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Leica iCON aps 200 Series
Delivering performance





Boost machine productivity with the high performing Leica iCA202 GNSS machine receiver.

The Leica iCA202 is the ultimate GNSS machine receiver, providing high productivity for your machine control operations. In combination with the CGA100 GNSS antenna, earthmoving, road construction and other heavy construction machines can benefit from machine automation possibilities built on the features of this powerful GNSS machine receiver.

Customer benefits

- Web interface for convenient access for software configuration
- Continuous GNSS signal availability, even when the primary antenna is blocked
- Customers can easily change between 400 MHz and 900 MHz with the integrated dual frequency radio – no additional hardware required (for USA/CAN only)
- Powerful CPU
- HxGN SmartNet PPP bridges RTK connection gaps up to 10 minutes, increasing machine uptime
- Leica ConX provides remote access to the machine computer for fast, reliable data transfer and support

Leica iCA202
Undefeated productivity

Leica ConX
Efficient management of all your connected construction projects and real time exchange of job-related data.

100 Hz update rate
Increasing the amount of positions per second.

Global modem
One modem which can be used worldwide.



Multiple concurrent baselines
The primary antenna is swapped automatically in case of obstacles - more uptime due to continuous GNSS signal availability.

Web interface
Web interface allows easy access to the Leica iCA202 receiver.

Integrated dual-frequency radio*
Radio frequency can be easily changed between 400 & 900 MHz. No need for additional hardware.

*for USA/CAN only

LEICA ICA202 GNSS MACHINE CONTROL RECEIVER

	SUPPORTED GNSS SYSTEMS						RTK PERFORMANCE			POSITION UPDATE & DATA RECORDING	ADDITIONAL FEATURES				
	Multi-frequency (L2, L5, L-band)	GLONASS	Galileo	BeiDou	QZSS	SBAS	RTK unlimited	Network RTK	HxGN SmartNet PP	20 / 100 Hz positioning	NMEA out	Dual positioning & precise Heading	Open Interface License	Leica ConX	Interference mitigation
Dual GNSS Entry Heading	•	•	•	•	•	–	•	•	•	• / •	•	•	•	•	•
Dual GNSS Standard Heading	✔	✔	•	•	•	✔	✔	✔	•	✔ / •	•	✔	•	•	•
Dual GNSS Ultimate Heading	✔	✔	✔	✔	•	✔	✔	✔	•	✔ / •	✔	✔	•	•	•

✔ 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 x 2
Maximum simultaneous tracked satellites	Up to 60 Satellites simultaneously on two frequencies per antenna
Position update rate	Up to 100 Hz
Satellite signals tracking	• GPS: L1 C/A, L2P, L2C, L5 • GLONASS: L1 C/A, L2P, L2C, L3 • Galileo: E1, E5a, E5b, Alt-BOC, E6 • BeiDou B1I, B1C, B2I, B2a, B3I • QZSS: L1, L2C, L5, L6[1)] • SBAS: L1, L5[1)] (WAAS, EGNOS, MSAS, GAGAN) • L-Band: Terrastar
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[2)]
MEASUREMENT PERFORMANCE & ACCURACY	
Accuracy (rms) with real-time (RTK)[2)]	
Standard of compliance	Compliance with ISO17123-8
Single baseline (< 30km)	Horizontal: 8 mm + 1 ppm (rms), Vertical: 15 mm + 1 ppm (rms)
RTK bridging	Up to 10 min bridging of RTK outages. Horizontal: 2.5cm, Veritical: 5cm
PPP	Initial convergence to full accuracy, typically 10 min, Re-convergence < 1 min Horizontal: 2.5cm, Veritical: 5cm
Heading accuracy (rms)[2)]	
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%[2)]
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)
Dimensions	226 mm × 163 mm × 69 mm (8.90 × 6.42 × 2.72 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	IEC 60068-2-30 +25°C to +55°C > 95% RH, 6 x 24 hours
Proof against: water, sand and dust	IP66/IP68, ISO 20653
Vibration	IEC 60068-2-6; 5-500 Hz; 5 g; ±15mm; 10 cycles MIL-STD-810G, Fig.514.7E-1; 7.7grms, 90min / axis
Shock	IEC 60068-2-27 60 g / 6 ms, ± 4000 shocks (each axis)
Drops	Withstands 1.2 m drop onto hard surfaces
Power & Electrical	
Supply voltage	9 – 32 VDC (24 V Nominal) Reverse polarity, short circuit, 202 V Surge
Power consumption	Dual GNSS, NTRIP Rover, radio excluded: 11.0 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 CAN1. 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, Fulfils ISO13766-1 & ISO13766-2
Certifications	Compliance to: FCC/IC Class B, CE, ISO13766-1 & ISO13766-2, RCM, ARIB STD-T66, RoHS, WEEE, ACPEIP
PROCESSOR & MEMORY	
Processor	
Main Processor	Intel Quad Core 1.9 GHz, Industrial E3845 CPU
GPU	Intel HD Graphics
Memory Storage	32 GB, Industrial grade eMMC Flash
RAM	4 GB, 64-bit industrial DDR3L

