



User Manual Version 0.9 English



- when it has to be **right** 

# Introduction

Purchase	Congratulations on the	purchase of the Leica CS30.		
ĺĺ		nportant safety directions as well as ins and operating it. Refer to 1 Safety Direc		
	Read carefully through	the User Manual before you switch on t	the prod	luct.
		cument is subject to change without prid d in accordance with the latest version of		
	•	vailable for download at the following Ir -geosystems.com > myDownloads.	nternet a	address:
Product identification	The model and serial n	umber of your product are indicated on	the type	e plate.
	Always refer to this info Leica Geosystems auth	ormation when you need to contact you orised service centre.	ır agenc	-
Trademarks	<ul> <li>United States and</li> <li>SD Logo is a trader</li> <li>Bluetooth<sup>®</sup> is a reg</li> </ul>	stered trademark of Microsoft Corporati other countries mark of SD-3C, LLC. ;istered trademark of Bluetooth SIG, Inc. e the property of their respective owne		IE
– Validity of this manual	This manual applies to ous models are marked	the CS30 field controller. Differences be I and described.	tween t	:he vari-
 Available documentation	Name	Description/Format		
	CS30 Quick Guide	Provides an overview of the product together with technical data and safety directions. Intended as a quick reference guide.	✓	<b>√</b>
	CS30 User Manual	All instructions required in order to operate the product to a basic level are contained in the User Manual. Provides an overview of the product together with technical data and safety directions.	-	✓
	Name	Description/Format		
	Leica Captivate Technical Reference Manual	Overall comprehensive guide to the product and apps. Included are detailed descriptions of special soft- ware/hardware settings and soft- ware/hardware functions intended for technical specialists.	-	✓

#### Refer to the following resources for all CS30 documentation/software:

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

Leica Geosystems address book
On the last page of this manual, you can find the address of Leica Geosystems headquarters. For a list of regional contacts, please visit http://leica-geosystems.com/contact-us/sales\_support.

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 his- tory of your products in Leica Geosystems service centres. Access detailed information on the services performed and download your latest calibration cer- tificates 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.
myLearning	Welcome to the home of Leica Geosystems online learning! There are numerous online courses – avail- able to all customers with products that have valid CCPs (Customer Care Packages).
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.
mySmartNet	HxGN SmartNet is the GNSS correction service built on the world's largest reference station network, enabling GNSS-capable devices to quickly determine precise positions in the range of one to two centi- metre accuracy. The service is provided 24/7 by a highly-available infrastructure and professional sup- port team with more than 10 years of experience reliably delivering the service.
myDownloads	Downloads of software, manuals, tools, training material and news for Leica Geosystems products.



<sup>my</sup>world

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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 these directions and ac	e for the product must ensure that all users understand dhere to them.			
About warning messages		an essential part of the safety concept of the instru- erever hazards or hazardous situations can occur.			
	Warning messages				
		t about direct and indirect hazards concerning the use es 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.				
	identifying levels of ha damage. For your safet lowing table with the d	<b>CAUTION</b> and <b>NOTICE</b> are standardised signal words for zards and risks related to personal injury and property ty, it is important to read and fully understand the fol- lifferent signal words and their definitions! Supplement- symbols may be placed within a warning message as text.			
	Туре	Description			
	<b>A</b> DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.			
	Awarning	Indicates a potentially hazardous situation or an unintended use which, if not avoided, could result in death or serious injury.			
		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				
1.6					

#### Intended use

#### •

- Remote control of product Data communication with external appliances •
- Recording measurementsComputing with software

Reasonably foreseeable misuse	<ul> <li>Use of the product without instruction</li> <li>Use outside of the intended use and limits</li> <li>Disabling safety systems</li> <li>Removal of hazard notices</li> <li>Opening the product using tools, for example screwdriver, unless this is permitted for certain functions</li> <li>Modification or conversion of the product</li> <li>Use after misappropriation</li> <li>Use of products with recognisable damage or defects</li> <li>Use with accessories from other manufacturers without the prior explicit approval of Leica Geosystems</li> <li>Inadequate safeguards at the working site</li> <li>Controlling of machines, moving objects or similar monitoring application without additional control and safety installations</li> </ul>				
1.3	Limits of Use				
Environment	Suitable for use in an atmosphere appropriate for permanent human habita- tion. Not suitable for use in aggressive or explosive environments.				
	Working in hazardous areas, or close to electrical installations or sim- ilar situations Life Risk.				
	Precautions:				
	<ul> <li>Local safety authorities and safety experts must be contacted by the per- son responsible for the product before working in such conditions.</li> </ul>				
	The following advice is only valid for battery charger, power adapter and dock- ing station.				
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 become 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

#### \Lambda 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.



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#### 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.

