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, availability and accuracy.

- Leica SmartCheck – RTK data-processing to guarantee correct results
- Leica SmartTrack – advanced four constellation tracking guarantees most accurate signals
- Leica xRTK – delivers more positions in difficult environments

Unlimited Series

The Leica GS15 Unlimited is your safe investment for the future.

- Future proof – lean back and observe GNSS modernisation with future proof hardware
- SmartLink – bridges RTK communication gaps up to 10 minutes
- GPS, Glonass, Galileo and BeiDou provide maximum performance. Additional support of BeiDou only and Glonass only positioning.

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°C
- Integrated intenna technology to avoid breaking, losing or forgetting antenna

- when it has to be **right**

Technical Specifications

Leica GS15 GNSS Receiver	Leica GS15 Single Frequency	Leica GS15 Performance	Leica GS15 Professional	Leica GS15 Unlimited
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	○	○	●	●
SmartLink (L-band)	○	○	○	●
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: • 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 / 500+[1] channels
Max. simultaneous tracked satellites	Up to 60 satellites simultaneously on two frequencies
Satellite signals tracking	• GPS: L1, L2, L2C, L5 • GLONASS: L1, L2 • Galileo: E1, E5a, E5b, Alt-BOC • BeiDou: B1, B2 • QZSS: L1, L2, L5[2] • L-band • SBAS: WAAS, EGNOS, GAGAN, MSAS
GNSS measurements	Fully independent code and phase measurements of all frequencies • 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
Position latency	Typically 0.02 sec

Measurement Performance & Accuracy

Accuracy (rms) Code differential with DGPS / RTCM[3]	
DGPS / RTCM	Typically 25 cm

Accuracy (rms) with Real-time-Kinematic (RTK)[3]	
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

Accuracy (rms) with Post Processing[3]	
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

On-the-fly (OTF) Initialisation	
RTK technology	Leica SmartCheck technology
Reliability of OTF initialisation	Better than 99,99%[3]
Time for initialisation	Typically 4 sec[4]
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] The Unlimited series has free future upgrade to 500+ channels.

[2] Support of QZSS is incorporated and will be provided through firmware upgrade.

[3] 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. A full BeiDou, Galileo and GPS L5 constellation will further increase measurement performance and accuracy.

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

[5] 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	
Operating temperature	–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
Storage temperature	–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 810G 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 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	• 10.00 h receiving RTK data with standard radio[5] • 9.00 h transmitting RTK data with standard radio[5] • 7.50 h RTK via GSM/GPRS connection[5] 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: • Leica GNSS raw data • RINEX data
Recording rate	Up to 20 Hz

User Interface

Buttons	• ON / OFF button • Function button
Button functionality	Function button: • 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	• 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	• Fully integrated, fully sealed receive / transmit radios • User exchangeable device • SATEL, Pacific Crest and TrimTalk support • 390 – 470 MHz bandwidth • Transmit power: 0.5 – 1.0 W
UHF antenna options	• Fully integrated UHF antenna • External UHF antenna connector (Type QN)
GSM / UMTS phone modem	• Fully integrated, fully sealed 3.5G phone modem • User exchangeable device • Tri-Band UMTS / HSDPA: 850 / 1900 / 2100 MHz • Quad-Band GSM / GPRS: 850 / 900 / 1800 / 1900 MHz • DynDNS service support – Base station supports up to 10 rovers via TCP/IP
CDMA phone modem	• Fully integrated, fully sealed CDMA phone modem • User exchangeable device • Dual-Band CDMA 1XRTT (800 / 1900 MHz)
GSM / UMTS / CDMA antenna options	• 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, RTCM 3.2 MSM Full support of RTCM 3 Transformation Message
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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Product brochure

Leica Viva SmartPole
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