INTERFACE	
User Interface	Web interface • Several submenus for additional details • Various configurations in submenus, e.g. radio channel • Set up Rover and coordinate system
LED status indicator	3 x status information LEDs (Power, GNSS, Internet)
COMMUNICATION	
Communication ports	3 × CAN Power/Data 1 × USB Host, 1 × serial, 2 × TNC for external GNSS antenna, 1 × TNC for external radio antenna, 2 × TNC for external modem antenna, 2 × M12 Ethernet 1 × TNC for external Bluetooth antenna, 1x TNC for external Wi-Fi® antenna
Built In data links	
Radio modems	• Optional embedded radio • Dual frequency radio[3] • SATEL TR489: 403 – 473 MHz; Pac-crest 4FSK, GMSK & FST, Trimble T & P, Satel 3AS, 8FSK & 16FSK modulation; 902 – 928 MHz (license free in North America)
Radio modem antenna	External antenna connector (Type TNC)
4G LTE / 3G HSPA / HSPA+ / WCDMA / UMTS / Cellular modem	• Built-in cellular modem as default • User exchangeable SIM card • 22-Band LTE: Band 1, 2, 3, 4, 5, 7, 8, 9, 12, 13, 18, 19, 20, 26, 28, 29, 30, 32, 41, 42, 43, 46, 48, 66 • 9-Band UMTS / HSPA / HSPA+ / WCDMA: Band 1, 2, 4, 5, 6, 8, 9, 19 • Up to 100 mbps downlink speed
4G LTE / 3G HSPA / HSPA+ / WCDMA / TD-SCDMA / UMTS / Cellular modem antenna	2x external antenna connector (Type TNC)
Wi-Fi® module	802.11 a/b/g/ac Wi-Fi®
Bluetooth®	Bluetooth v3.0 on Qualcomm CSR8510 (not running in LE mode)
External data links	
Radio modems	Support of any suitable serial RS232 UHF radios
Communication protocols	
Real-time data formats for data reception	Leica 4G, Leica, Leica Lite, CMR, CMR+, RTCM v2.3, RTCM 3.1, RTCM 3.2 MSM x
GNSS ANTENNA	
Type	CGA100
GNSS technology	SmartTrack+
Satellite signals tracking	• GPS: L1, L2, L2C, L5 • GLONASS: L1, L2, L3 • Galileo: E1, E5a, E5b, Alt-BOC, E6 • BeiDou B1, B2, B3
Ground plane	Built-in ground plane
Dimensions (diameter × height)	165 mm × 60 mm (6.50 × 2.36 in)
Weight	0.44 kg (0.97 lbs)
Gain	29 db
Temperature operating	–40 °C to +85 °C (–40 °F to +185 °F)
Temperature storage	–55 °C to +85 °C (–67 °F to +185 °F)
Humidity	IEC60068-2-30 98%r.H./25°C, 93%r.H./55°C
Protection against water, sand	IP68, IP69K
Drops & topple over	Withstands 1.5 m drop onto hard surfaces and survives topple over from a 2 m pole onto hard surfaces
Vibration	IEC 60068-2-6: 5-500 Hz, 15 g, ±15 mm MIL-STD-810G: Fig.514.6E-1 Category 24 (20-2000 Hz, 7.7 grms) withstands vibrations during operation on large civil construction machines.
Shock	IEC 60068-2-27 (special): 60 g, 6 ms IEC 60068-2-27: 100 g, 2 ms withstands vibrations during operation on large civil construction machines.

[1] QZSS L6 and SBAS L5 will be provided through future firmware upgrade.

[2] Measurement precision and accuracy in position, reacquisition and initialisation time, height and heading are dependent upon various factors including number of satellites, tracked signals, obstructions, geometry, observation time, ephemeris accuracy, atmospheric conditions, multipath etc. Figures quoted assume normal to favourable conditions. 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] Only valid for USA & Canada.

Scan to find out more about the Leica Geosystems machine control solutions!

Leica iCON. Understanding construction.

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Highest efficiency and accuracy
For all machine control applications

The Leica iCA202 GNSS machine receiver increases the overall performance of your machine control system and ensures maximum uptime, enabling you to master different applications faster at uncompromising quality. No matter which machine type you operate, the Leica iCA202 is one of the essential components of the Leica Geosystems high-end machine control solutions designed to bring your productivity to the next level.



The Leica iCON iXE3 machine control solution provides real-time cut/fill indications, allowing you to rapidly excavate to the reference design.



The Leica iCON iGD3 solution for dozers ensures that you move the amount of dirt that needs to be moved; nothing less, nothing more and with the first pass.



The Leica iCON grade can dramatically increase machine efficiency, productivity and optimise material usage on any earthmoving and fine-grading project.



The Leica iCON alpine snow management solution makes slope preparation according to a 3D reference model a walk in the snow-park!

And much more...



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; it's 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

Leica Geosystems – when it has to be right

Revolutionising the world of measurement and survey for more than 200 years, Leica Geosystems, part of Hexagon, creates complete solutions for professionals across the planet. Known for premium products and innovative solution development, professionals in a diverse mix of industries, such as aerospace and defence, safety and security, construction, and manufacturing, trust Leica Geosystems for all their geospatial needs. With precise and accurate instruments, sophisticated software, and trusted services, Leica Geosystems delivers value every day to those shaping the future of our world.

Hexagon is a global leader in digital reality solutions, combining sensor, software, and autonomous technologies. We are putting data to work to boost efficiency, productivity, quality, and safety across industrial, manufacturing, infrastructure, public sector, and mobility applications.

Our technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 21,000 employees in 50 countries and net sales of approximately 3.8bn EUR. Learn more at hexagon.com and follow us @HexagonAB.

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Leica iCON gps 70 Series Brochure



Leica iCON site Brochure



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- when it has to be **right**

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