

Leica Viva GNSS GS15 receiver Datasheet



Proven GNSS technology

Built on years of knowledge and experience, the Leica GS15 delivers the hallmarks of Leica GNSS – reliability and accuracy.

- Leica SmartCheck – RTK data-processing to guarantee correct results
- Leica SmartTrack – advanced four constellation tracking of all GNSS satellites today and tomorrow
- Leica xRTK – delivers more positions in difficult environments.



Work as you want to

The Leica GS15 is designed to suit any surveying task.

- Built-in exchangeable communication devices for field base stations and RTK rovers with removable SIM cards
- Fully scalable sensor allows you to buy only what you need today and upgrade with additional functionality as you need it
- Integrated web server to configure the logging of Leica or RINEX raw data and measure with one button press in the field

IP68

Rugged

The Leica GS15 is built for the most demanding environments.



- IP68 protection against dust and continuous immersion
- Built for extreme temperatures of -40°C to $+65^{\circ}\text{C}$
- Integrated antenna technology to avoid breaking, losing or forgetting antenna

- when it has to be **right**

Leica
Geosystems

Technical Specifications



Leica GS15 GNSS receiver	Leica GS15 Single Frequency	Leica GS15 Performance	Leica GS15 Professional
Supported GNSS Systems			
GPS L2	○	●	●
GPS L5	○	○	●
GLONASS	○	○	●
Galileo	○	○	●
BeiDou	○	○	○
RTK performance			
DGPS / RTCM	○	●	●
RTK up to 5 km	○	●	●
RTK unlimited	○	●	●
Network RTK	○	●	●
Leica Lite RTK	○	○	●
Position update & data recording			
5 Hz positioning	●	●	●
20 Hz positioning	○	●	●
Raw data logging	●	●	●
RINEX logging	○	○	●
NMEA out	○	○	●
Additional features			
RTK Reference Station functionality	○	●	●
		● = Standard	○ = Optional
GNSS Performance			
	GNSS technology	Leica patented SmartTrack technology: <ul style="list-style-type: none"> • Advanced measurement engine • Jamming resistant measurements • High precision pulse aperture multipath correlator for pseudorange measurements • Excellent low elevation tracking • Very low noise GNSS carrier phase measurements with < 0.5 mm precision • Minimum acquisition time 	
	No. of channels	120 channels	
	Max. simultaneous tracked satellites	Up to 60 Satellites simultaneously on two frequencies	
	Satellite signals tracking	<ul style="list-style-type: none"> • GPS: L1, L2, L2C, L5 • GLONASS: L1, L2 • Galileo (Test): GIOVE-A, GIOVE-B • Galileo: E1, E5a, E5b, Alt-BOC • BeiDou: B1, B2 • SBAS: WAAS, EGNOS, GAGAN, MSAS, QZSS 	
	GNSS measurements	Fully independent code and phase measurements of all frequencies <ul style="list-style-type: none"> • GPS: carrier phase full wave length, Code (C/A, P, C Code) • GLONASS: carrier phase full wave length, Code (C/A, P narrow Code) • Galileo: carrier phase full wave length, Code • BeiDou: carrier phase full wave length, Code 	
	Reacquisition time	< 1 sec	
Measurement Performance & Accuracy			
	Accuracy (rms) Code differential with DGPS / RTCM¹		
	DGPS / RTCM	Typically 25 cm (rms)	
	Accuracy (rms) with Real-Time (RTK)¹		
	Standard of compliance	Compliance with ISO17123-8	
	Rapid static (phase)	Horizontal: 5 mm + 0.5 ppm (rms)	
	Static mode after initialization	Vertical: 10 mm + 0.5 ppm (rms)	
	Kinematic (phase)	Horizontal: 10 mm + 1 ppm (rms)	
	Moving mode after initialization	Vertical: 20 mm + 1 ppm (rms)	
	Accuracy (rms) with Post Processing¹		
	Static (phase) with long observations	Horizontal: 3 mm + 0.1 ppm (rms)	
		Vertical: 3.5 mm + 0.4 ppm (rms)	
	Static and rapid static (phase)	Horizontal: 5 mm + 0.5 ppm (rms)	
		Vertical: 10 mm + 0.5 ppm (rms)	
	Kinematic (phase)	Horizontal: 10 mm + 1 ppm (rms)	
		Vertical: 20 mm + 1 ppm (rms)	
On the Fly (OTF) Initialization			
RTK technology	Leica SmartCheck technology		
Reliability of OTF initialization	Better than 99,99% ¹		
Time for initialization	Typically 4 sec ²		
OTF range	up to 70 km ²		
Network RTK			
Supported RTK network solutions	VRS, FKP, iMAX		
Supported RTK network standards	MAC (Master Auxiliary Concept) approved by RTCM SC 104		

¹ Measurement precision, accuracy and reliability are dependent upon various factors including number of satellites, geometry, obstructions, observation time, ephemeris accuracy, ionospheric conditions, multipath etc. Figures quoted assume normal to favorable 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. A full Galileo and GPS L5 constellation will further increase measurement performance and accuracy.

² Might vary due to atmospheric conditions, signal multipath, obstructions, signal geometry and number of tracked signals.

³ Might vary with temperatures, age of battery, transmit power of data link device.

