

# Leica iCON gps 60

## Smart positioning on any construction site



**icon**  
intelligent CONstruction

### Leica iCON gps 60 is a versatile SmartAntenna for all construction positioning tasks.

Featuring superior GNSS technology and various integrated communication options, it meets all your requirements for reliable and accurate measurements. Its intuitive display shows full status information of the instrument, simplifying operation and configuration. Leica iCON gps 60 also offers exceptional network capabilities allowing you to use RTK network services (Leica SmartNet and other networks) for highly reliable, improved GPS positions.

- Superior GNSS Technology for maximum accuracy and reliability. Features Leica SmartTrack+ and SmartCheck+ and Leica xRTK.
- Future-proof satellite tracking. Works with all existing and future satellite systems.
- SmartLink – bridges RTK communication gaps up to 10 minutes
- Multi-purpose GPS solution. Can be used as construction site GNSS Base, Rover or NetRover, in supervisor vehicle on site and entry level machine control mounted inside a machine.
- Unique communication flexibility, featuring integrated radio, modem and Bluetooth®.
- Integrated NTRIP Server and Caster for Internet based Reference Station.
- No controller required for base station set-up means you need less hardware.
- Unique flexible software licencing and feature upgrade concept. You can order packages or individual licences when you need them, investing when you need to.



- when it has to be **right**

**Leica**  
Geosystems

## Leica iCON gps 60

One instrument for many tasks



Perform many positioning tasks yourself, easily and quickly. Check grade or cut & fill, stake-out points and lines and as built checks.



Leica iCON gps 60 is the perfect mobile base station for your construction site. You don't need a controller for base station set-up. Stream corrections over the Internet without Radio.



Save time and increase your productivity monitoring the grade from your supervisor vehicle on site.



Use Leica iCON gps 60 for easy, single grade machine control applications, further increasing the value of the product and your investment.

## Technical Specifications

|  |                                     | Leica iCG60 GNSS SmartAntenna |                     |                  |                     |                         |                      |
|--|-------------------------------------|-------------------------------|---------------------|------------------|---------------------|-------------------------|----------------------|
|  |                                     | Leica iCG60 Demo              | Leica iCG60 Vehicle | Leica iCG60 Base | Leica iCG60 Network | Leica iCG60 Performance | Leica iCG60 Advanced |
| <b>Supported GNSS Systems</b>                  | GPS L2                              | •                             | ✓                   | ✓                | ✓                   | ✓                       | ✓                    |
|  | GLONASS                             | •                             | •                   | •                | •                   | ✓                       | ✓                    |
|  | GPS L5                              | •                             | •                   | •                | •                   | •                       | ✓                    |
|  | Galileo                             | •                             | •                   | •                | •                   | •                       | ✓                    |
|  | Beidou                              | •                             | •                   | •                | •                   | •                       | ✓                    |
| <b>RTK Performance</b>                         | Low accuracy RTK (50/2)             | •                             | ✓                   | •                | •                   | •                       | •                    |
|  | High accuracy RTK                   | •                             | •                   | •                | ✓                   | ✓                       | ✓                    |
|  | RTK up to 2.5 km                    | •                             | ✓                   | •                | ✓                   | ✓                       | ✓                    |
|  | RTK unlimited                       | •                             | ✓                   | •                | ✓                   | ✓                       | ✓                    |
|  | Network RTK                         | •                             | ✓                   | •                | ✓                   | ✓                       | ✓                    |
|  | SmartLink (L-band)                  | •                             | •                   | •                | •                   | •                       | ✓                    |
| <b>Positioning Update &amp; Data Recording</b> | 2 Hz positioning                    | •                             | •                   | •                | ✓                   | ✓                       | ✓                    |
|  | 10 Hz positioning                   | •                             | ✓                   | •                | •                   | ✓                       | ✓                    |
|  | 20 Hz positioning                   | •                             | •                   | •                | •                   | •                       | ✓                    |
|  | Raw Data RINEX logging              | •                             | •                   | ✓                | •                   | ✓                       | ✓                    |
|  | NMEA Output                         | •                             | •                   | •                | •                   | •                       | ✓                    |
| <b>Additional Features</b>                     | RTK Reference Station functionality | •                             | •                   | ✓                | •                   | ✓                       | ✓                    |
|  | Leica ConX                          | •                             | •                   | •                | •                   | •                       | •                    |

