

# Leica Viva GNSS GS14 receiver Datasheet



## Proven GNSS Technology

Built on years of knowledge and experience, the Leica GS14 delivers the hallmarks of Leica GNSS – reliability and accuracy.

- Leica SmartCheck – RTK data-processing to guarantee correct results
- Leica SmartTrack – best measurement data quality in all environments
- Leica xRTK – delivers more positions in difficult environments



## Flexibility

The Leica GS14 is designed to suit any measuring task.

- Integrated mobile communications and UHF radio modems (receive and transmit)
- Fully scalable sensor allows you to buy only what you need today and upgrade with additional functionality as you need it
- Integrated web server





## Rugged

The Leica GS14 is built for the most demanding environments.

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

# Technical Specifications



Leica GS14 GNSS Receiver	Leica GS14 Single Frequency	Leica GS14 Performance	Leica GS14 Professional
<b>Supported GNSS systems</b>			
GPS L2	○	●	●
GLONASS	○	○	●
Galileo	○	○	●
BeiDou	○	○	○
<b>RTK Performance</b>			
DGPS / RTCM	○	●	●
RTK unlimited	○	●	●
Network RTK	○	●	●
<b>Position Update &amp; Data Recording</b>			
5 Hz positioning	●	●	●
20 Hz positioning	○	●	●
Raw data logging	●	●	●
RINEX logging	○	○	●
NMEA out	○	○	●
<b>Additional Features</b>			
RTK reference station functionality	○	●	●
Modem (choice of 2G or 3.75G)	●	●	●
UHF radio modem (receive and transmit)	○	○	○
		● = Standard	○ = Optional
<b>GNSS Performance</b>			
	GNSS technology	Leica patented SmartTrack technology: <ul style="list-style-type: none"> <li>• Advanced measurement engine</li> <li>• Jamming resistant measurements</li> <li>• High precision pulse aperture multipath correlator for pseudorange measurements</li> <li>• Excellent low elevation tracking</li> <li>• Very low noise GNSS carrier phase measurements with &lt; 0.5 mm precision</li> <li>• Minimum acquisition time</li> </ul>	
	No. of channels	120 channels (240 channels) <sup>1</sup>	
	Max. simultaneous tracked satellites	Up to 60 Satellites simultaneously on two frequencies	
	Satellite signals tracking	<ul style="list-style-type: none"> <li>• GPS: L1, L2, L2C</li> <li>• GLONASS: L1, L2</li> <li>• Galileo, QZSS<sup>2</sup></li> <li>• BeiDou<sup>1</sup></li> <li>• SBAS: WAAS, EGNOS, GAGAN, MSAS</li> </ul>	
	Reacquisition time	< 1 sec	
	Position latency	Typically 0.02 sec	
	<b>Measurement Performance &amp; Accuracy</b>		
	<b>Accuracy (rms) code differential with DGPS / RTCM<sup>3</sup></b>		
	DGPS / RTCM	Typically 25 cm	
	<b>Accuracy (rms) with Real-time-Kinematic (RTK)<sup>3</sup></b>		
	Standard of compliance	Compliance with ISO17123-8	
	Single Baseline (< 30 km)	Horizontal: 8 mm + 1 ppm Vertical: 15 mm + 1 ppm	
	Network RTK	Horizontal: 8 mm + 0.5 ppm Vertical: 15 mm + 0.5 ppm	
	<b>Accuracy (rms) with post processing<sup>2</sup></b>		
	Static (phase) with long observations	Horizontal: 3 mm + 0.1 ppm Vertical: 3.5 mm + 0.4 ppm	
	Static and rapid static (phase)	Horizontal: 3 mm + 0.5 ppm Vertical: 5 mm + 0.5 ppm	
	Kinematic (phase)	Horizontal: 8 mm + 1 ppm Vertical: 15 mm + 1 ppm	
	<b>On-the-fly (OTF) Initialisation</b>		
	RTK technology	Leica SmartCheck technology	
	Reliability	Better than 99.99% <sup>3</sup>	
	Time for initialisation	Typically 4 sec <sup>4</sup>	
	OTF range	Up to 70 km <sup>2</sup>	
<b>Network RTK</b>			
Supported RTK network solutions	VRS, FKP, iMAX		
Supported RTK network standards	MAC (Master Auxiliary Concept) approved by RTCM SC 104		

<sup>1</sup> Future upgrade possibility to 240 channels including GPS L5 and BeiDou.

