Leica iCON gps 30

User Manual
Version 1.1
English

- when it has to be **right**

Leica Geosystems

Introduction

Purchase

Congratulations on the purchase of the Leica iCON gps 30.

This manual contains important safety directions as well as instructions for setting up the product and operating it. Refer to "1 Safety Directions" for further information.

Read carefully through the User Manual before you switch on the product.

☞

The content of this document is subject to change without prior notice. Ensure that the product is used in accordance with the latest version of this document.

Updated versions are available for download at the following Internet address:

https://myworld.leica-geosystems.com > **myDownloads**.

Product identification

The model and serial number of your product are indicated on the type plate.

Always refer to this information when you need to contact your agency or Leica Geosystems authorised service centre.

Trademarks

- Windows is a registered trademark of Microsoft Corporation in the United States and other countries

All other trademarks are the property of their respective owners.

Validity of this manual

This manual applies to the Leica iCON gps 30 GNSS instrument. Where there are differences between the various instruments they are clearly described.

Available documentation

Name	Description/Format		
Leica iCON gps 30 Quick Guide	Provides an overview of the instrument together with technical data and safety directions. Intended as a quick reference guide.	✓	✓
Leica iCON gps 30 User Manual	In order to operate the instrument to a basic level all instructions required are contained in the User Manual. Provides an overview of the instrument together with technical data and safety directions.	-	✓

Refer to the following resources for all iCON gps 30 documentation/ software:

- Leica USB documentation card
- https://myworld.leica-geosystems.com

myWorld

myWorld@Leica Geosystems (**https://myworld.leica-geosystems.com**) offers a wide range of services, information and training material.

With direct access to myWorld, you are able to access all relevant services whenever it is convenient for you.

Service	Description
myProducts	Add all products that you and your company own and explore your world of Leica Geosystems: View detailed information on your products and update your products with the latest software and keep up-to-date with the latest documentation.
myService	View the current service status and full service history of your products in Leica Geosystems service centres. Access detailed information on the services performed and download your latest calibration certificates and service reports.
mySupport	Create new support requests for your products that will be answered by your local Leica Geosystems Support Team. View the complete history of your support requests and view detailed information on each request in case you want to refer to previous support requests.
myTraining	Enhance your product knowledge with Leica Geosystems Campus - Information, Knowledge, Training. Study the latest online training material on your products and register for seminars or courses in your country.
myTrustedServices	Add your subscriptions and manage users for Leica Geosystems Trusted Services, the secure software services, that assist you to optimise your workflow and increase your efficiency.

Table of Contents

1 Safety Directions

1.1 General Introduction

Description

The following directions enable the person responsible for the product, and the person who actually uses the equipment, to anticipate and avoid operational hazards.

The person responsible for the product must ensure that all users understand these directions and adhere to them.

About warning messages

Warning messages are an essential part of the safety concept of the instrument. They appear wherever hazards or hazardous situations can occur.

Warning messages...

- make the user alert about direct and indirect hazards concerning the use of the product.
- contain general rules of behaviour.

For the users' safety, all safety instructions and safety messages shall be strictly observed and followed! Therefore, the manual must always be available to all persons performing any tasks described here.

DANGER, **WARNING**, **CAUTION** and **NOTICE** are standardised signal words for identifying levels of hazards and risks related to personal injury and property damage. For your safety, it is important to read and fully understand the following table with the different signal words and their definitions! Supplementary safety information symbols may be placed within a warning message as well as supplementary text.

Type	Description
⚠ **DANGER**	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ **WARNING**	Indicates a potentially hazardous situation or an unintended use which, if not avoided, could result in death or serious injury.
⚠ **CAUTION**	Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result in minor or moderate injury.
NOTICE	Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result in appreciable material, financial and environmental damage.
☞	Important paragraphs which must be adhered to in practice as they enable the product to be used in a technically correct and efficient manner.

1.2 Definition of Use

Intended use

- Measuring raw data using carrier phase and code signal from GNSS satellites.
- Computing with software.
- Recording measurements.
- Recording GNSS and point related data.
- Carrying out measurement tasks using various GNSS measuring techniques.
- Data communication with external appliances.

Reasonably foreseeable misuse

- Use of the product without instruction.
- Use outside of the intended use and limits.
- Disabling safety systems.
- Removal of hazard notices.
- Opening the product using tools, for example screwdriver, unless this is permitted for certain functions.
- Modification or conversion of the product.
- Use after misappropriation.
- Use of products with recognisable damage or defects.
- Use with accessories from other manufacturers without the prior explicit approval of Leica Geosystems.
- Inadequate safeguards at the working site.
- Controlling of machines, moving objects or similar monitoring application without additional control and safety installations.

1.3 Limits of Use

Environment

Suitable for use in an atmosphere appropriate for permanent human habitation: not suitable for use in aggressive or explosive environments.

