-Technology port
Supply voltage,	Nominal 12 VDC		Nominal 12 VDC
Consumption	4.6 W receiver + controller + antenna		1.8 W
Event input and PPS	Optional: 1 PPS output port 2 event input ports	Optional: 1 PPS output port 2 event input ports	
Standard antenna	SmartTrack+ AX1203+ GNSS	SmartTrack AX1201	SmartTrack+ ATX1230+ GNSS
Built-in groundplane	Built-in groundplane	Built-in groundplane	Built-in groundplane

The following apply to all receivers except where stated.

Power supply	Two Li-Ion 4.4 Ah/7.4 V plug into receiver. One Li-Ion 2.2 Ah/7.4 V plugs into ATX1230+ GNSS and RX1250.
Plug-in Li-Ion batteries Same for GNSS and TPS	Power receiver + controller + SmartTrack antenna for about 17 hours (for data logging).
	Power receiver + controller + SmartTrack antenna + low power radio modem or phone for about 11 hours (for RTK/DGPS). Power SmartAntenna + RX1250 controller for about 6 hours (for RTK/DGPS)
External power	External power input 10.5 V to 28 V.
Weights	Receiver 1.20 kg. Controller 0.48 kg (RX1210) and 0.75 kg (RX1250). SmartTrack antenna 0.44 kg. SmartAntenna 1.12 kg. Plug-in Li-Ion battery 0.11 kg (2.2 Ah) and 0.2 kg (4.4 Ah)
	Carbon fiber pole with SmartTrack antenna and RX1210 controller: 1.80 kg.
	All on pole: carbon fiber pole with SmartAntenna, RX1250 controller and plug-in batteries: 2.74 kg.

Temperature	Operation:	Receiver	–40° C to +65° C
ISO9022		Antennas	–40° C to +70° C
MIL-STD-810F		Controllers	–30° C to +65° C
		Controller RX1250c	–30° C to +50° C
	Storage:	Receiver	–40° C to +80° C
		Antennas	–55° C to +85° C
		Controllers	–40° C to +80° C
		Controller RX1250c	–40° C to +80° C
Humidity	Receiver, antennas and controllers		
ISO9022, MIL-STD-810F	Up to 100 % humidity.		
Protection against water, dust and sand	Receiver, antennas and controllers: Waterpoof to 1 m temporary submersion.		
IP67, MIL-STD-810F	Dust tight		
Shock/drop onto hard surface	Receiver: withstands 1 m drop onto hard surface. Antennas: withstand 1.5 m drop onto hard surface.		
Topple over on pole	Receiver, antennas and controllers: withstand fall if pole topples over.		
Vibrations	Receiver, antennas and controllers:		
ISO9022	withstand vibrations on large construction		
MIL-STD-810F	machines. No loss of lock.		

[1] The Compass signal is not finalized, although, test signals have been tracked with GPS1200+ receivers in a test environment. As changes in the signal structure may still occur, Leica Geosystems cannot guarantee full Compass compatibility.

