Leica GPS1200 Series
Technical Data

GNSS
future proof

- when it has to be **right**

Leica
Geosystems

GPS1200 Technical Data

Summary Description

	GX1230 GG / ATX1230 GG	GX1220 GG	GX1230	GX1220	GX1210
Receiver type	Dual-frequency, GNSS, geodetic, real-time RTK receiver	Dual-frequency, GNSS, geodetic receiver	Dual-frequency, GPS only, geodetic, real-time RTK receiver	Dual-frequency, GPS only, geodetic receiver	Single-frequency, GPS only, survey receiver
Summary of measuring, modes and applications	Static, rapid static, kinematic On the fly L1 + L2, code, phase Real-time RTK standard Post processing DGPS/RTCM standard Survey, geodetic and real-time RTK applications	Static, rapid static, kinematic On the fly L1 + L2, code, phase Post processing DGPS/RTCM optional Survey and geodetic applications	Static, rapid static, kinematic On the fly L1 + L2, code, phase Real-time RTK standard Post processing DGPS/RTCM standard Survey, geodetic and real-time RTK applications	Static, rapid static, kinematic On the fly L1 + L2, code, phase Post processing DGPS/RTCM optional Survey and geodetic applications	Static, kinematic L1, code, phase DGPS/RTCM optional Survey and GIS applications

System Components

Receiver

	GX1230 GG / GX1220 GG / ATX1230 GG	GX1230	GX1220	GX1210
Receiver technology	SmartTrack+ is built on SmartTrack technology and enhanced for GNSS signals.	SmartTrack – patented. Discrete elliptical filters. Fast acquisition. Strong signal. Low noise. Excellent tracking, even to low satellites and in adverse conditions. Interference resistant.		
L5 and GALILEO prepared	Yes	Yes	Yes	Yes
No. of channels	72 channels 14 L1 + 14 L2 GPS 2 SBAS 12 L1 + 12 L2 GLONASS ⇨ GX1220 GG (with DGPS option)	14 L1 + 14 L2 GPS 2 SBAS	14 L1 + 14 L2 GPS 2 SBAS (with DGPS option)	14 L1 GPS 2 SBAS (with DGPS option)
L1 measurements (GPS)	Carrier phase full wave length C/A narrow code	Carrier phase full wave length C/A narrow code	Carrier phase full wave length C/A narrow code	Carrier phase full wave length C/A narrow code
L2 measurements (GPS)	Carrier phase full wave length with C-code and P-code (AS off) or P-code aided under AS Equal performance with AS off or on	Carrier phase full wave length with C-code and P-code (AS off) or P-code aided under AS Equal performance with AS off or on	Carrier phase full wave length with C-code and P-code (AS off) or P-code aided under AS Equal performance with AS off or on	No
L1 measurements (GLONASSS)	Carrier phase full wave length C/A narrow code	No	No	No
L2 measurements (GLONASS)	Carrier phase full wave length P narrow code	No	No	No

Independent measurements	Fully independent L1 and L2 code and phase measurements	Fully independent L1 and L2 code and phase measurements	Fully independent L1 and L2 code and phase measurements	Fully independent L1 code and phase measurements
Time to first phase measurement after switching ON	Typically 30 secs	Typically 30 secs	Typically 30 secs	Typically 30 secs

Receiver Housing

	ATX1230 GG	GX1230 GG / GX1220 GG / GX1230 / GX1220 / GX1210
LED status indicators	3: for power, tracking, Bluetooth	3: for power, tracking, memory
Ports	1 RS232 clip-on port 1 USB/RS232 port 1 Bluetooth port	4 RS232 port 1 Power only port 1 TNC port for antenna 1 PPS, 2 Event port optional
Supply voltage Power consumption	Nominal 12V DC Range 10.5-28V DC Typically 1.8W, 150mA	Nominal 12V DC Range 10.5-28V DC Typically 3.2W, 270mA
Dimensions	186mm x 89mm	0.212m x 0.166m x 0.079m (The dimensions are given for the housing without the sockets)
Weight, receiver only	1.12kg	1.2kg

GNSS Antennas

	GX1230 GG / GX1220 GG	GX1220 / GX1230	GX1210
Standard survey antenna	**AX1202 GG, L1/L2 SmartTrack+**	**AX1202 GG, L1/L2 SmartTrack+**	**AX1201, L1 SmartTrack**
Groundplane Dimensions (diameter x height) Weight Gain	Built-in groundplane 170mm x 62mm 0.44kg 29±3 dbi	Built-in groundplane 170mm x 62mm 0.44kg 29±3 dbi	Built-in groundplane 170mm x 62mm 0.44kg typically 27 dbi
Choke-ring antenna	**AT504 GG choke-ring, L1/L2 GPS/GLONASS microstrip**	**AT504 choke-ring, L1/L2 microstrip. (GPS only)**	**No**
Design Protection radome Dimensions: diameter x ht Weight Gain	Dorne Margolin, JPL design. optional 380mm x 140mm (antenna) 4.3kg (antenna) 29±3 dbi	Dorne Margolin, JPL design. optional 380mm x 140mm (antenna) 4.3kg (antenna) typically 27 dbi	

SmartAntenna

	ATX1230 GG
Standard survey antenna	**ATX1230 GG, L1/L2 SmartTrack+**
Groundplane Dimensions (diameter x height) Weight Gain	Built-in groundplane 186mm x 89mm 1,12kg typically 27 dbi

