# Leica Viva GNSS GS12 receiver

## Datasheet









#### **Proven GNSS Technology**

Built on years of knowledge and experience, the Leica GS12 delivers the hallmarks of Leica GNSS – reliability and accuracy.

- SmartCheck RTK data-processing to guarantee correct results
- SmartTrack best measurement data quality in all environments
- SmartRTK delivers consistent results in all networks



#### Light Weight and full functionality

The Leica GS12 delivers ultimate ergonomics through extreme light weight.

- Weight of only 1kg for ergonomic handling with ideal balance
- Fully scalable sensor allows you to buy only what you need today and upgrade with additional functionality as you need it
- Full RTK connectivity together with Leica Viva CS10/CS15 using UMTS, GPRS, GSM or CGR radio devices



#### Rugged

The Leica GS12 is built for the most demanding environments.

- IP68 protection against dust and continuous immersion
- Withstands 2m pole topple over test
- Built for extreme temperatures of -40° C to +65° C
- Complete cable free operation





### **Technical Specifications**

Advanced measurement lengue
Loric patented SmartTrack technology  Loric patented SmartTrack technology  Loric patented SmartTrack technology  Loric patented SmartTrack technology  Loric patented SmartTrack Loric patented Smart Smart Sport Loric patented Smart Smart Smart Sport Loric patented Smart Sm
Me. arindateous traided satellites  Reacquision time  GNS: Measurements  Satellite signuls tracking  GPS: L1, L2 (CA, P, C Code)  GDAMSS: L1, L2 (CA, P, C C C C C C C C C C C C C C C C C C
Recouption time  GNSS Measurements  Satellite signals tracking  CPS-L1, L2, L2C, L5 (CAP, P. Code)  CLOWASS, L1, L2, CAP, P. Parmor Code): Calibro (Text): GTOVE-A, CHOVE-B; Calibro (Text): GTOVE-A, CHOVE-A, CHOVE-B; Calibro (Text): GTOVE-A, CHOVE-B; Calibro (Text): GTOVE-B; Calibro (Text)
Accuracy (rms)!  DCF-STRTON  Alt-BOC-SBAS: WAAS, ECNOS, GACAN, MSAS  Alt-BOC-SBAS: WAAS, ECNOS, GACAN, MSAS  Single Baseline (4.30 km)  Network RTK  Horizontal: 8 mm + 1 ppm Vertical: 15 mm + 0.5 ppm
Satellite signals tracking  GPS: L1, L2, L2, L5 (CA, R, C Code)  ACUMENCY (rms)*  ACUMENCY (rms)*  DGPS/RTCM  APPLICATION TO THE Parm Models (called (rest): GOVE-A, GIOVE-B; Called: EL, ESa, ESb, Al-BOC, SAAS: WAAS, ECNOS, GACAN, MSAS  DGPS/RTCM  Typically 25 cm  Single Baseline (c30 km) Horizontals 8 mm + 1 ppm  Network RTK  Horizontals 8 mm + 0.5 ppm  Post Processing (phase) Horizontals 8 mm + 0.5 ppm  Post Processing (phase) Horizontals 3 mm + 0.5 ppm  Post Processing (phase) Ho
GLONASS, EL, 22 (CA, Pramov Code); Galleco Fest); GOIVE-A; GOIVE-A; GOIVE-B; Galleco EL, ESa, ESb, ARBOC; SARS, WAS, EXOS; GAGAN, MSAS  Accuracy (Irms)  DCPS/RTCM  Single Baseline (+30 km)  Network RTK  Horizontal: 8 mm + 1 ppm  Network RTK  Post Processing (phase) State with long observations  Post Processing (phase) Report Post Processing (phase) Report Post Post Post Post Post Post Post Pos
DCPS/RTCM  Single Baseline I c 30 km)  Horizontal: 3 mm + 1 ppm  Network RTK  Horizontal: 3 mm + 0.5 ppm  Post Processing Iphase I Static with long observations  Post Processing Iphase I Static with long observations  Post Processing Iphase I Static with long observations  Post Processing Iphase I Rapid static mode  On The-Fy Initialization  Reliability'  Reliability'  Reliability'  Reliability'  Reliability'  Recording rate  User Interface  User Interface  Very Soys  On / Off key  Led Status indicator  Communication ports  Communication protocols  Real-Time data formats for data transmission  Real-Time data formats for data reception  Real-Time data formats for
Single Baseline (<30 km) Vertical: 1 5 mm + 1 ppm Network RTK Horizontal: 8 mm + 1 ppm Network RTK Horizontal: 8 mm + 1 ppm Vertical: 1 5 mm + 1 ppm Vertical: 1 5 mm + 1 ppm Vertical: 1 5 mm + 0.5 ppm Post Processing (phase) Static with long observations Post Processing (phase) Post Processing (phase) Vertical: 3 5 mm + 0.5 ppm Vertical: 3 5 mm + 0.5 ppm Vertical: 5 mm + 0.5 ppm Vertical: 5 mm + 0.5 ppm Vertical: 5 mm + 0.5 ppm  On-The-EFF printialization Reliability Reliability Reliability Better than 99,99% using Leica SmartCheck technology Time for initialization Pypically 4 sec? RTK baseline range Data recording Recording rate Up to 20 Hz User Interface Noya Leid Status indicator Satellite tracking, Bluetooth* communication and battery power Communication ports  - Combined USB / Power port with 8-pin Lemo plug - Integrated Bluetooth* port - Communication ports  - Communication protocols Real-Time data formats - For data transmission Real-Time data formats - For data reception - Recording RTKM 3 RTKM 3 .0 RTKM 3 .1, RTKM 3 .2 MSM - Fill support of RTKM 3 Transformation Message  Physical - Physical
