

# Leica CTR35

## User Manual



Version 1.0  
English

- when it has to be **right**

**Leica**  
Geosystems

# Introduction

## Purchase

Congratulations on the purchase of a Leica CTR35.







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.

## 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 workshop.

## Symbols

The symbols used in this manual have the following meanings:

Type	Description
 <b>DANGER</b>	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 <b>WARNING</b>	Indicates a potentially hazardous situation or an unintended use which, if not avoided, could result in death or serious injury.
 <b>CAUTION</b>	Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result in minor or moderate injury.
<b>NOTICE</b>	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.

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# 1 Safety Directions

## 1.1 General Introduction

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<b>Description</b>	<p>The following directions enable the person responsible for the product, and the person who actually uses the equipment, to anticipate and avoid operational hazards.</p> <p>The person responsible for the product must ensure that all users understand these directions and adhere to them.</p>
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## 1.2 Definition of Use


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<b>Intended use</b>	<ul style="list-style-type: none"><li>• Remote control of product.</li><li>• Data communication with external appliances.</li></ul>
<b>Reasonably foreseeable misuse</b>	<ul style="list-style-type: none"><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 obvious damages 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></ul>

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## 1.3 Limits of Use

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<b>Environment</b>	<p>Suitable for use in an atmosphere appropriate for permanent human habitation: not suitable for use in aggressive or explosive environments.</p>
 <b>DANGER</b>	<p>Local safety authorities and safety experts must be contacted before working in hazardous areas, or close to electrical installations or similar situations by the person in charge of the product.</p>

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**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 e.g. radio transmitters or lasers are respected.

**WARNING**

Inadequate securing of the working site 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.

**CAUTION**

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:**

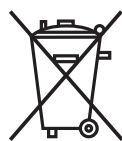
When setting-up the product, make sure that the accessories are correctly adapted, fitted, secured, and locked in position.

Avoid subjecting the product to mechanical stress.

**WARNING**

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

- If polymer parts are burnt, poisonous gases are produced which may impair health.
- 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 downloaded from the Leica Geosystems home page at <http://www.leica-geosystems.com/treatment> or received from your Leica Geosystems distributor.

<b>Description</b>	The term Electromagnetic Compatibility is taken to mean the capability of the product to function smoothly in an environment where electromagnetic radiation and electro-static discharges are present, and without causing electromagnetic disturbances to other equipment.
 <b>WARNING</b>	<p>Electromagnetic radiation can cause disturbances in other equipment.</p> <p>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.</p>
 <b>CAUTION</b>	<p>There is a risk that disturbances may be caused in other equipment if the product is used with accessories from other manufacturers, for example field computers, personal computers or other electronic equipment, non-standard cables or external batteries.</p> <p><b>Precautions:</b></p> <p>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 or other electronic equipment, pay attention to the information about electromagnetic compatibility provided by the manufacturer.</p>
 <b>CAUTION</b>	<p>Disturbances caused by electromagnetic radiation can result in erroneous measurements.</p> <p>Although the product meets the strict regulations and standards which are in force in this respect, Leica Geosystems cannot completely exclude the possibility that the product may be disturbed by intense electromagnetic radiation, for example, near radio transmitters, two-way radios or diesel generators.</p> <p><b>Precautions:</b></p> <p>Check the plausibility of results obtained under these conditions.</p>
 <b>CAUTION</b>	<p>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.</p> <p><b>Precautions:</b></p> <p>While the product is in use, connecting cables, for example product to external battery, product to computer, must be connected at both ends.</p>
 <b>WARNING</b>	<p>Electromagnetic fields can cause disturbances in other equipment, in installations, in medical devices, for example pacemakers or hearing aids and in aircraft. It can also affect humans and animals.</p> <p><b>Precautions:</b></p> <p>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.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Do not operate the product with radio or digital cellular phone devices near to medical equipment.</li> <li>• Do not operate the product with radio or digital cellular phone devices in aircraft.</li> </ul>

## 1.7

### FCC Statement, Applicable in U.S.



#### WARNING

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



#### 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.

### Labelling CTR35



**Model:** CTR35 S/N: XXXXX

**Art. No. :** 844474

**5V nominal / 0.5A max**

Leica Geosystems AG

CH-9435 Heerbrugg

Manufactured: YYYY

Made in Germany



## 1.8

### IC Statement, 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 complies with Industry Canada's licence-exempt RSS 247. Operation is subject to the following two conditions:

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

#### Canada Déclaration de Conformité

Le présent appareil est conforme aux CNR 247 d'Industrie 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.