⚠WARNING

Working in hazardous areas, or close to electrical installations or similar situations

Life Risk.

Precautions:

- ▸ Local safety authorities and safety experts must be contacted by the person responsible for the product before working in such conditions.

☞ The following advice is only valid for battery charger, power adapter and car adapter.

Environment

Suitable for use in dry environments only and not under adverse conditions.

1.4 Responsibilities

Manufacturer of the product

Leica Geosystems AG, CH-9435 Heerbrugg, hereinafter referred to as Leica Geosystems, is responsible for supplying the product, including the User Manual and original accessories, in a safe condition.

Person responsible for the product

The person responsible for the product has the following duties:

- To understand the safety instructions on the product and the instructions in the User Manual.
- To ensure that it is used in accordance with the instructions.
- To be familiar with local regulations relating to safety and accident prevention.
- To inform Leica Geosystems immediately if the product and the application becomes unsafe.
- To ensure that the national laws, regulations and conditions for the operation of the product are respected.
- To ensure that the radio modem is not operated without the permission of the local authorities on frequencies and/or output power levels other than those specifically reserved and intended for use without a specific permit. The internal and external radio modems have been designed to operate on frequency ranges and output power ranges, the exact use of which differs from one region and/or country to another.

1.5 Hazards of Use

⚠ DANGER

Risk of electrocution

Because of the risk of electrocution, it is dangerous to use poles, levelling staffs and extensions in the vicinity of electrical installations such as power cables or electrical railways.

Precautions:

- ▸ Keep at a safe distance from electrical installations. If it is essential to work in this environment, first contact the safety authorities responsible for the electrical installations and follow their instructions.

⚠ WARNING

Lightning strike

If the product is used with accessories, for example masts, staffs, poles, you may increase the risk of being struck by lightning.

Precautions:

- ▸ Do not use the product in a thunderstorm.

⚠ WARNING

Distraction/loss of attention

During dynamic applications, for example stakeout procedures, there is a danger of accidents occurring if the user does not pay attention to the environmental conditions around, for example obstacles, excavations or traffic.

Precautions:

- ▸ The person responsible for the product must make all users fully aware of the existing dangers.

⚠WARNING

Inadequate securing of the working site

This can lead to dangerous situations, for example in traffic, on building sites and at industrial installations.

Precautions:

- ▸ Always ensure that the working site is adequately secured.
- ▸ Adhere to the regulations governing safety, accident prevention and road traffic.

⚠WARNING

Incorrect fastening of the external antenna

Incorrect fastening of the external antenna to vehicles or transporters poses the risk of the equipment being broken by mechanical influence, vibration or airstream. This may result in accident and physical injury.

Precautions:

- ▸ Attach the external antenna professionally. The external antenna must be secured additionally, for example by use of a safety cord. Ensure that the mounting device is correctly mounted and able to carry the weight of the external antenna (>1 kg) safely.

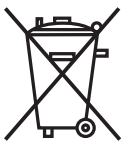
⚠WARNING

Improper disposal

If the product is improperly disposed of, the following can happen:

- If polymer parts are burnt, poisonous gases are produced which may impair health.
- If batteries are damaged or are heated strongly, they can explode and cause poisoning, burning, corrosion or environmental contamination.
- By disposing of the product irresponsibly you may enable unauthorised persons to use it in contravention of the regulations, exposing themselves and third parties to the risk of severe injury and rendering the environment liable to contamination.

Precautions:

- ▸ 

  The product must not be disposed with household waste. Dispose of the product appropriately in accordance with the national regulations in force in your country. Always prevent access to the product by unauthorised personnel.

  Product-specific treatment and waste management information can be received from your Leica Geosystems distributor.

⚠WARNING

Improperly repaired equipment

Risk of injuries to users and equipment destruction due to lack of repair knowledge.

Precautions:

- ▸ Only authorised Leica Geosystems Service Centres are entitled to repair these products.

⚠CAUTION

Not properly secured accessories

If the accessories used with the product are not properly secured and the product is subjected to mechanical shock, for example blows or falling, the product may be damaged or people can sustain injury.

Precautions:

- When setting up the product, make sure that the accessories are correctly adapted, fitted, secured, and locked in position.
- Avoid subjecting the product to mechanical stress.

⚠WARNING

Inappropriate mechanical influences to batteries

During the transport, shipping or disposal of batteries it is possible for inappropriate mechanical influences to constitute a fire hazard.

Precautions:

- Before shipping the product or disposing it, discharge the batteries by the product until they are flat.
- When transporting or shipping batteries, the person in charge of the product must ensure that the applicable national and international rules and regulations are observed.
- Before transportation or shipping, contact your local passenger or freight transport company.

⚠WARNING

Exposure of batteries to high mechanical stress, high ambient temperatures or immersion into fluids

This can cause leakage, fire or explosion of the batteries.