Network RTK  Post Processing (phase) Slatic with long observations Post Processing (phase) Slatic with long observations Post Processing (phase) Repair static mode  Netrical: 5.15 mm + 0.15 ppm  Network 1.35 mm + 0.15 ppm  Network 1.35 mm + 0.5 ppm  Network 1.35 mm + 0.
Vertical: 15 mm + 0.1 ppm
Static with long observations Post Processing (phase) Post Processing (phase) Rapid static mode On-The-Fty initialization Reliability <sup>2</sup> Time for initialization Recording rate  Up to 20 Hz  Recording rate  User Interface  Keys  On / Off key  Led Status indicator Satellite tracking, Bluetooth* communication and battery power  Communication prots  Communication prots  Real-Time data formats for data transmission Real-Time data formats for data transmission Real-Time data formats For data reception Reves  Weight  1.05 kg including battery Dimension (diameter x height) Dimension (diameter x height) Dimension (diameter x height) Senior Let volve 1.06 kg including battery Dimension (diameter x height) Temperature, operating  -40° C to +65° C, compliance with ISO9022-10-08, ISO9022-11-special, Mill. STD 8106 Method 50.5. In Mill. ST
Rapid static mode  On-The-Fly initialization  Reliability'  Better than 99,99% using Leica SmartCheck technology  Time for initialization  Typically 4 sec²  RTK baseline range  up to 70 km  Data recording  Recording rate  Up to 20 Hz  User Interface  Keys  On / Off key  Led Status indicator  Communication ports  - Combined USs/ Power port with 8-pin Lemo plug  Integrated Bluetooth* port  - Spin clip on contacts for Leica SmartStation setup  Communication protocols  Real-Time data formats  for data transmission  Real-Time data formats  for data reception  Recording technical formats  Recording technical formats  Recording technical formats  Recording technical formation for the formation for th
Reliability Time for initialization Typically 4 sec² RTK baseline range Up to 70 km Data recording Recording rate Up to 20 Hz  Very Led Status indicator Communication ports Safellite tracking, Bluetooth® communication and battery power Communication ports  Communication ports Safellite tracking, Bluetooth® communication and battery power Communication ports Communication ports Safellite tracking, Bluetooth® communication and battery power Communication ports Communication ports Safellite tracking, Bluetooth® communication and battery power Communication ports Safellite tracking, Bluetooth® communication and battery power Communication ports Safellite tracking, Bluetooth® communication and battery power Safellite tracking, Bluetooth® communication and battery bower Safellite t
Time for initialization  RTK baseline range  up to 70 km  Data recording  Recording rate  Up to 20 Hz  Very  Interface  Keys  On / Off key  Led Status indicator  Communication ports  **Combined USB / Power port with 8-pin Lemo plug  **Integrated Bluetooth** port  **S-pin clip on contacts for Leica SmartStation setup  Communication protocols  Real-Time data formats for data transmission  Real-Time data formats for data reception  Real-Time data formats for data reception  Full support of RTCM 2.3, RTCM 3.0, RTCM 3.1, RTCM 3.2, RTCM 3.0, RTCM 3.1, RTCM 3.2, RTCM 3.0, RTCM 3.1, RTCM 3.2 MSM  Full support of RTCM 3.7 mansformation Message  Physical  Weight  Dimension (diameter x height)  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 I  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 ISO9022-10-08, ISO9022-11-special, MIL STD 810G Method 502.5 I, MIL STD 810G Method 501.5 I  Humidity  100%, compliance with ISO9022-30-3, OS, ISO9022-11-special, MIL STD 810G Method 502.5 I, MIL STD 810G Method 501.5 I  100%, compliance with ISO9022-30-3, OS, ISO9022-11-special, MIL STD 810G Method 502.5 I, MIL STD 810G Method 501.5 I  100%, compliance with ISO9022-30-30, ISO9022-11-special, MIL STD 810G Method 502.5 I, MIL STD 810G Method 501.5 I  100%, compliance with ISO9022-30-30, ISO9022-11-special, MIL STD 810G Method 502.5 II, MIL STD 810G Method 503.5 I and MIL STD 810G Method 503.5 I MIL STD 810G Method 503.5