**General****Technology**

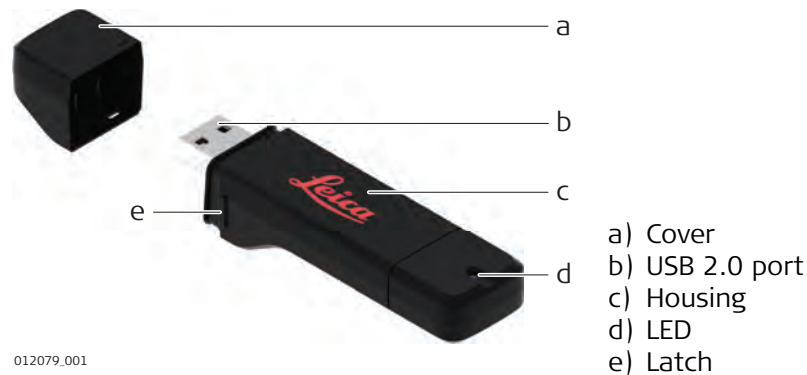
The CTR35 is a radio device having a long-range radio module. It can be used on Leica CS35 tablets only to extend the radio range.

The CTR35 is intended to be connected to the following radio devices:

- RH16/RH17
- TCPS29/TCPS30

**Frequency**

The CTR35 operates in the "2.4 GHz radio band". Using the latest in spread-spectrum, frequency hopping technology, ensures maximum security for the high speed, wireless transfer of data and video.

**Diagram CTR35****Physical features****Housing**

The robust housing with the sealing attached to the CS35 meets the IP54 standards. It provides a high level of protection against environmental influences such as rain and dust.

**USB Port**

USB 2.0 interface for power and communications.

 The CTR35 is only intended to be used with the top USB port of a CS35 tablet.

**Description of the LED indicator**

LED Status	Definition
LED off	The CTR35 is not powered.
Flashing blue, several seconds on and then off again	The CTR35 is searching for connection.
Permanently blue	The CTR35 is connected and transferring data. Depending on the data transmission rate, the LED is continuously on or flashing blue.



**Standard setup with CTR35 on CS35**

012075\_001

Standard setup at the CS35 for remote surveying using the CTR35.

The CTR35 can be connected to the following radio devices:

- RH16/RH17
- TCPS29/TCPS30

These radio devices can be attached to the following instruments:

- MS60/TS60/TS16
- MS50/TS50/TM50/TS15
- TS30/TM30/TPS1200+

**Pairing of the CTR35**

The pairing is done from the CS35 with the steps described in the following chapter, refer to **Configuration**.



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### Requirements for the correct configuration of the CS35

- Leica Captivate version 2.0 or higher
- The configuration process as described below only needs to be done once.

### Mount the CTR35 to the CS35

The CTR35 has to be mounted to the CS35 as follows for a robust fixing:

Step	Description
1.	Open the door of the top USB port on the CS35 completely.
2.	Hold down the opened door of the CS35.
3.	Insert the CTR35 with the USB plug into the top USB port of the CS35 as far as possible.  Take care that the CTR35 properly snaps in.
4.	Release the door of the CS35.  The seal of the door must sit on the latch of the CTR35.