Controller

	ATX1230 GG GX1230 GG / GX1230 GX1220 GG / GX1220 GX1210
Type	RX1210, RX1210T (with touch screen) for GX1230 GG/GX1230/GX1220 GG/GX1220/GX1210 RX1250 (with touch screen), RX1250c (with touch screen and colour display) for ATX1230 GG
Display	¼ VGA, optional monochrome or colour, graphics capable, illumination
Character Set	Maximum 256 characters, extended ASCII characters set
Touch screen (RX1210T only)	Toughened film on glass
Keyboard	Full alphanumeric (62 keys), 12 function keys, 6 user-definable keys, illumination
Controller Weights	RX1210 0.48kg RX1250 0.75kg incl. GEB211 internal Battery
Total Weights of System	SmartRover 2.79kg (all on the pole) GX1200 Rover 4.15kg (all on the pole) GX1200 Rover 1.80kg (weight of pole for Minipack setup)

Measurement Precision and Position Accuracies

	ATX1230 GG GX1230 GG / GX1230	GX1220 GG / GX1220	GX1210
Important Note	Measurement precision and accuracy in position and accuracy in height are dependent upon various factors including number of satellites, geometry, observation time, ephemeris accuracy, ionospheric conditions, multipath etc. Figures quoted assume normal to favourable conditions. Times required are dependent upon various factors including number of satellites, geometry, ionospheric conditions, multipath etc. GPS and GLONASS can increase performance and accuracy by up to 30% relative to GPS only. The following accuracies, given as **r**oot **m**ean **s**quare, are based on measurements processed using LGO and on real-time measurements.		

Code and Phase Measurement Precision (irrespective whether AS off/on)

	ATX1230 GG GX1230 GG / GX1230	GX1220 GG / GX1220	GX1210
Carrier phase on L1	0.2mm rms	0.2mm rms	0.2mm rms
Carrier phase on L2	0.2mm rms	0.2mm rms	
Code (pseudorange) on L1	2cm rms	2cm rms	2cm rms
Code (pseudorange) on L2	2cm rms	2cm rms	

Accuracy (rms) with post processing

	ATX1230 GG GX1230 GG / GX1230	GX1220 GG / GX1220	GX1210
	With LEICA Geo Office L1/L2 processing software. GLONASS processing option also needed to process GLONASS data	With LEICA Geo Office L1/L2 processing software GLONASS processing option also needed to process GLONASS data	With LEICA Geo Office L1 processing software
Static (phase), long lines, long observations, choke ring antenna	Horizontal: 3mm + 0.5ppm Vertical: 6mm + 0.5ppm	Horizontal: 3mm + 0.5ppm Vertical: 6mm + 0.5ppm	Not applicable
Static and rapid static (phase) with standard antenna)	Horizontal: 5mm + 0.5ppm Vertical: 10mm + 0.5ppm	Horizontal: 5mm + 0.5ppm Vertical: 10mm + 0.5ppm	Horizontal: 5mm + 0.5ppm Vertical: 10mm + 0.5ppm
Kinematic (phase), in moving mode after initialization	Horizontal: 10mm + 1ppm Vertical: 20mm + 1ppm	Horizontal: 10mm + 1ppm Vertical: 20mm + 1ppm	
Code only	Typically 25cm	Typically 25cm	Typically 25cm

Accuracy (rms) with real-time/RTK

	ATX1230 GG GX1230 GG / GX1230	GX1220 GG / GX1220	GX1210
RTK capability	Yes, standard	No	No
Rapid static (phase), Static mode after initialization (compliance with ISO17123-8)	Horiz: 5mm + 0.5ppm Vertical: 10mm + 0.5ppm		
Kinematic (phase), moving mode after initialization	Horiz: 10mm + 1ppm Vertical: 20mm + 1ppm		
Code only	Typically 25cm		

Accuracy (rms) with DGPS/RTCM

	ATX1230 GG GX1230 GG / GX1230	GX1220 GG / GX1220	GX1210
	DGPS/RTCM standard	DGPS/RTCM optional	DGPS/RTCM optional
DGPS/RTCM	Typically 25cm (rms)	Typically 25cm (rms)	Typically 25cm (rms)

Accuracy (rms) in single receiver navigation mode

	ATX1230 GG GX1230 GG / GX1230	GX1220 GG / GX1220	GX1210
Navigation accuracy	5–10m rms for each coordinate	5–10m rms for each coordinate	5–10m rms for each coordinate
Degradation effect	Degradation possible due to SA	Degradation possible due to SA	Degradation possible due to SA

On-the-Fly (OTF) initialisation

	ATX1230 GG GX1230 GG / GX1230	GX1220 GG / GX1220	GX1210
OTF Capability	Real time and post processing	Post processing only	No OTF
Reliability of OTF initialisation	Better than 99.99%	Not applicable	Not applicable
Time for OTF initialisation	Typically 8secs, with 5 or more satellites on L1 and L2	Not applicable	Not applicable
OTF Range* *Assuming reliable data-link is available in RTK case	Typically up to 30km in normal conditions Up to 40km in favorable conditions	Not applicable Not applicable	Not applicable

Position update and latency

	ATX1230 GG GX1230 GG / GX1230	GX1220 GG / GX1220	GX1210
	RTK and DGPS standard	DGPS optional	DGPS optional
Position update rate	Selectable: 0.05 sec (20Hz) to 60 secs	Selectable: 0.05 sec (20Hz) to 60 secs	Selectable: 0.05 sec (20Hz) to 60 secs
Position latency	0.03 sec or less	0.03 sec or less	0.03 sec or less