<sup>2</sup> Support of QZSS is incorporated and will be provided through firmware upgrade.

<sup>3</sup> 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 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.

<sup>4</sup> Might vary due to atmospheric conditions, signal multipath, obstructions, signal geometry and number of tracked signals.

## Leica GS14 GNSS Receiver

### Hardware



Weight & Dimensions	
Weight (GS14)	0.93 kg
Weight	2.90 kg standard RTK rover including controller, batteries, pole and bracket
Dimension (GS14) (diameter x height)	190 mm x 90 mm
Environmental Specifications	
Temperature, operating	-40° C to +65° C, compliance with ISO9022-10-08, ISO9022-11-special, MIL STD 810G Method 502.5 II, MIL STD 810G Method 501.5 II
Temperature, storage	-40° C to +80° C, compliance with ISO9022-10-08, ISO9022-11-special, MIL STD 810G Method 502.5 I, MIL STD 810G Method 501.5 I
Humidity	100%, compliance with ISO9022-13-06, ISO9022-12-04 and MIL STD 810G Method 507.5 I
Proof against: water, sand and dust	IP68 according IEC60529 and MIL STD 81G Method 506.5 I, MIL STD 810G Method 510.5 I and MIL STD 810G Method 512.5 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 810G Method 514.6 Cat.24
Drops	Withstands 1.0 m drop onto hard surfaces
Functional shock	40 g / 15 to 23 msec, compliance with MIL STD 810G Method 516.6 I No loss of lock to satellite signal when used on a pole set-up and submitted to pole bumps up to 100 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: 2.0 W, 270 mA UHF transmit: 3.3 W, 270 mA
Internal power supply	Recharge & removable Li-Ion battery, 2.6 Ah / 7.4 V, 1 battery fit into receiver
Internal power supply, operation time	<ul style="list-style-type: none"> <li>• 10.00 h static observations<sup>5</sup></li> <li>• 7.00 h receiving RTK data with internal UHF radio<sup>5</sup></li> <li>• 5.00 h transmitting RTK data with internal UHF radio<sup>5</sup></li> <li>• 6.00 h receiving / transmitting RTK data with internal modem<sup>5</sup></li> </ul>
External power supply	Rechargeable external NiMH battery 9 Ah / 12 V
Certifications	Compliance to: FCC, CE, PTCRB Local and operator specific approvals (as IC Canada, C-Tick Australia, Japan, China, AT&T)

### Memory & Data Recording



Memory	
Memory medium	Removable microSD 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"> <li>• Leica GNSS raw data</li> <li>• RINEX data</li> </ul>
Recording rate	Up to 20 Hz

### User Interface



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

### Communications



Communication ports	1 x USB / RS232 Lemo 1 x Bluetooth® port, Bluetooth® v2.00+ EDR, class 2
Built-in Data Links	
Radio modem	<ul style="list-style-type: none"> <li>• Fully integrated, fully sealed receive and transmit radios</li> <li>• SATEL, Pacific Crest and TrimTalk support</li> <li>• 403 – 473 MHz bandwidth</li> <li>• Output power 1W max.</li> </ul>
UHF antenna options	<ul style="list-style-type: none"> <li>• External UHF antenna connector (Type QN)</li> </ul>
GSM / UMTS phone modem	<ul style="list-style-type: none"> <li>• Fully integrated, fully sealed 3.75G phone modem</li> <li>• Quad-Band GSM / GPRS: 850 / 900 / 1800 / 1900 MHz</li> <li>• Penta-Band UMTS: 800 / 850 / 900 / 1900 / 2100 MHz</li> <li>• DynDNS service support – Base station supports up to 10 rovers via TCP/IP</li> </ul>
GSM / UMTS antenna	<ul style="list-style-type: none"> <li>• Integrated GSM / UMTS antenna</li> </ul>
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, RTCM 3.2 MSM Full support of RTCM 3 Transformation Message
NMEA output	NMEA 0183 V 4.00 and Leica proprietary

<sup>5</sup> Might vary with temperatures, age of battery, transmit power of data link device.



Scan with your iPhone or iPad to get the Leica Viva GNSS App or visit [www.leica-geosystems.com/viva-gnss](http://www.leica-geosystems.com/viva-gnss)

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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