### How to figure out the correct configuration procedure

The correct configuration procedure for the CTR35 is dependent on the Leica Captivate version running on the CS35 tablet:

Step	Description
1.	Start the CS35.
2.	Start <b>File Explorer</b> .
3.	Go to the root of the C: drive.
4.	Double tap on the file called lgs Version. <b>Notepad</b> opens the text file.
5.	Note the Leica Captivate version and the release date.
6.	Close <b>Notepad</b> .



If the release date of Leica Captivate is **before 2016-02-09** then execute all following procedures:

- Procedure 1, refer to **Install the driver of the CTR35 on the CS35**.
- Procedure 2, refer to **Set the COM Port on the CS35**.
- Procedure 3, refer to **Run the executable file on the CS35**.
- Procedure 4, refer to **Configure the CTR35 with Leica Captivate on the CS35**.




If the release date of Leica Captivate is **2016-02-09 or newer** then only execute the following two procedures:

- Procedure 2, refer to **Set the COM Port on the CS35**.
- Procedure 4, refer to **Configure the CTR35 with Leica Captivate on the CS35**.



## Install the driver of the CTR35 on the CS35

Step	Description
1.	Download the CTR35 driver from myWorld.  It is found in the folder <b>Controller\CS35\Tools</b> .
2.	Mount the CTR35 to the top USB port of the CS35, refer to <b>Mount the CTR35 to the CS35</b> .
3.	Open the <b>Start</b> screen.
4.	Tap the <b>Control Panel</b> tile.
5.	Choose <b>Device Manager</b> .
6.	Open <b>Other devices</b> from the tree view.
7.	Tap and hold onto <b>CTR35</b> .
8.	Choose <b>Update Driver Software...</b> from the context menu.
9.	Choose <b>Browse my computer for driver software</b> .
10.	Browse to the location of the driver folder.
11.	Select the folder.
12.	Press <b>OK</b> .
13.	Press <b>Next</b> .
14.	Follow the instructions until the driver is installed.  It can happen that the installation has to be done several times. After the installation of the driver the Device Manager panel is still open.
15.	Close the Device Manager.

## Set the COM Port on the CS35


Step	Description
	Mount the CTR35 to the top USB port of the CS35, refer to <b>Mount the CTR35 to the CS35</b> .
1.	Open the <b>Start</b> screen.
2.	Tap the <b>Control Panel</b> tile.
3.	Choose <b>Device Manager</b> .
4.	Open <b>Ports (COM &amp; LPT)</b> from the tree view.
5.	Tap and hold on <b>USB Serial Port CTR35 (COMxx)</b> .  Context menu is opened.
6.	Choose <b>Properties</b> from the context menu.
7.	Choose the <b>Port Settings</b> page tab.
8.	Press the <b>Advanced</b> button.  A new panel opens up.
9.	Choose COM96 from the drop-down list of <b>COM Port Number</b> .
10.	Press the <b>OK</b> button.
11.	Return to the Device Manager.
12.	Close the Device Manager.

### Run the executable file on the CS35

Step	Description
1.	Download the executable file <b>CTR35NetConnInstaller.exe</b> from myWorld.  It is found in the folder <b>Controller\CS35\Tools</b> .
2.	Run the executable file <b>CTR35NetConnInstaller.exe</b> either from a USB stick or from the CS35.  The net configurations are installed.
3.	Close all applications.


### Configure the CTR35 with Leica Captivate on the CS35

A wizard guides through the Leica Captivate connection settings.

 The **TS Connection Wizard** only runs with Leica Captivate version 2.0 or higher.

Step	Description
1.	Start Leica Captivate
2.	Choose <b>Settings</b> .
3.	Choose <b>Connections</b> .
4.	Run the <b>TS Connection Wizard</b> .
5.	Follow instructions of the <b>TS Connection Wizard</b> .
6.	Close all applications.