SmartTrack+ **Advanced GNSS measurement technology**	Time needed to acquire all satellites after switching on: typically about 50 seconds. Re-acquisition of satellites after loss of lock (e.g. passing through tunnel): typically within 1 second. 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. Measurement precision: Carrier phase on L1: 0.2 mm rms. On L2: 0.2 mm rms. Code (pseudorange) on L1 and L2: 20 mm rms.
SmartCheck+ **Advanced, long range RTK technology**	Initialization typically 8 seconds. Position update rate selectable up to 20 Hz. Latency < 0.03 secs. Range 40 km or more in favorable conditions. Self checking.
Accuracies	Kinematic Horizontal: 10 mm + 1 ppm Vertical: 20 mm + 1 ppm Static (ISO 17123-8) Horizontal: 5 mm + 0.5 ppm Vertical: 10 mm + 0.5 ppm Reliability: 99.99 % for baselines up to 40 km.
	Formats supported for transmission and reception: Leica proprietary (Leica, Leica 4G), CMR, CMR+, RTCM V2.1/2.2/2.3/3.0/3.1.
Reference station networks	RTK rover fully compatible with Leica's Spider i-MAX & MAX formats, VRS and Area Correction (FKP) reference station networks.
DGPS GX1230+ (GNSS), ATX1230+ GNSS, GX1220+ (GNSS) – standard GX1210+ – optional	DGPS, includes support of MSAS, WAAS, EGNOS and GAGAN. RTCM V2.1/2.2/2.3/3.0/3.1. formats supported for transmission and reception. Baseline rms: typically 25 cm rms with suitable reference station.
Position update rate and latency	Applies to RTK, DGPS and navigation positions. Update rate selectable from 0.05 sec (20 Hz) to 1 sec. Latency less than 0.03 secs.
NMEA output	NMEA 0183 V3.00 and Leica proprietary.
Post-processing with Leica Geo Office software **All GPS1200+ receivers**	Horizontal: 10 mm + 1 ppm, kinematic Vertical: 20 mm + 1 ppm, kinematic Horizontal: 5 mm + 0.5 ppm, static Vertical: 10 mm + 0.5 ppm, static For long lines with long observations Horizontal: 3 mm + 0.5 ppm, static Vertical: 6 mm + 0.5 ppm, static
Notes on performance and on accuracies	Figures quoted are for normal to favorable conditions. Performance and accuracies can vary depending on number of satellites, satellite geometry, observation time, ephemeris, ionosphere, multipath etc.

Controllers **RX1210/RX1250**	High contrast, 1/4 VGA display with colour option (RX1250) Touch screen, 11 lines x 32 characters. Windows CE 5.0 on RX1250. Full alphanumeric QWERTY keypad. Function keys and user definable keys. Illumination for screen and keys. Can also be used with TPS1200+ for alphanumeric input and extensive coding.
Operation with controller Same for GNSS and TPS	Via keypad and/or via touch screen. Graphical operating concept. Function keys and user definable keys. All information displayed.
Displayed information	All information displayed: status, tracking, data logging, database, RTK, DGPS, navigation, survey, stakeout, quality, timer, power, geographical, cartesian, grid coordinates etc.
Graphical display of survey Same for GNSS and TPS	Graphical display (plan) of survey. Zooming. Can access surveyed points directly via touch screen.
Stakeout display Same for GNSS and TPS	Graphical with zoom. Digital, polar and orthometric. Accuracy: 10 mm + 1 ppm at 20 Hz (0.05 sec) update rate. No degradation with high update rates.
Operation without controller GX1200+ only	Automatic on switching on. LED status indicators. For reference stations and static measurements.
Data logging Same cards used for GNSS and TPS	On CompactFlash cards: 256 MB and 1 GB Optional internal receiver memory: 256 MB.
Capacity	64 MB sufficient for (30 % less for GPS/GLONASS): About 500 hours L1 + L2 data logging at 15 sec rate. About 2 000 hours L1 + L2 data logging at 60 sec rate. About 90 000 RTK points with codes.
Data management Same for GNSS and TPS	User definable job management. Point identifiers, coordinates, codes, attributes etc. Search, filter and display routines. Multi point averaging. Five types of coding systems cover all requirements.
Coordinate systems Same for GNSS and TPS	Ellipsoids, projections, geoidal models, coordinate, transformations, transformation parameters, country specific coordinate systems. Fully support of RTCM 3.1 coordinate system transfer.
Application programs Same for GNSS and TPS	Standard: Full range of COGO functions. Hidden point. Optional: RoadRunner, Reference Line, DTM Stakeout, Reference Plane, Area Division and X-Section Survey, DXF Export, LandXML Export and Volume Calculations
Programmable Same for GNSS and TPS	User programmable in GeoC++. Users can write and upload programs for their own special requirements and applications.
Communication **Data links**	One or two of the following devices can be connected: Radio modem, GSM, GPRS, CDMA. Different frequencies and/or formats can be received and transmitted. Time slicing is supported.