Leica iCON gps 80
Increasing productivity
Maximising uptime





The Leica iCON gps 80 GNSS machine receiver takes machine control to the next level.
The iCON gps 80 GNSS receiver in combination with CGA60 GNSS antenna increases the performance of your iCON machine control solution, allowing you to work more productively than ever before.

Increase the uptime of your dozers, excavators, drilling and dredging machines, wheel loaders, graders and pavers. Profit from fast, reliable 3D positioning and highly productive operation by a perfectly tuned machine control system.

Customer benefits

- Improved sensor integration into the machine solution for even more automatic handling, ease-of-use and speed of work
- Increased performance and productivity – all parts of the system fit together seamlessly
- CAN-bus protocol specifically designed for GNSS machine control, provides robust and reliable communication, more uptime
- Flexible communication thanks to the built-in modem and removable radios
- SmartLink Fill bridges RTK communication gaps up to 10 minutes increasing machine uptime
- Leica iCON ConX provides remote access to the machine computer for fast, perfect data transfer and support

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The most versatile, powerful GNSS machine receiver



All GNSS relevant information is available on the built-in display. No separate controller or device needed to configure the receiver.



Easy firmware update and data exchange via USB stick.



Flexible communication with built-in 4G modem, slot-in radio or external radio. Easy switch between radio and modem usage.



Clearly labelled connectors for easy system installation.

	Leica iCON gps 80 GNSS Machine Control Receiver					
	Single GNSS Entry	**Single GNSS Standard**	**Single GNSS Ultimate**	**Dual GNSS Entry Heading**	**Dual GNSS Standard Heading**	**Dual GNSS Ultimate Heading**
SUPPORTED GNSS SYSTEMS						
Multi-frequency (L2, L5, L-band)	•	✔	✔	•	✔	✔
GLONASS	•	✔	✔	•	✔	✔
Galileo	•	•	✔	•	•	✔
BeiDou	•	•	✔	•	•	✔
RTK PERFORMANCE						
RTK unlimited	•	✔	✔	•	✔	✔
Network RTK	•	✔	✔	•	✔	✔
SmartLink Fill	•	•	✔	•	•	✔
POSITION UPDATE & DATA RECORDING						
20 Hz positioning	•	✔	✔	•	✔	✔
Raw data RINEX logging	•	•	✔	•	•	✔
ADDITIONAL FEATURES						
RTK Reference Station functionality	•	•	✔	•	•	✔
NMEA out	•	•	✔	•	•	✔
Dual positioning & precise Heading	–	–	–	•	✔	✔
Open Interface License	•	•	•	•	•	•
Leica ConX	•	•	•	•	•	•