Leica GS15 GNSS receiver

Hardware



Weight & Dimensions	
Weight (GS15)	1.34 kg
Weight	3.30 kg standard RTK rover including slot RTK device, controller, batteries pole and bracket
Dimension (GS15) (diameter x height)	196 mm x 198 mm
Environmental specifications	
Temperature, operating	-40° C to +65° C, compliance with ISO9022-10-08, ISO9022-11-special, MIL STD 810F - 502.4-II, MIL STD 810F - 501.4-II
Temperature, storage	-40° C to +80° C, compliance with ISO9022-10-08, ISO9022-11-special, MIL STD 810F - 502.4-II, MIL STD 810F - 501.4-II
Humidity	100%, compliance with ISO9022-13-06, ISO9022-12-04 and MIL STD 810F - 507.4-I
Proof against: water, sand and dust	IP68 according IEC60529 and MIL STD 810F - 506.4-I, MIL STD 810F - 510.4-I and MIL STD 810F - 512.4-I Protected against blowing rain and dust Protected against temporary submersion into water (max. depth 1,4 m)
Vibration	Withstands strong vibration during operating, compliance with ISO9022-36-08 and MIL STD 810F - 514.5-Cat.24
Drops	Withstands 1.0 m drop onto hard surfaces
Functional shock	40 g / 15 to 23 msec, compliance with MIL STD 810F - 516.5-I No loss of lock to satellite signal when used on a pole set-up and submitted to pole bumps up to 150 mm
Topple over	Withstands topple over from a 2 m survey pole onto hard surfaces
Power & Electrical	
Supply voltage	Nominal 12 V DC Range 10.5 - 28 V DC
Power consumption	Typically: 3.2 W, 270 mA
Internal power supply	Recharge & removable Li-Ion battery, 2.6 Ah / 7.4 V, 2 batteries fit into receiver
Internal power supply, operation time	<ul style="list-style-type: none"> • 10.00 h receiving RTK data with standard radio³ • 9.00 h transmitting RTK data with standard radio³ • 7.50 h RTK via GSM/GPRS connection³ using 2 internal batteries
External power supply	Rechargeable external NiMH battery 9 Ah / 12 V
Certifications	Compliance to: FCC, CE Local approvals (as IC Canada, C-Tick Australia, Japan, China)

Memory & Data Recording



Memory	
Memory medium	Removable SD Card: 1 GB
Data capacity	1 GB is typically sufficient for about GPS & GLONASS (8+4 satellites) 280 days raw data logging at 15 s rate
Data recording	
Type of data	Onboard recording of: <ul style="list-style-type: none"> • Leica GNSS raw data • RINEX data
Recording rate	Up to 20 Hz

User Interface



Buttons	<ul style="list-style-type: none"> • ON / OFF button • Function button
Button functionality	Function button: <ul style="list-style-type: none"> • Easy switch between Rover / Base mode • Easy "Here" positioning functionality
Led status indicator	Bluetooth®, position, RTK status, data logging, detailed power status
Additional user interface	Additional web interface functionality provides full status indicator and configuration options

Communications



Communication ports	1 x serial RS232 Lemo 1 x USB / RS232 Lemo 1 x UART serial & USB (for removable internal RTK devices) 1 x Bluetooth® port, Bluetooth® v2.00+ EDR, class 2
No. of simultaneous data links	<ul style="list-style-type: none"> • Up to 3 data links can be attached and used simultaneously • 2 real-time output interfaces via independent ports, providing identical or different RTK/ RTCM formats
Built in data links	
Radio modems	<ul style="list-style-type: none"> • Fully integrated, fully sealed receive / transmit radios • User exchangeable device • SATEL, Pacific Crest and others • 390 - 470 MHz bandwidth • Transmit power: 0.5 - 1.0 W
Radio modems	<ul style="list-style-type: none"> • Fully integrated, fully sealed receive / transmit radios • User exchangeable device • SATEL, Pacific Crest and others • 390 - 470 MHz bandwidth • Transmit power: 0.5 - 1.0 W
UHF antenna options	<ul style="list-style-type: none"> • Fully integrated UHF antenna • External UHF antenna connector (Type QN)
3G GSM / UMTS(HSDPA) phone modem	<ul style="list-style-type: none"> • Fully integrated, fully sealed phone modem • User exchangeable device • User exchangeable SIM card • Tri-Band UMTS / HSDPA: 850 / 1900 / 2100 MHz • Quad-Band GSM / GPRS: 850 / 900 / 1800 / 1900 MHz
CDMA phone modem	<ul style="list-style-type: none"> • Fully integrated, fully sealed CDMA phone modem • User exchangeable device • Dual-Band CDMA 1XRTT (800 / 1900 MHz)
GSM / UMTS / CDMA antenna options	<ul style="list-style-type: none"> • Integrated GSM / UMTS / CDMA antenna • External GSM / UMTS / CDMA antenna connector (Type QN)
External data links	
Radio modems	Support of any suitable UHF / VHF radio
GSM / UMTS / CDMA phone modems	Support of any suitable GSM / GPRS / UMTS / CDMA modem
Landline phone modems	Support of any suitable Landline phone modem
Communication protocols	
Real-Time data formats for data transmission and reception	Leica proprietary formats (Leica, Leica 4G) CMR, CMR+
Real-Time data formats according RTCM standard for data transmission and reception	RTCM 2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1
NMEA output	NMEA 0183 V 4.00 and Leica proprietary

Whether you want to stake-out an object on a construction site or you need accurate measurements of a tunnel or a bridge; whether you want to determine the area of a parcel of land or need the position of a power pole or to capture objects for as-built maps – you need reliable and precise data.

Leica Viva combines a wide range of innovative products designed to meet the daily challenges for all positioning tasks. The simple yet powerful and versatile Leica Viva hardware and software innovations are redefining state-of-the-art technology to deliver maximum performance and productivity. Leica Viva gives you the inspiration to make your ambitious visions come true.

When it has to be right.

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by Leica Geosystems



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