Leica Viva GNSS
GS15 receiver
Datasheet

- when it has to be right

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 interna technology to avoid breaking, losing or forgetting antenna
## Technical Specifications

### Leica GS15 GNSS Receiver

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### 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+ channels
- **Max. simultaneously 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
  - 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**:
  - DGPS / RTCM: Typically 25 cm
- **Accuracy (rms) with Real-time-Kinematic (RTK)**:
  - 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**:
  - 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%
  - Time for initialisation: Typically 4 sec
- **C/A range**:
  - Up to 70 km

### Network RTK

- **Supported RTK network solutions**: VRS, FKP, iMAX
- **Supported RTK network standards**: MAC (Master Auxiliary Concept) approved by RTCM SC 104

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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

<table>
<thead>
<tr>
<th>Weight &amp; Dimensions</th>
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<tr>
<td><strong>Weight (GS15)</strong></td>
<td>1.34 kg</td>
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<tr>
<td><strong>Weight</strong></td>
<td>3.50 kg standard RTK rover including slot RTK device, controller, batteries pole and bracket</td>
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<tr>
<td><strong>Dimension (GS15)</strong></td>
<td>196 mm x 198 mm</td>
</tr>
</tbody>
</table>

#### Environmental Specifications

| **Operating temperature** | –40° C to +65° C, compliance with ISO9022-10-08, ISO9022-11-special, MIL STD 810G Method 502.5 1, MIL STD 810G Method 501.5 1 |
| **Humidity**             | 100%, compliance with ISO9022-23-06, ISO9022-12-04 and MIL STD 810G Method 507.5 1 |
| **Proof against**        | water, sand and dust: IP65 according to IEC60529 and MIL STD 810G Method 506.5 1, MIL STD 810G Method 510.5 1, MIL STD 810G Method 512.5 1, 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 |
| **Topple over**          | withstands full over from a 2 m survey pole onto hard surfaces |

#### Power & Electrical

| **Supply voltage**       | Nominal 12 V DC |
| **Power consumption**    | Typically: 3.2 W, 270 mA |

#### Internal power supply

- Charge & removable Li-Ion battery, 2.6 Ah / 7.4 V, 2 batteries fit into receiver
- Rechargeable external NiMh battery 9 Ah / 12 V

#### Power & Electrical Time

- 10.00 h receiving RTK data with standard radio
- 9.00 h transmitting RTK data with standard radio
- 7.50 h RTK via GSM/GPRS connection

#### Memory & Data Recording

| **Memory** | 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:  |
| **Recording rate** | Up to 20 Hz |
| **Buttons** | ON / OFF button |
| **Function button** | Easy switch between Rover / Base mode |
| **Led status indicator** | Bluetooth®, position, RTK status, data logging, detailed power status |

#### Communications

| **Communication ports** | 2 x serial RS232 Lemo |
| **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 |
| **UHF antenna options** | Fully integrated, fully sealed 3.5c phone modem |
| **GSM / UMTS phone modem** | Fully integrated, fully sealed 3.5c phone modem |
| **CDMA phone modem** | Fully integrated, fully sealed CDMA phone modem |
| **GSM / UMTS / CDMA antenna options** | Internal GSM / UMTS / CDMA antenna connector (Type ON) |

#### External Data Links

| **Real-time data formats for data transmission and reception** | Leica proprietary formats (Leica, Leica 4G) |
| **Communication Protocols** | NMEA 0183 V 4.00 and Leica proprietary |

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**Memory & Data Recording**

- **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
- **Buttons**: ON / OFF button, Function button
- **Function button**: Easy switch between Rover / Base mode
- **Easy “Here” positioning functionality**
- **Led status indicator**: Bluetooth®, position, RTK status, data logging, detailed power status

**User Interface**

- **Communication ports**: 2 x serial RS232 Lemo, 1 x USB / RS232 Lemo, 1 x UMTS 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

**Communications**

- **Radio modems**: Fully integrated, fully sealed receive / transmit radios, User exchangeable device, SATTEL, Pacific Crest and TrimTalk support, 390 – 470 MHz bandwidth, Transmit power: 0.5 – 1.0 W
- **UHF antenna options**: Fully integrated, fully sealed 3.5c phone modem, 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
- **GSM / UMTS phone modem**: Fully integrated, fully sealed GSM smartphone 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 ON)
- **External Data Links**: Support of any suitable GSM / GPRS / UMTS / CDMA modem

**Real-time data formats for data transmission and reception**: Leica proprietary formats (Leica, Leica 4G)

**Communication Protocols**: 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.