RTK baseline range up to 70 km  Data recording Recording rate Up to 20 Hz  Ver Interface  Keys On / Off key  Led Status indicator Satellite tracking, Bluetooth* communication and battery power  Communication ports Communication ports integrated Bluetooth* port port with 8-pin Lemo plug - Integrated Bluetooth* port - 5-pin clip on contacts for Leica SmartStation setup  Communication protocols  Real-Time data formats for data transmission  Real-Time data formats for data reception FICM 2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1, RTCM 3.2 MSM Full support of RTCM 3 Transformation Message  Physical  Weight 1.05 kg including battery  Dimension (diameter x height) 186 mm x 89 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 I  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 and And dust Protected against blowing rain and dust  Protected against blowing rain and dust
Data recording Recording rate  Up to 20 Hz     Data recording rate   Up to 20 Hz
Recording rate  Up to 20 Hz  Interface  Keys  On / Off key  Led Satus indicator  Communication ports  - Combined USB / Power port with 8-pin Lemo plug - Integrated Bluetooth® port - S-pin clip on contacts for Leica SmartStation setup  Communication protocols  Real-Time data formats for data transmission  Real-Time data formats for data transmission  Real-Time data formats for data reception  Real-Time data formats for data reception RTCM 3  RTCM 3, RTCM 3.0, RTCM 3.1, RTCM 3.2 MSM Full support of RTCM 3 Transformation Message  Physical  Weight  Dimension (diameter x height)  Environmental specifications  Temperature, operating  -40° C to +65° C, compliance with ISO9022-10-08, ISO9022-11-special, MIL STD 810G Method 501.5 II  Humidity  100%, compliance with ISO9022-12-0-08, ISO9022-11-special, MIL STD 810G Method 501.5 II, MIL STD 810G Method 501.5 I  Humidity  100%, compliance with ISO9022-12-04 and MIL STD 810G Method 507.5 I  Sealed against water, sand and dust  Protected against blowing rain and dust
User Interface   Keys
Keys On / Off key  Led Status indicator Satellite tracking, Bluetooth® communication and battery power  Communication ports • Combined USB / Power port with 8-pin Lemo plug • Integrated Bluetooth® port • 5-pin clip on contacts for Leica SmartStation setup  Communication protocols  Real-Time data formats for data transmission  Real-Time data formats for data reception RTCM 3.1, RTCM 2.1, RTCM 3.3, RTCM 3.0, RTCM 3.1, RTCM 3.2 MSM Full support of RTCM 3 Transformation Message  Physical  Weight 1.05 kg including battery  Dimension (diameter x height) 1.86 mm x 89 mm  Environmental specifications  Temperature, operating -40° C to +65° C, compliance with ISO9022-10-08, ISO9022-11-special, MIL STD 810G Method 502.5 I, MIL STD 810G Method 501.5 II  Temperature, storage -40° C to +68° 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, ISO9022-11-special, MIL STD 810G Method 502.5 I, MIL STD 810G Method 501.5 I and MIL STD 810G Method 501.5 I MIL STD 810G Method 502.5 I, MIL STD 810G Method 501.5 I and MIL STD 810G Method 501.5 I MIL STD 810G Method 501.5 I and MIL STD 810G Method 501.5 I MIL STD 810G Method 501.5 I and MIL STD 810G Method 501.5 I MIL STD 810G Method 501.5 I MIL STD 810G Method 501.5 I and MIL STD 810G Method 501.5 I MIL STD 810G Method 501.5 I and MIL STD 810G Method 501.5 I MIL STD 810G Method 501.5 I and MIL STD 810G Method 501.5 I and MIL STD 810G Method 501.5 I MIL STD 810G Method 501.5 I and
Led Status indicator  Satellite tracking, Bluetooth* communication and battery power  Communication ports  • Combined USB / Power port with 8-pin Lemo plug • Integrated Bluetooth* port • 5-pin clip on contacts for Leica SmartStation setup  Communication protocols  Real-Time data formats for data transmission  RECM 3  RTCM 3  RTCM 2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1, RTCM 3.2 MSM Full support of RTCM 3 Transformation Message  Physical  Weight  Dimension (diameter x height)  Environmental specifications  Temperature, operating  -40° C to +65° C, compliance with ISO9022-10-08, ISO9022-11-special, MIL STD 810C Method 502.5 II, MIL STD 810G Method 501.5 II  Temperature, storage  -40° C to +80° C, compliance with ISO9022-12-04 and MIL STD 810G Method 507.5 I  Humidity  100%, compliance with ISO9022-13-06, ISO9022-12-04 and MIL STD 810G Method 507.5 I and MIL