✔ Standard / • Optional / – not available

GNSS PERFORMANCE	GNSS technology	Leica patented SmartTrack+ technology: • Advanced measurement engine(s) • Jamming resistant measurements • High precision pulse aperture multipath correlator for pseudorange measurements • Excellent low elevation tracking • Minimum acquisition time; Advanced SmartHeading calculation
	Number of channels	555 channels for iCG81, 555 channels per antenna (2x) for iCG82
	Maximum simultaneous tracked satellites	Up to 60 Satellites simultaneously on two frequencies per antenna
	Satellite signals tracking	• GPS: L1, L2, L2C, L5 • GLONASS: L1, L2 • Galileo: E1, E5a, E5b, Alt-BOC • BeiDou B1, B2
	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
MEASUREMENT PERFORMANCE & ACCURACY	**Accuracy (rms) with real-time (RTK)[1)]**	
	Standard of compliance	Compliance with ISO17123-8
	Single baseline (< 30km)	Horizontal: 8 mm + 1 ppm (rms), Vertical: 15 mm + 1 ppm (rms)
	Accuracy (rms) with post processing[1)]	
	Static (phase) with long observations	Horizontal: 3 mm + 0.1 ppm (rms), Vertical: 3.5 mm + 0.4 ppm (rms)
	Static and rapid static (phase)	Horizontal: 3 mm + 1 ppm (rms), Vertical: 5 mm + 1 ppm (rms)
	Heading accuracy (rms) (iCG82 only)[1)]	
	Dynamic RTK positioning accuracy, after initialisation	Antenna separation 1 m: < 0.18°, Antenna separation 2 m: < 0.09°, Antenna separation 5m: < 0.05°
	On-the-fly (OTF) initialisation	
	RTK technology	Leica SmartCheck+ technology
	Reliability of OTF initialisation	Better than 99,99%[1)]
	Time for initalisation	Typically 4 sec[2)]
	Network RTK	
	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
HARDWARE	**Weight & Dimensions**	
	Weight	2'200 g (4.85 lbs) for iCG81, 2'250 g (4.96 lbs) for iCG82
	Dimensions	214.5 mm × 184.8 mm × 85.5 mm (8.44 × 7.27 × 3.36 in) (housing including sockets and mount wings)
	Environmental specifications	
	Operating temperature	–40 °C to +65 °C (–40 °F to +149 °F)
	Storage temperature	–40 °C to +85 °C (–40 °F to +185 °F)
	Humidity	100%, compliance with ISO9022-13-06, 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	5 – 5000 Hz, ± 1.5 mm, 0.7 g; withstands vibrations during operation on large civil construction machines. 5 – 500 Hz, 5 g, ± 15 mm (IEC 60068-2-6) MIL-STD 810G – 514.6E-1-Cat24 MIL-STD 810G – 514.6C-3-Cat4
	Shock	60 g – 6 msec; withstands vibrations during operation on large civil construction machines.
	Drops	Withstands 1.2 m drop onto hard surfaces
	Power & Electrical	
	Supply voltage	Nominal 24 V DC, Range 9 – 36 V DC
	Power consumption	iCG81, NTRIP Rover, radio excluded: 8.0 W typically, 24 V @ 333 mA iCG82, Dual GNSS, NTRIP Rover, radio excluded: 11. W typically, 24 V @ 475 mA
	External power supply	Power can be supplied by 9 V to 36 V DC power supply (machine or vehicle) via a converter cable supplied by Leica Geosystems, via either P1, CAN1 or CAN2. Alternatively by a 110V – 240 V AC to 12 V DC power supply unit supplied by Leica Geosystems, or 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
MEMORY & DATA RECORDING	**Memory**	
	Internal memory	Built-in memory, 466 MB
	Data capacity	466 MB is typically sufficient for GPS & GLONASS (12+8 satellites) approximately 130 days raw data logging at 15 s rate
	Data recording	
	Type of data	Onboard recording of RINEX data
	Recording rate	20 Hz