✓ 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>• Minimum acquisition time</li> </ul>  |
|                         | No. of channels                      | 120 channels   |
|                         | 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, L5</li> <li>• GLONASS: L1, L2</li> <li>• Galileo (Test): GIOVE-A, GIOVE-B</li> <li>• Galileo: E1, E5a, E5b, Alt-BOC</li> <li>• Beidou: B1, B2</li> </ul>  |
|                         | GNSS measurements                    | Fully independent code and phase measurements of all frequencies <ul style="list-style-type: none"> <li>• GPS: carrier phase full wave length, Code (C/A, P, C Code)</li> <li>• GLONASS: carrier phase full wave length, Code (C/A, P narrow Code)</li> <li>• Galileo: carrier phase full wave length, Code</li> <li>• Beidou: carrier phase full wave length, Code</li> </ul> |
|                         | Reacquisition time                   | < 1 sec  |

|   |  |  |
|---|--|--|
| <b>GNSS Antenna</b>                           | GNSS antenna options                                     | <ul style="list-style-type: none"> <li>Fully integrated GNSS antenna</li> <li>External GNSS antenna connector (Type TNC)</li> </ul>  |
|   | External GNSS Antenna options                            | <ul style="list-style-type: none"> <li>CGA60: GPS L1/L2//L5, GLONASS L1/L2, Galileo E1, E5a, E5b, Alt-BOC, BeiDou B1, B2</li> </ul>  |
| <b>Measurement Performance &amp; Accuracy</b> | <b>Accuracy (rms) with real-time (RTK) <sup>1)</sup></b> |  |
|   | Single baseline (< 30km)                                 | Horizontal: 8 mm + 1 ppm (rms), Vertical: 15 mm + 1 ppm (rms)  |
|   | <b>Accuracy (rms) with post processing <sup>1)</sup></b> |  |
|   | Static (phase) with long observations                    | Horizontal: 3 mm + 0.5 ppm (rms), Vertical: 3.5 mm + 0.5 ppm (rms)   |
|   | Static and rapid static (phase)                          | Horizontal: 3 mm + 1 ppm (rms), Vertical: 5 mm + 1 ppm (rms)   |
|   | <b>On-the-fly (OTF) initialisation</b>                   |  |
|   | RTK technology   | Leica SmartCheck+ technology   |
|   | Reliability of OTF initialisation                        | Better than 99,99%   |
|   | Time for initialisation                                  | Typically 4 sec <sup>2)</sup>  |
|   | <b>Network RTK</b>                                       |  |
|   | Network technology                                       | Leica SmartRTK technology  |
|   | Supported RTK network solutions                          | iMAX, VRS, FKP   |
|   | Supported RTK network standards                          | MAC (Master Auxiliary Concept) approved by RTCM SC 104   |
| <b>Hardware</b>                               | <b>Weight &amp; Dimensions</b>                           |  |
|   | Weight (iCG60)   | 1450 g (3,19 lb)   |
|   | Weight   | 3215g (7,16 lb) Standard RTK Network Rover, incl. iCG60, CC50 Controller with Bracket, Pole, Battery   |
|   | Dimensions   | 197 mm x 197 mm x 130 mm (7,76 in x 7,76 in x 5,12 in)   |
|   | <b>Environmental specifications</b>                      |  |
|   | Operating temperature                                    | -40°C to +60°C (-40 F to +140 F)   |
|   | Storage temperature                                      | -40°C to +85°C (-40 F to +185 F)   |
|   | Humidity   | 100%, compliance with ISO9022-12-04 and MIL STD 810F - 507.4-I   |
|   | Proof against: water, sand and dust                      | IP67 according IEC60529 and MIL STD 810F - 506.4-I, MIL STD 810F - 510.4-I and MIL STD 810F - 512.4-I, Protected against blowing rain and dust, Protected against temporary submersion into water (max. depth 1 m)   |
|   | Vibration  | MIL-STD-810F, Figure 514.5C-3  |
|   | Shock  | 40g - 6msec; compliance ISO 9022-31-06, No loss of lock to satellite signal when used on a pole set-up and submitted to pole bumps up to 150 mm  |
|   | Drops  | Withstands 1.2 m drop onto hard surfaces   |
|   | Topple over  | Withstands topple over from a 2m pole onto hard surfaces   |
|   | <b>Power &amp; Electrical</b>                            |  |
|   | Supply voltage   | Nominal 12 V DC, Range 9.0 – 28 V DC   |
|   | Power consumption  | Typically 6W   |
|   | Internal power supply                                    | 1x recharge & removable Li-Ion battery, 2.6 Ah, 4.4 Ah or 6.0 Ah / 7.4 V, fit into receiver  |
|   | Internal power supply, operation time                    | <ul style="list-style-type: none"> <li>5:20 h receiving RTK data with standard radio <sup>3)</sup></li> <li>4:40 h transmitting RTK data with standard radio <sup>3)</sup></li> <li>5:00 h RTK via built-in HSPA connection <sup>3)</sup></li> </ul>   |
|   | External power supply                                    | Rechargeable external NiMH battery 9 Ah / 12 V; with voltage peak protection, Fullfils EN13309   |
|   | Certifications   | Compliance to: FCC/IC Class B, CE, EN13309, RCM, ARIB STD-T66, RoHS, WEEE, ACPEIP  |
| <b>Memory &amp; Data Recording</b>            | <b>Memory</b>  |  |
|   | Internal memory  | Built-in memory, 466 MB  |
|   | Data capacity  | 466 MB is typically sufficient for about GPS & GLONASS (8+4 satellites) 3'100 h raw data logging at 15 s rate  |
|   | <b>Data recording</b>                                    |  |
|   | Type of data   | Onboard recording of RINEX data  |
| Recording rate                                | Up to 20 Hz  |  |
| <b>Interface</b>                              | Buttons  | <ul style="list-style-type: none"> <li>ON / OFF button</li> <li>6 function buttons (arrow keys - up/down/left/right, Enter, Esc)</li> </ul>  |
|   | Display  | <ul style="list-style-type: none"> <li>High resolution, 1.8" gray scale display with adjustable backlight</li> <li>Provides full receiver status on main screen (position, satellite, radio, modem, battery, Bluetooth®, telematics, memory)</li> <li>Several sub-menus for additional details</li> <li>Various configurations in sub-menus, e.g. radio channel</li> <li>Start Base Station with "Here" or type in coordinate</li> <li>Start and configure raw data logging</li> </ul> |
|   | LED status indicator                                     | 1x LED for detailed power status   |
|   | Additional functionality                                 | BasePilot functionality (stores up to different 100 base station locations and configurations for quick daily start up without user interaction)   |