Precautions:

- Protect the batteries from mechanical influences and high ambient temperatures. Do not drop or immerse batteries into fluids.

⚠WARNING

Short circuit of battery terminals

If battery terminals are short circuited e.g. by coming in contact with jewellery, keys, metallised paper or other metals, the battery can overheat and cause injury or fire, for example by storing or transporting in pockets.

Precautions:

- Make sure that the battery terminals do not come into contact with metallic objects.

⚠WARNING

Battery pack of the signal transmitter may get hot after prolonged use.

Risk of burning injuries.

Precautions:

- ▸ Avoid touching the hot battery pack.
- ▸ Allow the battery pack to cool down before removing it.

For the AC/DC power supply and the battery charger:

⚠WARNING

Electric shock due to use under wet and severe conditions

If unit becomes wet it may cause you to receive an electric shock.

Precautions:

- ▸ If the product becomes humid, it must not be used!
- ▸ Use the product only in dry environments, for example in buildings or vehicles.

- ▸ Protect the product against humidity.

For the AC/DC power supply and the battery charger:

⚠WARNING

Unauthorised opening of the product

Either of the following actions may cause you to receive an electric shock:

- Touching live components
- Using the product after incorrect attempts were made to carry out repairs.

Precautions:

- ▸ Do not open the product!
- ▸ Only Leica Geosystems authorised service centres are entitled to repair these products.

1.6 Electromagnetic Compatibility (EMC)

Description

The term Electromagnetic Compatibility is taken to mean the capability of the product to function smoothly in an environment where electromagnetic radiation and electrostatic discharges are present, and without causing electromagnetic disturbances to other equipment.

⚠WARNING

Electromagnetic radiation

Electromagnetic radiation can cause disturbances in other equipment.

Precautions:

- ▸ Although the product meets the strict regulations and standards which are in force in this respect, Leica Geosystems cannot completely exclude the possibility that other equipment may be disturbed.

⚠CAUTION

Use of the product with accessories from other manufacturers. For example field computers, personal computers or other electronic equipment, non-standard cables or external batteries

This may cause disturbances in other equipment.

Precautions:

- Use only the equipment and accessories recommended by Leica Geosystems.
- When combined with the product, they meet the strict requirements stipulated by the guidelines and standards.
- When using computers, two-way radios or other electronic equipment, pay attention to the information about electromagnetic compatibility provided by the manufacturer.

⚠CAUTION

Intense electromagnetic radiation. For example, near radio transmitters, transponders, two-way radios or diesel generators

Although the product meets the strict regulations and standards which are in force in this respect, Leica Geosystems cannot completely exclude the possibility that function of the product may be disturbed in such an electromagnetic environment.

Precautions:

- Check the plausibility of results obtained under these conditions.

⚠CAUTION

Electromagnetic radiation due to improper connection of cables

If the product is operated with connecting cables attached at only one of their two ends, for example external supply cables, interface cables, the permitted level of electromagnetic radiation may be exceeded and the correct functioning of other products may be impaired.

Precautions:

- While the product is in use, connecting cables, for example product to external battery, product to computer, must be connected at both ends.

Radios, digital cellular phones or products with Bluetooth

⚠WARNING

Use of product with radio or digital cellular phone devices

Electromagnetic fields can cause disturbances in other equipment, in installations, in medical devices, for example pacemakers or hearing aids and in aircrafts. Electromagnetic fields can also affect humans and animals.

Precautions:

- Although the product meets the strict regulations and standards which are in force in this respect, Leica Geosystems cannot completely exclude the possibility that other equipment can be disturbed or that humans or animals can be affected.
- Do not operate the product with radio or digital cellular phone devices in the vicinity of filling stations or chemical installations, or in other areas where an explosion hazard exists.
- Do not operate the product with radio or digital cellular phone devices near to medical equipment.
- Do not operate the product with radio or digital cellular phone devices in aircrafts.
- Do not operate the product with radio or digital cellular phone devices for long periods with the product immediately next to your body.

☞ This warning also applies when using products with Bluetooth.

1.7 FCC Statement, Applicable in U.S.

☞ The greyed paragraph below is only applicable for products without radio.

