Built on years of knowledge and experience, the Leica GS10 delivers the hallmarks of Leica GNSS – reliability and accuracy.

Proven GNSS technology

- 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

Work as you want to

The Leica GS10 is designed to suit any surveying task.

- IP67 protection against dust and immersion to 1 m
- Built for extreme temperatures of -40°C to +65°C

Rugged

The Leica GS10 is built for the most demanding environments.
# Technical Specifications

## Leica GS10 GNSS receiver

<table>
<thead>
<tr>
<th>Supported GNSS Systems</th>
<th>Leica GS10 Single Frequency</th>
<th>Leica GS10 Basic</th>
<th>Leica GS10 Limited</th>
<th>Leica GS10 Performance</th>
<th>Leica GS10 Professional</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPS L2</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td>GPS L5</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td>GLONASS</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
</tr>
</tbody>
</table>

## 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: ● ○ ○ ○ ● ● ● ● ●

## 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 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, E1b, 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

### Reacquisition time
< 1 sec

## GNSS Antennas

### Standard survey antennas

<table>
<thead>
<tr>
<th>Types</th>
<th>AS10</th>
<th>AS05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satellite signal tracking</td>
<td>GPS: L1, L2, L2C, L5</td>
<td>GLONASS, Galileo, Compass</td>
</tr>
<tr>
<td>Ground plane</td>
<td>Built-In Ground plane</td>
<td>Built-In Ground plane</td>
</tr>
<tr>
<td>Dimensions (diameter x height)</td>
<td>170 mm x 62 mm</td>
<td>170 mm x 62 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>0.44 kg</td>
<td>0.44 kg</td>
</tr>
<tr>
<td>Gain</td>
<td>29.5 dB</td>
<td>Typically 27 dB</td>
</tr>
<tr>
<td>Temperature operating</td>
<td>-40°C to +70°C</td>
<td></td>
</tr>
<tr>
<td>Temperature storage</td>
<td>-55°C to +85°C</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Protection against water, sand</td>
<td>IP66, IP67</td>
<td></td>
</tr>
</tbody>
</table>

### Choke-ring antennas

<table>
<thead>
<tr>
<th>Types</th>
<th>AR25</th>
<th>AT504 GG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satellite signal tracking</td>
<td>GPS: L1, L2, L5</td>
<td>GPS: L1, L2</td>
</tr>
<tr>
<td>Design</td>
<td>Dorne Margolin, JPL design</td>
<td>Dorne Margolin, JPL design</td>
</tr>
<tr>
<td>Protection radome</td>
<td>optional</td>
<td>optional</td>
</tr>
<tr>
<td>Dimensions (diameter x height)</td>
<td>380 mm x 200 mm</td>
<td>380 mm x 140 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>7.6 kg</td>
<td>4.3 kg</td>
</tr>
<tr>
<td>Gain</td>
<td>Typically 40 dB</td>
<td>Typically 27 dB</td>
</tr>
</tbody>
</table>

## Measurement Performance & Accuracy

### Accuracy (rms) Code differential with DGPS / RTCM
- DGPS / RTCM: Typically 25 cm (rms)
- Accuracy (rms) with Real-Time (RTK)
  - Standard of compliance: Compliance with ISO17123-3
  - Rapid static (phase): Horizontal: 3 mm + 0.1 ppm (rms)
  - Kinematic (phase): Horizontal: 10 mm + 1 ppm (rms)

### Accuracy (rms) with Post-Processing
- Static (phase) with long observations: Horizontal: 3 mm + 0.1 ppm (rms)
- Static and rapid static (phase): Horizontal: 5 mm + 0.5 ppm (rms) / Vertical: 10 mm + 0.5 ppm (rms)

### On the Fly (OTF) Initialization
- RTK technology: Leica SmartCheck+ technology
- Reliability of OTF initialization: Better than 99.999%
- Time for initialization: Typically 8 sec
- OTF range: up to 50 km

### Network RTK
- Network technology: Leica SmartRTK technology
- Supported RTK network solutions: VRS, FKP, IMAX
- Supported RTK network standards: IMAC (Master Auxiliary Concept) approved by RTCM SC 104
## Hardware

### Weight & Dimensions
- **Weight (GS10):** 1.20 kg
- **Weight:** 5.40 kg standard RTK backpack rover including GFU RTK device, controller, batteries, pole and bracket
- **Dimension (GS10):** 212 mm x 166 mm x 79 mm

### Environmental specifications
- **Temperature, operating:** -40° C to +65° C, compliance with ISO9022-10-08, MIL STD 810F – 502.4-I, MIL STD 810F – 501.4-I
- **Temperature, storage:** -40° C to +80° C, compliance with ISO9022-10-08, MIL STD 810F – 502.4-I, MIL STD 810F – 501.4-I
- **Humidity:** 100%, compliance with ISO9022-13-06, ISO9022-12-04 and MIL STD 810F – 507.4-I
- **Protection:** Water, sand and dust IP67 according IEC60529 and MIL STD 810F – 506.4-I, MIL STD 810F – 505.4-I and MIL STD 810F – 512.4-I
- **Vibration:** Withstands strong vibration during operating, compliance with ISO9022-36-08 and MIL STD 810F – 514.5-Cat.2
- **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
- **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, 4.4 Ah / 7.4 V, 2 batteries fit into receiver
  - **Internal power supply, operation time:**
    - 15.00 h receiving RTK data with standard radio
    - 13.00 h transmitting RTK data with standard radio
    - 14.00 h RTK via GSM / GPRS connection 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 medium:** Removable SD card: 1 GB
- **Data capacity:** 1 GB is typically sufficient for about GPS & GLONASS (8+4 satellites)
- **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:**
  - 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:** Integrated web interface functionality provides full status indicator and configuration options

## Communications
- **Communication ports:**
  - 2 x serial RS232 Lemo
  - 1 x USB / RS232 Lemo
  - 1 x 5pin Lemo external power
  - 1 x Bluetooth® port, Bluetooth® v 2.00 + EDR, class 2
  - 2 real-time output interfaces via independent ports, providing identical or different RTK / RTCM formats
- **Simultaneous data links:**
  - Up to 3 data links can be attached and used simultaneously
  - External data links:
    - **Radio modems:** Support of any suitable UHF / VHF radio with RS232 interface and operating in transparent mode
    - Satellite3AS in Leica GFU housing, fully sealed and protected, IP67
    - Pacific Crest PDS in Leica GFU housing, fully sealed and protected, IP67
  - **GSM / UMTS(HSDPA) phone modems:** Support of any suitable GSM / GPRS / UMTS(HSDPA) modem
    - Siemens MC75 in Leica GFU housing, Quad-Band 850 / 900 / 1800 / 1900 MHz fully sealed and protected, IP67
  - **CDMA phone modems:** Support of any suitable CDMA modem
    - Multitech MTMMC CDMA in Leica GFU housing, Dual-Band 800 / 900 MHz, 1xRTT, fully sealed and protected, IP67
  - **Landline phone modems:** Support of any suitable Landline phone modem
- **Communication protocols:**
  - Real-Time data formats for data transmission and reception:
    - Leica proprietary formats
  - 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 2.20 and Leica proprietary

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1. The Compass signal is not finalized, although, test signals have been tracked in a test environment. As changes in the signal structure may still occur, Leica Geosystems cannot guarantee full Compass compatibility.
2. 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.
3. Might vary due to atmospheric conditions, signal multipath, obstructions, signal geometry and number of tracked signals.
4. Might vary with temperatures, age of battery, transmit power of data link device.
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.