INTERFACE	Buttons	• ON / OFF button • 6 Function buttons (arrow keys – up/down/left/right, Enter, Esc)
	Display	High resolution, 1.8" gray scale display with adjustable backlight: • Provides full receiver status on main screen (position, satellite, radio, modem, battery, Bluetooth®, telematics, memory) • Several submenues for additional details • Various configurations in submenues, e.g. radio channel • Start Base Station with "Here" or type in coordinate • Set up Rover, coordinate system and position output (NMEA or Leica proprietary) • Start and configure raw data logging
	LED status indicator	1 × LED for error status
	Additional functionality	BasePilot functionality (stores up to different 100 base station locations and configurations for quick daily start up without user interaction)
COMMUNICATION	Communication ports	2 × CAN Power/Data, 1 × serial RS232 Lemo, PWR in, PPS out, 1 × serial RS232 Lemo, 12V PWR out (GFU support) 1 × USB Host, 1 × UART serial & USB (for removable internal RTK devices), 2 × TNC for external GNSS antenna (1 × TNC for iCG81), 1 × TNC for external radio antenna, 1 × TNC for external modem antenna, 1 × M12 Ethernet 1 × Bluetooth® port, Bluetooth® v2.00+ EDR, class 2
	Number of simultaneous data links	Up to 3 real-time output interfaces via independent ports, providing identical or different RTK/RTCM formats
	Built In data links	
	Radio modems	• Optional additional fully integrated, fully sealed receive / transmit radios • User exchangeable device • SATEL M3 TR4: 403 – 470 MHz; up to 1.0 W output power; Pac-crest 4FSK, GMSK & FST, Trimble T & P, Satel 3AS, 8FSK & 16FSK modulation • Intuicom; 902 – 928 MHz (license free in North America); up to 1.0 W output power
	Radio modem antenna	External antenna connector (Type TNC)
	4G LTE / 3G HSPA / HSPA+ / WCDMA / TD-SCDMA / UMTS / Cellular modem	• Built-in cellular modem as default • User exchangeable SIM card • 22-Band LTE: Band 1, 2, 3, 4, 5, 7, 8, 12, 13, 18, 19, 20, 21, 25, 26, 28, 29, 30, 38, 39, 40, 41 • 9-Band UMTS / HSPA / HSPA+ / WCDMA: Band 1, 2, 3, 4, 5, 6, 8, 9, 19 • TD-SCDMA: B39 • Up to 100 mbps downlink speed
	4G LTE / 3G HSPA / HSPA+ / WCDMA / TD-SCDMA / UMTS / Cellular modem antenna	External antenna connector (Type TNC)
	External data links	
	Radio modems	• Support of any suitable serial RS232 UHF / VHF radios • Satelline3AS in Leica GFU housing, fully sealed and protected, IP67 • Pacific Crest PDL in Leica GFU housing, fully sealed and protected, IP67 • Satelline TR4, Intuicom 1200DL, TFR-300L in Leica GFU housing, fully sealed and protected, IP67 • Pacific Crest ADL
	Communication protocols	
	Real-time data formats for data transmission	Leica 4G, Leica, CMR, RTCM 3.1, RTCM 3.2 MSM 3 & 5
	Real-time data formats for data reception	Leica 4G, Leica, Leica Lite, CMR, CMR+, RTCM v2.3, RTCM 3.1, RTCM 3.2 MSM 3 & 5
	Web based protocol	NTRIP: receive network corrections; built-in NTRIP Server and Caster to stream local corrections to multiple RTK rovers
	NMEA output	NMEA 0183 V 4.00 and Leica proprietary
GNSS ANTENNA	Type	CGA60
	GNSS technology	SmartTrack+
	Satellite signals tracking	• GPS: L1, L2, L2C, L5 • GLONASS: L1, L2 • Galileo: E1, E5a, E5b, Alt-BOC • BeiDou B1, B2
	Ground plane	Built-in ground plane
	Dimensions (diameter × height)	170 mm × 62 mm (6.69 × 2.44 in)
	Weight	0.44 kg (0.97 lbs)
	Gain	29 dbi
	Temperature operating	–40 °C to +70 °C (–40 °F to +158 °F)
	Temperature storage	–55 °C to +85 °C (–67 °F to +185 °F)
	Humidity	100%
	Protection against water, sand	IP66, IP67
	Drops & topple over	Withstands 1.5 m drop onto hard surfaces and survives topple over from a 2 m pole onto hard surfaces
	Vibration	10 – 10'000 Hz, ± 1.5 mm, 10 g; withstands vibrations during operation on large civil construction machines. 8 – 150 Hz, ± 15 mm, 15 g Compliance with ISO9022-36-08 and MIL-STD 810F – 514.5-Cat24
	Shock	100 g, 2 msec; withstands vibrations during operation on large civil construction machines.

[1] Measurement precision and accuracy in position, height and heading are dependent upon various factors including number of satellites, geometry, 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.

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

Highest efficiency and accuracy
For all machine control applications






Maximum performance for all your applications

The iCON gps 80 GNSS machine receiver increases the overall performance of your machine control system and ensures maximum uptime, enabling you to complete different applications faster at uncompromising quality.

Speed up with Leica ConX

Leica ConX is a web-based suite of tools that allow you to increase the efficiency of your machine control operations on site and manage your machinery fleet remotely. The Leica ConX services include fast and easy data transfer from office to site and to construction machines, remote support for the operators and basic fleet management functionality. Leica ConX seamlessly integrates with your workflow on construction projects and the Leica iCON solutions, simplifying work processes and enabling significant time and cost savings.







« Whilst I'm fairly new to the world of machine guidance, I can already see the vast benefits to both safety and production. The new iCON receiver showing a distinct increase in performance and ease of use over the previous model! »

Jim Davis, Machine Operator at Flowline

Leica xRTK for difficult GNSS conditions

Leica xRTK is Leica Geosystems technology that provides additional, reliable positions in difficult measuring environments. It provides highest availability in the most difficult conditions at a slightly lower accuracy than a standard RTK fix.

Leica SmartLink Fill for bridging RTK communication gaps

SmartLink Fill pushes boundaries by increasing centimetre position availability in areas where RTK communication links are unstable. Often UHF radio or the cell phone communication links are interrupted. The SmartLink Fill service, delivered via satellite, bridges RTK communication outages for up to 10 minutes providing uninterrupted centimetre positioning.

intelligent CONstruction

Leica Geosystems intelligent CONstruction.
Whether you construct buildings, roads, bridges or tunnels, you benefit from intelligent CONstruction. Leica iCON is more than a new product line or software package, its a complete solution that enables you to enhance your performance and increase your profitability through perfecting your construction workflow.

Understanding construction demands outstanding solutions:
- Custom-built
- Complete
- Straightforward
- High performance

When it has to be right.

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818196en – 07.18



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- when it has to be **right**

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