⚠WARNING

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

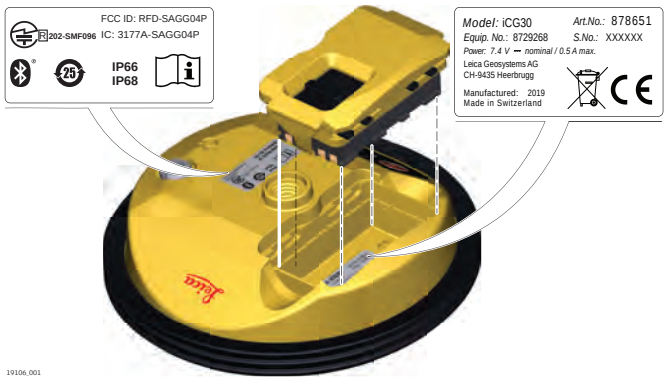
If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

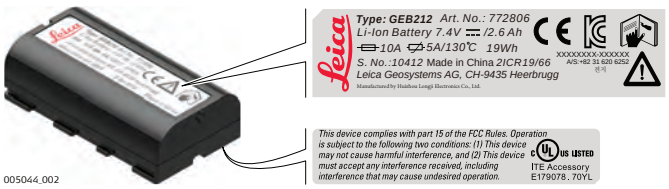
⚠CAUTION

Changes or modifications not expressly approved by Leica Geosystems for compliance could void the user's authority to operate the equipment.

Labelling iCON gps 30



Labelling internal battery GEB212



1.8 ISED Statements (EN/FR), Applicable in Canada

⚠WARNING

This Class (B) digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe (B) est conforme à la norme NMB-003 du Canada.

Canada Compliance Statement

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Canada Déclaration de Conformité

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

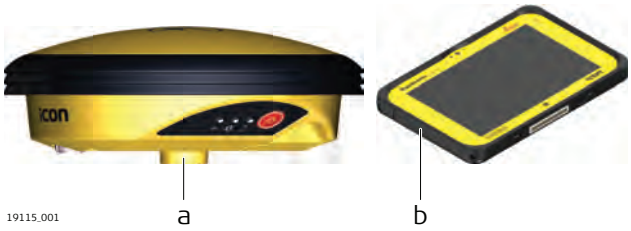
⚠CAUTION

Changes or modifications not expressly approved by Leica Geosystems for compliance could void the user's authority to operate the equipment.

2 Description of the System

2.1 Overview

General



a Antenna iCON iCG30
b CC70/CC80 Field Controller

2.2 System Components

Main components

The iCON gps 30 represents the so called instrument.

Component	Description
Integrated antenna	Receiving signals from a GNSS (Global Navigation Satellite System).
Bluetooth	To wireless pair with iCON field controller
Battery	The battery compartment holds the GEB212 battery for power supply.
LEDs	Indication of power, Bluetooth and signal reception.
LEMO-1 connector	Serial by RS232 or USB communication.
5/8" Whitworth thread	Mounting the instrument for observation.

Interface

a Lemo connector
b 5/8" Whitworth thread, for instrument mounting
c Tracking LED
d Bluetooth LED
e Power LED
f ON/OFF key
g Battery compartment

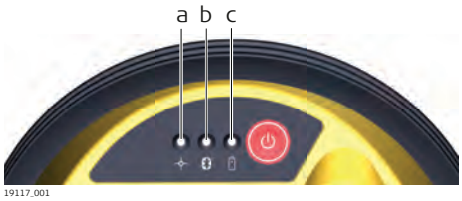
☞ Do not open the instrument or remove any connector as this action impairs the protection against water, dust and sand. Open the instrument for battery handling without exception in dry and clean conditions only.

LED indicators

Description

The iCON gps 30 instrument has **L**ight **E**mitting **D**iode indicators. They indicate the basic instrument status.

Diagram



a Tracking LED (TRK)
b Bluetooth LED (BT)
c Power LED (PWR)

Description of the LEDs

IF the	is	THEN
TRK LED	off	No satellites are tracked.
	green flashing	Fewer than four satellites are tracked, a position is not yet available.
	green	Enough satellites are tracked to compute a position.
	red	iCON gps 30 instrument is initialising.
BT LED	green	Bluetooth is in data mode and ready for connecting.
	blue	Bluetooth has connected.
	blue flashing	Data is being transferred.
iCON gps 30 PWR LED	off	Power is off.
	green	Power is 100% - 20%.
	red	Power is 20% - 5%.
	red flashing	Power is low (<5%). The remaining time for which enough power is available depends on the type of measurement, the temperature and the age of the battery.

2.3 Power Concept

General

Use the batteries, chargers and accessories recommended by Leica Geosystems to ensure the correct functionality of the instrument.

Power options

Power for the instrument can be supplied internally only.

Internal power supply: One battery (GEB212) fits into the instrument.

On/Off behaviour

- On: The instrument turns on as soon as the power supply is connected and the power key is pressed.
- Off: To turn off the instrument push either the power key or disconnect the power supply.

Total discharge

If an instrument connected to a low powered external battery continues to operate, total discharge of the battery can occur.

2.4 Container Contents

Container for iCON gps 30 instrument and accessories

a Antenna iCON gps 30
b USB flash drive
c Manual and USB documentation card
d CC70/CC80 Field Controller
e Extra battery for CC70/CC80 Field Controller*
f GEB212 battery

* Optional accessory

2.5 Accessories

Description

Extra equipment such as cables and universal pole holders are listed in the setup sections. Any further description of accessories is not part of this manual.