## Troubleshooting

Problem	Troubleshooting
CTR35 is not powered.	<ul style="list-style-type: none"> <li>Check, if CTR35 is properly connected to the correct USB port of the CS35.</li> <li>Check status of the LED. Refer to <b>Description of the LED indicator</b>.</li> </ul>
Leica Captivate error message: "Attach CTR35 LRBT stick" (but CTR35 is powered).	<ul style="list-style-type: none"> <li>Check driver installation and COM port setting. Refer to <b>Install the driver of the CTR35 on the CS35</b> and <b>Set the COM Port on the CS35</b>.</li> </ul>
No data transfer or no synchronisation to total station.	<ul style="list-style-type: none"> <li>Check the Total Station type configuration on the CS35.</li> <li>Check, if the same Leica Captivate version is running on the CS35 and the total station.</li> <li>Run executable file again. Refer to <b>Run the executable file on the CS35</b>.</li> </ul>
Range is limited.	<ul style="list-style-type: none"> <li>Switch off the internal radio and Wi-Fi of the CS35.</li> </ul> <p> Environment of powerful transmitters working within the same frequency band may cause disturbances.</p>

## 6 Care and Transport

### 6.1 Transport

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<b>Transport in a road vehicle</b>	Never carry the product loose in a road vehicle, as it can be affected by shock and vibration. Always carry the product in its transport container, original packaging or equivalent and secure it.
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<b>Shipping</b>	When transporting the product by rail, air or sea, always use the complete original Leica Geosystems packaging, transport container and cardboard box, or its equivalent, to protect against shock and vibration.
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### 6.2 Storage

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<b>Product</b>	Respect the temperature limits when storing the equipment, particularly in summer if the equipment is inside a vehicle. Refer to "7 Technical Data" for information about temperature limits.
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### 6.3 Cleaning and Drying

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<b>Product and accessories</b>	<ul style="list-style-type: none"><li>• 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.</li></ul>
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<b>Damp products</b>	Dry the product, the transport container, the foam inserts and the accessories at a temperature not greater than 40 °C/104 °F and clean them. Do not repack until everything is dry. Always close the transport container when using in the field.
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<b>Cables and plugs</b>	Keep plugs clean and dry. Blow away any dirt lodged in the plugs of the connecting cables.
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## 7

## Technical Data

### 7.1

### CTR35 Technical Data

#### Dimensions (with cover)

Length [mm]	Width [mm]	Thickness [mm]
81.65	21.40	17.06
Length [in]	Width [in]	Thickness [in]
3.21	0.84	0.67

#### Weight

Weight [g]	Weight [oz]
18	0.63

#### Power

Power supply	Power consumption
By USB 2.0 Interface: Nominal voltage 5.0 V DC (---) Voltage range 4.75–5.25 V	< 80 mA nominal 150 mA maximum

#### Range

Setup and Conditions	[m]	[ft]
With RH16/RH17 under optimal conditions (without video streaming), range up to:	400	1312

#### Environmental specifications

Temperature	[°C]	[°F]
Operating temperature	–10 ... +50	+14 ... +122
Storage temperature	–20 ... +60	–4 ... +140

External Influences	Protection
Water, dust and sand	IP54 (IEC60529)
Humidity	Up to 90% Effectively counteract the effects of condensation by periodically drying out the CTR35.

#### Input/Output

Interface
USB 2.0

#### Port

Type of connector
USB 2.0 A, for power supply and communication

**Conformity to national regulations**

- FCC Part 15 (applicable in US)
- Hereby, Leica Geosystems AG, declares that the product CTR35 are in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC and other applicable European Directives. The declaration of conformity can be consulted at

<http://www.leica-geosystems.com/ce>.



Class 1 equipment according European Directive 1999/5/EC (R&TTE) 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 1999/5/EC has to be approved prior to use and operation.
- Japanese Radio Law and Japanese Telecommunications Business Law Compliance.
  - This device is granted pursuant to the Japanese Radio Law and the Japanese Telecommunications Business Law.
  - This device should not be modified (otherwise the granted designation number will become invalid).
- This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**Frequency band****Range [MHz]**

Limited to 2402–2480

**Output power****Type****Radiated power****Output power [mW]**

Radio

Equivalent Isotropic Radiated Power (EIRP)

≤ 50





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