|                      |  |   |
|----------------------|--|---|
| <b>Communication</b> | Communication ports  | 1x serial RS232 Lemo, PWR in, 12V PWR out<br>1x USB Host<br>1x UART serial & USB (for removable internal RTK devices)<br>1x TNC for external GNSS Antenna<br>1x Bluetooth® port, Bluetooth® v2.00+ EDR, class 2   |
|                      | No. of simultaneous data links                                 | Up to 3 real-time output interfaces via independent ports, providing identical or different RTK/RTCM formats  |
|                      | <b>Built In data links</b>                                     |   |
|                      | Radio modems   | <ul style="list-style-type: none"> <li>• Optional additional fully integrated, fully sealed receive / transmit radios</li> <li>• User exchangeable device</li> <li>• SATEL M3 TR4: 403 – 470 MHz; up to 1.0 W output power; Pac-crest 4FSK, GMSK &amp; FST, Trimble T &amp; P, Satel 3AS, 8FSK &amp; 16FSK modulation</li> <li>• Intuicom; 902-928 MHz (licence free in North America); up to 1.0 W output power</li> </ul> |
|                      | Radio modem antenna  | External antenna connector (Type QN)  |
|                      | 4G LTE / 3G HSPA / UMTS / 2G GPRS / GSM cellular modem         | <ul style="list-style-type: none"> <li>• Built-in cellular modem as default</li> <li>• User exchangeable SIM card</li> <li>• 5-Band LTE: 800 / 900 / 1800 / 2100 / 2600 MHz</li> <li>• Quad-Band UMTS / HSPA: 850 / 900 / 1900 / 2100 MHz</li> <li>• Quad-Band GSM / GPRS: 850 / 900 / 1800 / 1900 MHz</li> <li>• Up to 100 mbps downlink speed</li> </ul>  |
|                      | 4G LTE / 3G HSPA / UMTS / 2G GPRS / GSM cellular modem antenna | Integrated GSM / UMTS / HSPA / LTE antenna  |
|                      | <b>External data links</b>                                     |   |
|                      | Radio modems   | Support of any suitable serial RS232 UHF / VHF radios   |
|                      | <b>Communication protocols</b>                                 |   |
|                      | Real-time data formats for data transmission                   | Leica, Leica 4G, CMR, RTCM 3.1, RTCM 3.2 MSM 3 & 5  |
|                      | Real-time data formats for data reception                      | Leica, Leica 4G, Leica Lite, CMR, CMR+, RTCM v2.3, RTCM 3.1, RTCM 3.2 MSM 3 & 5   |
|                      | Web based protocol   | NTRIP: receiving network corrections; built-in NTRIP Server and Caster to stream local corrections to multiple RTK rovers   |

- <sup>1)</sup> Measurement precision and accuracy in position and accuracy in height are dependent upon various factors including number of satellites, geometry, 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. A full Galileo, Beidou and GPS L5 constellation will further increase measurement performance and accuracy.
- <sup>2)</sup> Might vary due to atmospheric conditions, signal multipath, obstructions, signal geometry and number of tracked signals.
- <sup>3)</sup> Might vary with temperatures, age of battery, transmit power of data link device.

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**Leica iCON CC80**  
Robust, extremely lightweight tablet with multi-touch-screen and versatile communication capabilities.



**Leica iCON robot 60**  
High-end robotic total station with superior technology and iCON onboard.



**Leica Builder**  
Intuitive, powerful and scalable manual total station series for routine construction tasks on site.