Refer to the Leica iCON gps 30 Equipment List.

3 Operation

3.1 Guidelines for Correct Results with GNSS Surveys

Undisturbed satellite signal reception

Successful GNSS measurements require undisturbed satellite signal reception. For kinematic use, be sure to select measurement positions with best satellite reception possible. Use the instrument in location which is free of obstructions such as trees, buildings or mountains for best measurement results.

Centred instrument

Centre the instrument precisely over the target positions.

3.2 Batteries

3.2.1 Operating Principles

First-time use/ charging batteries

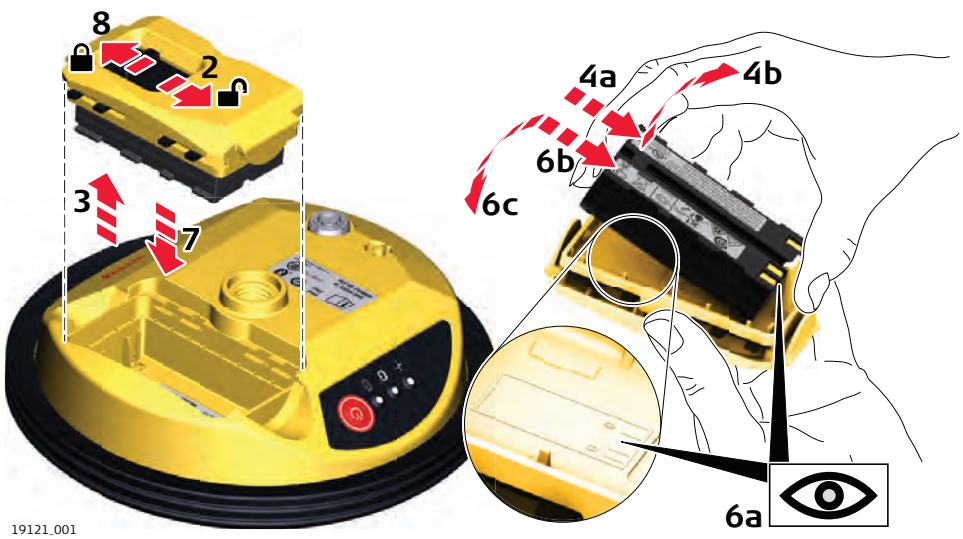
- The battery must be charged before using it for the first time because it is delivered with an energy content as low as possible.
- The permissible temperature range for charging is from 0 °C to +40 °C/+32 °F to +104 °F. For optimal charging, we recommend charging the batteries at a low ambient temperature of +10 °C to +20 °C/+50 °F to +68 °F if possible.
- It is normal for the battery to become warm during charging. Using the chargers recommended by Leica Geosystems, it is not possible to charge the battery once the temperature is too high.
- For new batteries or batteries that have been stored for a long time (> three months), it is effectual to make only one charge/discharge cycle.
- For Li-Ion batteries, a single discharging and charging cycle is sufficient. We recommend carrying out the process when the battery capacity indicated on the charger or on a Leica Geosystems product deviates significantly from the actual battery capacity available.

Operation/ discharging

- The batteries can be operated from −20 °C to +55 °C/−4 °F to +131 °F.
- Low operating temperatures reduce the capacity that can be drawn; high operating temperatures reduce the service life of the battery.

3.2.2 Changing the Battery

Insert and remove the battery on the iCON gps 30 step-by-step



1.	Turn iCON gps 30 over to gain access to the battery compartment.
2.	Open the battery compartment by pushing the slide fastener in the direction of the arrow with the open-lock symbol.
3.	Pull out the battery housing. The battery is attached to the housing.
4.	Hold the battery housing and pull the battery from the battery housing.
5.	A polarity of the battery is displayed inside the battery housing. This is a visual aid to assist in placing the battery correctly.
6.	Place the battery onto the battery housing, ensuring that the contacts are facing outward. Click the battery into position.
7.	Place the battery housing with the inserted battery back into the battery compartment of the instrument.
8.	Close the battery compartment by pushing the slide fastener in the direction of the arrow with the close-lock symbol.

3.3 Equipment Setup as a Real-Time Rover

Use

The equipment setup is used for real-time rover with extended periods of use in the field.

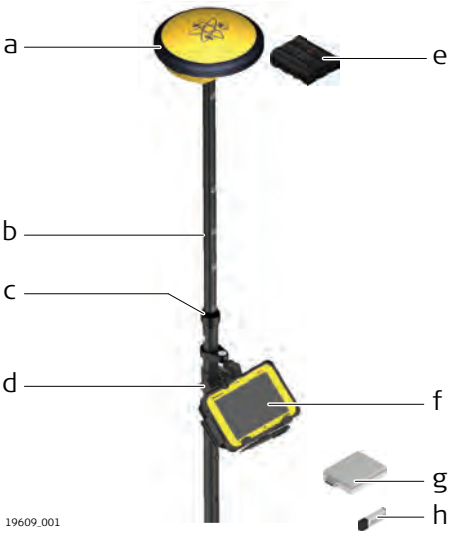
Description

Connections are made to the GNSS iCG30 antenna and field controller. The field controller is fixed to the pole with the GHT63. Connection between the iCON gps 30 instrument and the field controller is made through Bluetooth.