#### 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.

# 

#### 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.

## **A**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.

#### \Lambda DANGER

#### Risk of being struck by lightning

If the product is used with accessories, for example on masts, staffs, poles, you may increase the risk of being struck by lightning. Danger from high voltages also exists near power lines. Lightning, voltage peaks, or the touching of power lines can cause damage, injury and death.

#### Precautions:

- Do not use the product in a thunderstorm as you can increase the risk of being struck by lightning.
- Be sure to remain at a safe distance from electrical installations. Do not use the product directly under or close to power lines. If it is essential to work in such an environment contact the safety authorities responsible for electrical installations and follow their instructions.
- If the product has to be permanently mounted in an exposed location, it is advisable to provide a lightning conductor system. A suggestion on how to design a lightning conductor for the product is given below. Always follow the regulations in force in your country regarding grounding antennas and masts. These installations must be carried out by an authorised specialist.
- To prevent damages due to indirect lightning strikes (voltage spikes) cables, for example for antenna, power source or modem should be protected with appropriate protection elements, like a lightning arrester. These installations must be carried out by an authorised specialist.
- If there is a risk of a thunderstorm, or if the equipment is to remain unused and unattended for a long period, protect your product additionally by unplugging all systems components and disconnecting all connecting cables and supply cables, for example, instrument - antenna.

## 

#### 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.

# 

#### 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.

#### 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.

#### For the AC power supply:

#### 

If unit is not connected to ground, death or serious injury can occur. **Precautions:** 

• To avoid electric shock power cable and power outlet must be grounded.



The following advice is only valid for battery charger, power adapter and docking station.

#### **A**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.

The following advice is only valid for battery charger, power adapter and docking station.

#### 

#### 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.

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#### 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:**

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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.

电子信息产品有毒有害物 质申明

#### 中华人民共和国电子信息产品有毒有害物质限量标准

#### (依据 SJ/T11364-2006 为标准)

#### Control of Pollution, Applicable in the People's Republic of China.

(Based on the standard SJ/T11364-2006)

<b>CS30</b> 部件 名称	有毒有害物质或元素 Toxic or Hazardous Substances and Elements					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 ( <b>Cr<sup>6+</sup>)</b>	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
终端主体 Terminal body	Х	0	0	0	0	0
电池 Battery	Х	0	0	0	0	0
充电器 Charger	Х	0	0	0	0	0
附件 Annex	Х	0	0	0	0	0

#### 表示该有毒有害物质在该部件所有均质材料中的含量在 GB/T 26572 标准规定的限量要求以下。

Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572.

# X 表示该有毒有害物质至少在该部件的某一均质材料中的含量 超出 GB/T 26572 标准规定的限量要求。

Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in GB/T 26572.



该环保使用期限是指在本指南所述的正常使用条件下,终端(不含电池)及其附件产品含有的有害物质或元素不会外泄,以及电子信息产品用户使用该产品时不会对环境造成严重污染或对其人身、财产造成严重损害的期限。

The environmental protection service life refers to the period during which the harmful substances or elements contained in the terminal (excluding battery) and its accessory products will not leak out under the normal use conditions described in this guide, and the users of electronic information products will not cause serious pollution to the environment or cause serious damage to their personal and property when using the product.

# 

#### 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.

#### 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.

#### 

#### 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.

# 

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.

#### 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.

# 

#### 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.

# 

#### 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 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.

# 

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

#### Labelling CS30

(BA950)





#### Exposure to radio frequency (RF) signals

The wireless device is a radio transmitter and receiver. It is designed and manufactured not to exceed the emission limit for exposure to radio frequency (RF) energy set by the OET Bulletin 65 Supplement C / Ministry of Health (Canada), Safety Code 6. These limits are part of comprehensive guidelines and established permitted levels of RF energy for the general population. These guidelines are based on the safety standards previously set by international standard bodies. These standards include a substantial safety margin designed to assure the safety of all persons, regardless of age and health. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

This device has been shown to be capable of compliance for localised specific absorption rate (SAR) for uncontrolled environment / general public exposure limits specific in ANSI/IEEE C95.1-1992 and had been tested in accordance with the measurement procedures specified in IEEE Std. 1528-2003.

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

#### 

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.