Communication ports  • Combined USB / Power port with 8-pin Lemo plug • Integrated Bluetooth® port • 5-pin clip on contacts for Leica SmartStation setup  Communication protocols  Real-Time data formats for data transmission  Real-Time data formats for data reception A. RTCM 3.1, RT
Integrated Bluetooth® port • 5-pin clip on contacts for Leica SmartStation setup  Communication protocols  Real-Time data formats for data transmission  Real-Time data formats for data reception for RTCM 3.1, RTCM 3.3, RTCM 3.1, RTCM 3.2, MSM Fall support of RTCM 3 Transformation Message  Physical  Weight
Real-Time data formats for data transmission  Real-Time data formats for data reception  Real-Time data formats Leica proprietary formats (Leica, Leica 4G), CMR, CMR+, RTCM 3.2, MSM Fell support of RTCM 3.1, RTCM 3.1, RTCM 3.2, MSM Fell support of RTCM 3 Transformation Message  Physical  Weight  Dimension (diameter x height)  1.05 kg including battery  Dimension (diameter x height)  186 mm x 89 mm  Environmental specifications  Temperature, operating  -40° C to +65° C, compliance with ISO9022-10-08, ISO9022-11-special, 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 501.5 I  Humidity  100%, compliance with ISO9022-13-06, ISO9022-12-04 and MIL STD 810G Method 507.5 I  Physical  Physi
for data transmission  Real-Time data formats for data reception  REAL-Time data formats for data reception  REAL-Time data formats for data reception  REAL-TIME 2.1, RTCM 3.0, RTCM 3.1, RTCM 3.2 MSM Full support of RTCM 3 Transformation Message  Physical  Weight  1.05 kg including battery  Dimension (diameter x height)  186 mm x 89 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  P68 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
for data reception  RTCM 2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1, RTCM 3.2 MSM Full support of RTCM 3 Transformation Message  Physical  Weight  1.05 kg including battery  Dimension (diameter x height)  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  Pea 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
Physical  Weight 1.05 kg including battery  Dimension (diameter x height) 186 mm x 89 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  Sealed against water, sand and dust MIL STD 810G Method 512.5 I Protected against blowing rain and dust
Weight 1.05 kg including battery  Dimension (diameter x height) 186 mm x 89 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  Sealed against water, sand and dust MIL STD 810G Method 512.5 I Protected against blowing rain and dust
Dimension (diameter x height)  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  Sealed against water, sand and dust  MIL STD 810G Method 512.5 I  Protected against blowing rain and dust
Environmental specifications  Temperature, operating
Temperature, operating
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  Sealed 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
Humidity 100%, compliance with ISO9022-13-06, ISO9022-12-04 and MIL STD 810G Method 507.5 I  Sealed 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
Sealed 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 vibrations in compliance with ISO9022-36-08 and MIL STD 810G Method 514.6-Cat.24
Drops Withstands 1 m drop onto hard surface
Topple over Withstands topple over from a 2 m survey pole onto hard surface
Functional shock  No loss of lock to satellite signals when used on a pole setup and submitted to pole bumps up to 150 mm
Power management
Supply voltage Nominal 12 V DC, Range 10.5 – 28 V DC
Supply voltage Nominal 12 V DC, Range 10.5 – 28 V DC  Internal Power supply Removable & rechargable Li-Ion battery, GEB212 2.6 Ah / 7.4 V

<sup>&</sup>lt;sup>1</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 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.

\*\*May vary due to atmospheric conditions, multipath, obstructions, signal geometry and number of tracked signals.

\*\*May vary with temperature and battery age.



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