☞

- The antenna is mounted directly using screw fitting.
- Carbon fibre poles are used. They can be replaced with their aluminium equivalent without any change to these instructions.

Real-time rover setup with iCON gps 30



a iCON gps 30 instrument
b Pole
c Pole clamp
d Holder for Field Controller
e Battery GEB212
f CC70/CC80 Field Controller
g Battery for Field Controller
h USB data storage device

☞

Cellular modem available on the CC70/CC80 Field controller.

Real-time rover setup step-by-step

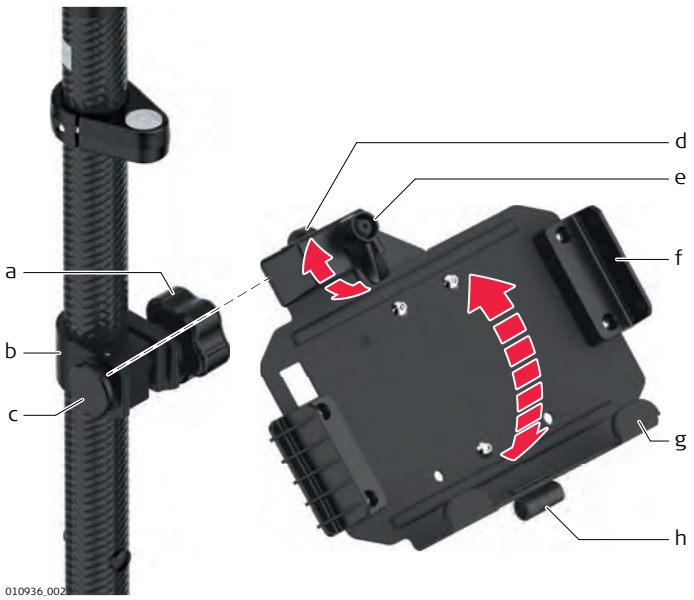
Setting up the Equipment

1.	Insert the battery into the iCON gps 30 Smart Antenna.

2.	Screw iCON gps 30 Smart Antenna onto the top of the telescopic pole.
3.	Ensure that the compression lock is not clamped.
4.	Extend the telescopic pole and ensure that the snap-lock clicks into its position. The snap-lock ensures that there is no slipping of the telescopic pole.
5.	Clamp the compression lock. The compression lock maintains straightness.
6.	Fix the holder to the clamp with the tightening screw. Before tightening, ensure that the holder is at a comfortable working height and angle. It can be achieved by sliding the clamp along the pole and rotating the holder about the clamp. Tighten the tightening screw.
7.	Insert the battery into the field controller.
8.	Clip the field controller onto the holder and lock into position.
9.	Turn on the antenna and the controller.
10.	Run the data collection or stakeout application of the iCON field software
☞	Refer to the Leica iCON Field software manual for further information.

3.4 Holder and Clamp for Field Controller

Holder for iCON CC70/ CC80



Clamp

a	Tightening screw
b	Pole clamp
c	Clamping bolt

Holder

d	Mounting arm
e	Locking lever
f	Mounting brackets (side)
g	Mounting brackets (bottom)
h	Holder for stylus

4 Care and Transport

4.1 Transport

Transport in a road vehicle

Never carry the product loose in a road vehicle, as it can be affected by shock and vibration. Always carry the product in its container and secure it.

For products for which no container is available use the original packaging or its equivalent.

Transport in the field

When transporting the equipment in the field, always make sure that you

- either carry the product in its original container,
- or carry the tripod with its legs splayed across your shoulder, keeping the attached product upright.

Shipping

When transporting the product by rail, air or sea, always use the complete original Leica Geosystems packaging, container and cardboard box, or its equivalent, to protect against shock and vibration.

Shipping, transport of batteries

When transporting or shipping batteries, the person responsible for the product must ensure that the applicable national and international rules and regulations are observed. Before transportation or shipping, contact your local passenger or freight transport company.

4.2 Storage

Product

Respect the temperature limits when storing the equipment, particularly in summer if the equipment is inside a vehicle. Refer to "5 Technical Data" for information about temperature limits.