2	Description of the System			
2.1	Overview			
System components	CS30			
	0021682_001			
2.2	Terminology	/		
CS general descrip- tion		e term describing the various models of the multi-purpose field is used with GNSS and TS instruments.		
2.3	System Con	cept		
2.3.1	Power Conce	pt		
General	Use the batteries, chargers and accessories recommended by Leica Geosys- tems to ensure the correct functionality of the instrument.			
Power options	Power supply			
	Internally by GEB260 battery, OR			
	Externally by GEV288 power supply, OR			
	Externally by CCS02 docking station			
	If an external power supply is connected and the internal battery is inserted, then the external power is used. The internal battery is charged.			
2.3.2	Data Storage Concept			
Memory device	Device	Description		
	microSD card	All field controllers have a microSD card slot fitted as stand- ard. A microSD card can be inserted and removed. Available capacity: 256 GB.		
	USB stick	All field controllers have an USB type A and type C port fitted as standard.		
	Internal memory	All field controllers have an internal memory fitted as stand- ard. Available capacity: 64 GB.		
	While other microSD cards can be used, Leica Geosystems recom- mends to only use Leica microSD cards and is not responsible for data loss or any other error that can occur while using a non-Leica card.			

Removing the SD card or USB stick while the field controller is turned on can cause loss of data. Only remove the SD card or USB stick or unplug connecting cables when the field controller is switched off.

# **Transfer data** Data can be transferred in various ways.

F

2.4

Container for GS instrument and accessories 1/2

F

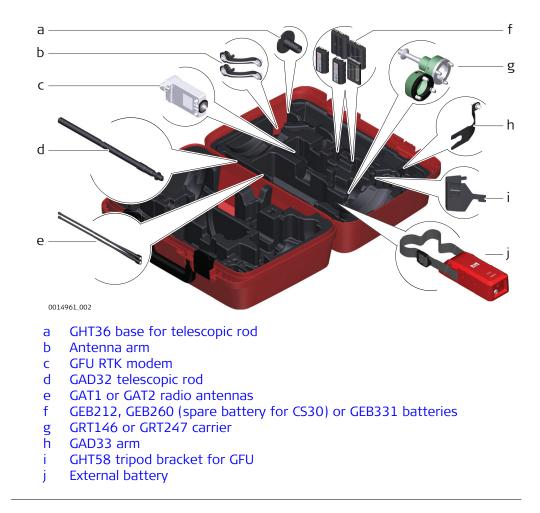
SD cards can directly be used in an OMNI drive as supplied by Leica Geosystems. Other PC card drives can require an adaptor.

#### Container Contents

0021683\_001

- a GHT63 clamp
- b Manuals and USB documentation card
- c GEB212, GEB260 (spare battery for CS30) or GEB331 batteries
- d Antenna
- e GAT18, GAT27 or GAT28 mobile antenna
- f GAT21, GAT25 or GAT26 radio antenna
- g Field controller with holder or tablet
- h Tribrach
- i Height hook
- j USB stick
- k Cables
- I Antenna
- m Stylus
- n SD cards
- o GAD34 arm 3 cm
- p TNC QN-adapter
- q Allen key and adjustment tool

#### Container for GS instrument and accessories 2/2



# Container for GS instrument and accessories



0014955\_002

- a Field controller with holder
- b Antenna
- c CRP15, quick release adaptor for quick mounting and demounting the GS18 to the pole without screwing
- d GAT25, GAT26, GAT27 or GAT28 antenna
- e Stylus
- f GHT63 clamp
- g USB stick
- h GAT1 or GAT2 radio antennas
- i Antenna arm
- j microSD card including adapter or SD card
- k Manual & USB documentation card
- I GEB212, GEB260 (spare battery for CS30) or GEB331 batteries

#### CS Components

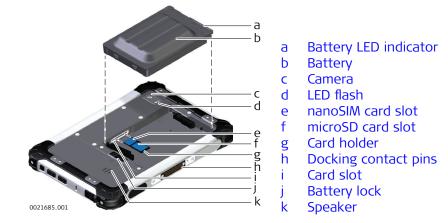
# Upside and sides of CS30

2.5



- Light sensor
- b Microphone
- c Power LED
- d Charging LED
- e WiFi GNSS 4G, passthrough connectors to
- external antenna
- f Docking contact pins
- g DC jack for power cable
- h USB type C
- USB type A

#### Underside of CS30



#### Left side of CS30



#### Keys

Key		Function
Power key	U	<ul> <li>Power on.</li> <li>If the field controller is already on:</li> <li>Activate sleep mode when held for 2 s.</li> <li>Turns the field controller off when held for 5 s.</li> </ul>
P1, function key 1		Increase the screen brightness. To increase the screen brightness by one level, press the key once. To increase the screen brightness to max- imum, press and hold the key.
P2, function key 2		Decrease the screen brightness. Todecrease the screen brightness by one level, press the key once. Todecrease the screen brightness to min- imum, press and hold the key.