Li-Ion batteries

- Refer to "5 Technical Data" for information about storage temperature range.
- Remove batteries from the product and the charger before storing.
- After storage recharge batteries before using.
- Protect batteries from damp and wetness. Wet or damp batteries must be dried before storing or use.
- A storage temperature range of 0 °C to +30 °C / +32 °F to +86 °F in a dry environment is recommended to minimize self-discharging of the battery.
- At the recommended storage temperature range, batteries containing a 40% to 50% charge can be stored for up to one year. After this storage period the batteries must be recharged.

4.3 Cleaning and Drying

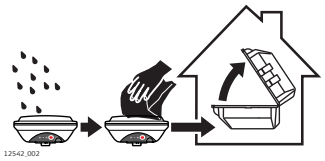
Product and accessories

- Use only a clean, soft, lint-free cloth for cleaning. If necessary, moisten the cloth with water or pure alcohol. Do not use other liquids; these may attack the polymer components.

Damp products

Dry the product, the container, the foam inserts and the accessories at a temperature not greater than 40 °C/104 °F and clean them. Remove the battery

cover and dry the battery compartment. Do not repack until everything is dry. Always close the container when using in the field.



Cables and plugs

Keep plugs clean and dry. Blow away any dirt lodged in the plugs of the connecting cables.

5 Technical Data

5.1 Tracking Characteristics iCON gps 30

Satellite reception

Multi-frequency

Instrument channels

☞ Depending on the satellite systems and signals configured, a maximum number of 320 channels is allocated.

Supported signals

System	Signal
GPS	L1 C/A, L2P, L2C, L5
GLONASS	L1, L2
Galileo	E1, E5a, E5b, AltBOC, E6*
BeiDou	B1, B2, B3*

* Believe to comply, but subject to availability of BeiDou ICD and Galileo commercial service definition. BeiDou B3 and Galileo E6 will be provided through future firmware upgrade.

Initialisation time (typical)

Cold start [s]	Warm start [s]
< 40	< 30

Signal reacquisition time (typical)

< 1 s

5.2 Accuracy

☞

Accuracy is dependent upon various factors including the number of satellites tracked, satellite geometry, observation time, ephemeris accuracy, ionospheric disturbance, multipath and resolved ambiguities.

The following accuracies, given as **r**oot **m**ean **s**quare, are based on real-time measurements.

The use of multiple GNSS systems can increase accuracy by up to 30% relative to GPS only.

Horizontal real-time accuracy

Type	Accuracy
RTK, Multi-frequency	< 1 cm cm + 1 ppm*

* Measurement precision, accuracy and reliability depend upon various factors including number of available satellites, geometry proximity to GNSS ground reference station, multipath effects or ionospheric conditions.

Vertical real-time accuracy

Type	Accuracy
RTK, Multi-frequency	< 2 cm + 1 ppm*

* Measurement precision, accuracy and reliability depend upon various factors including number of available satellites, geometry proximity to base station, multipath effects or ionospheric conditions.

5.3 Technical Data

Dimensions

Height:	0.071 m
Diameter:	0.186 m

Weight

0.8 kg including internal battery

Connector

LEMO-1:	female, 8 pin

Mounting

5/8" Whitworth

Power

Power consumption:	2.0 W typically

Internal battery

Type:	Li-Ion
Voltage:	7.4 V
Capacity:	GEB212 - 2.6 Ah
Typical operating time*:	GPS only - 10 h RTK (GPS and GLONASS) - 7.5 h

* May vary with temperature, battery age, usage or available GNSS options.

Bluetooth

Type:	Bluetooth 4.1

GNSS antenna

Type	**iCON gps 30**
Frequency For Frequency, refer to the "Frequency band" in chapter "5.4 Conformity to National Regulations"	
Gain (LNA)	Typically 28 dB
Noise Figure	Typically < 2 dB

Environmental specifications

Type	**Operating temperature [°C]**	**Storage temperature [°C]**
Instrument	–40 to +65 Bluetooth: –30 to +65	–40 to +80
GEB212	–20 to +55	–40 to +70

External influences	**Protection**
Water, dust and sand	IP66 and IP68 (IEC60529) Protected against powerful water jets Protected against continuous immersion in water Tested for 2 hours in 1.40 m depth Dust tight

External influences	Protection
Humidity	Up to 95% Periodically drying out the instrument effectively counteracts the effects of condensation.

Serial ports

Description	Default setting
Baud rates 4800–230400 baud, without RTS/CTS	115200/N/8/1/N

5.4 Conformity to National Regulations

Conformity to national regulations

- FCC Part 15 (applicable in US)
- Hereby, Leica Geosystems AG, declares that the radio equipment type iCON gps 30 is in compliance with Directive 2014/53/EU and other applicable European Directives. The full text of the EU declaration of conformity may be consulted at http://www.leica-geosystems.com/ce.

  CE Class 1 equipment according European Directive 2014/53/EU (RED) can be placed on the market and be put into service without restrictions in any EEA Member state.
- The conformity for countries with other national regulations not covered by the FCC part 15 or European directive 2014/53/EU has to be approved prior to use and operation.
- Japanese Radio Law Compliance.
  - This device is granted pursuant to the Japanese Radio Law (電波法).
  - This device should not be modified (otherwise the granted designation number will become invalid).

Frequency band

Type	Frequency band [MHz]
iCON gps 30	GPS L1: 1575.42 GPS L2: 1227.60 GPS L5: 1176.45 GLONASS L1: 1602.5625-1611.5 GLONASS L2: 1246.4375-1254.3 Galileo E1: 1575.42 Galileo E5a: 1176.45 Galileo E5b: 1207.14 Galileo E6: 1191.795 BeiDou B1: 1561.098 BeiDou B2: 1207.14
Bluetooth	2402...2480

Output power

Type	Output power [mW]
GNSS	Receive only
Bluetooth	max. 10 (Class 1)

Antenna

Type	Antenna	Gain [dBi]	Connector	Frequency band [MHz]
GNSS	Internal GNSS antenna element (receive only)	-	-	-
Bluetooth	Internal Microstrip antenna	1.0	-	-

5.4.1 Dangerous Goods Regulations

Dangerous Goods Regulations

Many products of Leica Geosystems are powered by Lithium batteries.

Lithium batteries can be dangerous under certain conditions and can pose a safety hazard. In certain conditions, Lithium batteries can overheat and ignite.

☞ When carrying or shipping your Leica product with Lithium batteries onboard a commercial aircraft, you must do so in accordance with the **IATA Dangerous Goods Regulations**.

☞ Leica Geosystems has developed **Guidelines** on "How to carry Leica products" and "How to ship Leica products" with Lithium batteries. Before any transportation of a Leica product, we ask you to consult these guidelines on our web page (http://www.leica-geosystems.com/dgr) to ensure that you are in accordance with the IATA Dangerous Goods Regulations and that the Leica products can be transported correctly.

☞ Damaged or defective batteries are prohibited from being carried or transported onboard any aircraft. Therefore, ensure that the condition of any battery is safe for transportation.

6 Software Licence Agreement

Software Licence Agreement

This product contains software that is preinstalled on the product, or that is supplied to you on a data carrier medium, or that can be downloaded by you online according to prior authorisation from Leica Geosystems. Such software is protected by copyright and other laws and its use is defined and regulated by the Leica Geosystems Software Licence Agreement, which covers aspects such as, but not limited to, Scope of the Licence, Warranty, Intellectual Property Rights, Limitation of Liability, Exclusion of other Assurances, Governing Law and Place of Jurisdiction. Please make sure, that at any time you fully comply with the terms and conditions of the Leica Geosystems Software Licence Agreement.

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You must not install or use the software unless you have read and accepted the terms and conditions of the Leica Geosystems Software Licence Agreement. Installation or use of the software or any part thereof, is deemed to be an acceptance of all the terms and conditions of such Licence Agreement. If you do not agree to all or some of the terms of such Licence Agreement, you must not download, install or use the software and you must return the unused software together with its accompanying documentation and the purchase receipt to the distributor from whom you purchased the product within ten (10) days of purchase to obtain a full refund of the purchase price.

Appendix A Firmware Upgrade

Upgrading the firmware for the iCON gps 30

☞ Upgrading the firmware takes some time. Do not interrupt the power of the device during firmware upgrade! Ensure that the battery is at least 75 % full before beginning the upgrade.

☞ iCON gps 30 firmware can only be uploaded from a Windows computer or laptop.

1.	Download the most recent iCON gps 30 firmware from https://myworld.leica-geosystems.com.
2.	Connect the iCON gps 30 to your computer by Bluetooth.
3.	Use Leica iCON CC70/CC80 to upgrade the latest firmware version. Refer to the corresponding software documentation on how to connect the instrument to your device and how to use Leica iCON Field software.

Appendix B Pin Assignments and Sockets

Description

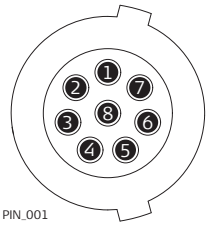
Some applications require knowledge of the pin assignments for the instrument ports.

In this chapter, the pin assignments and sockets for the instrument ports are explained.

Ports at the instrument underside

a Lemo port (USB and serial)

Pin assignments for 8 pin LEMO-1



Pin	Signal Name	Function	Direction
1	USB_D+	USB data line	In or out
2	USB_D–	USB data line	In or out
3	GND	Signal ground	-
4	RxD	RS232, receive data	In
5	TxD	RS232, transmit data	Out
6	NC	Not connected	-
7	PWR	Power input, 10.5 V–28 V	In
8	AUX_ON	RS232, manual PWR switch	In

Sockets

8 pin LEMO-1:	LEMO-1, 8 pin, LEMO EGI.1B.308.CLN

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- when it has to be **right**

Leica Geosystems