Leica Viva

# Leica CS10/CS15

## User Manual

**Version 1.0**
**English**

- when it has to be **right**

Leica Geosystems

# Introduction

**Purchase**

Congratulations on the purchase of a Leica CS10/CS15.

This manual contains important safety directions as well as instructions for setting up the product and operating it. Refer to "5 Safety Directions" for further information.
Read carefully through the User Manual before you switch on the product.

**Product identification**

The type and serial number of your product are indicated on the type plate.
Enter the type and serial number in your manual and always refer to this information when you need to contact your agency or Leica Geosystems authorised service workshop.

Type: _____

Serial No.: _____

**Symbols**

The symbols used in this manual have the following meanings:

| 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 and/or 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. |

**Trademarks**

- Windows is a registered trademark of Microsoft Corporation in the United States and other countries
- CompactFlash and CF are trademarks of SanDisk Corporation
- Bluetooth is a registered trademark of Bluetooth SIG, Inc.
- SD is a trademark of the SD Card Association

All other trademarks are the property of their respective owners.

**Validity of this manual**

This manual applies to the CS10 and CS15 field controllers. Differences between the various models are marked and described.

**Available documentation**

| Name | Description/Format |  |  |
|---|---|---|---|
| CS10/CS15 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 |  |  |
|---|---|---|---|
| Viva GNSS Getting Started Guide | Describes the general working of the product in standard use. Intended as a quick reference field guide. | ✓ | ✓ |

| Name | Description/Format | | |
|---|---|---|---|
| Viva TPS Getting Started Guide | Describes the general working of the product in standard use. Intended as a quick reference field guide. | ✓ | ✓ |
| Viva Series Technical Reference Manual | Overall comprehensive guide to the product and application functions. Included are detailed descriptions of special software/hardware settings and software/hardware functions intended for technical specialists. | | ✓ |

**Refer to the following resources for all CS10/CS15 documentation/software:**

- the Leica Viva Series DVD
- https://myworld.leica-geosystems.com

myworld @Leica Geosystems

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, 24 hours a day, 7 days per week. This increases your efficiency and keeps you and your equipment instantly updated with the latest information from Leica Geosystems.

| Service | Description |
|---|---|
| myProducts | Simply add all Leica Geosystems products that you and your company own. View detailed information on your products, buy additional options or Customer Care Packages (CCPs), update your products with the latest software and keep up-to-date with the latest documentation. |
| myService | View the service history of your products in Leica Geosystems Service Centers and detailed information on the services performed on your products. For your products that are currently in Leica Geosystems Service Centers view the current service status and the expected end date of service. |
| 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 and view detailed information on each request in case you want to refer to previous support requests. |
| myTraining | Enhance your product knowledge with the Leica Geosystems Campus - Information, Knowledge, Training. Study the latest online training material or download training material on your products. Keep up-to-date with the latest News on your products and register for Seminars or Courses in your country. |

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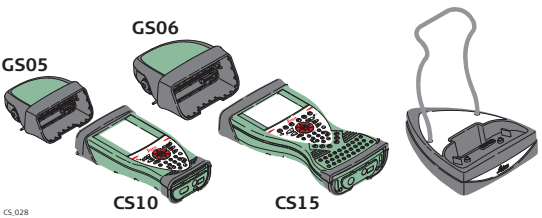
# 1 Description of the System

## 1.1 Overview

**System components**



## 1.2 Terminology

**CS general description**

CS is a collective term describing the various models (CS10/CS15) of the multi-purpose field controller which is used with GNSS and TPS instruments.

**CS available models**

| Model | Touch screen | Colour display | Internal radio modem*1 | Internal battery*2 | SD card | CompactFlash card | Bluetooth | Wireless LAN IEEE 802.11b/g*1 | Windows CE |
|---|---|---|---|---|---|---|---|---|---|
| CS10 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CS15 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| ☞ Use the supplied stylus on the screens of the touch screen. | | | | | | | | | |

*1 optional
*2 removable

## CS available radios

**Radios for remote control (RCS) are available for the following devices:**

| Radio Modem | Description |
|---|---|
| CS10 | Field controller with an integrated radio modem. This field controller has a colour display. |
| CS15 | Field controller with an integrated radio modem. This field controller has a colour display. |
| | |
| ☞ All devices contain the same spread spectrum transceiver radio modem. | |

## 1.3 System Concept

### 1.3.1 Software Concept

**Software for all CS models**

| Software type | Description |
|---|---|
| CS firmware<br>(CS_xx.fw) | This software includes:<br>- The language-specific version of Windows CE.<br>- The basic functionality of the CS. |

**Software upload**

Uploading CS firmware can take some time. Ensure that the battery is at least 75% full before beginning the upload, and do not remove the battery during the upload process.

| Software for | Description |
|---|---|
| All CS models | The software is stored in the flash RAM of the CS field controller. The software can be uploaded onto an Leica SD card, Leica CompactFlash card or a USB stick. |

| Software for | Description |
|---|---|
| | **CS firmware update instructions**<br>• Download the most recent CS firmware file from https://myworld.leica-geosystems.com. Refer to "Introduction".<br>• Connect the CS field controller to your PC. Refer to "3.1.6 Connecting to a Personal Computer".<br>• Copy CS firmware file onto a folder on the Leica SD card, Leica CompactFlash card or USB stick.<br>• Tap the Loader icon from the desktop, to run the Loader application.<br>• Browse to the directory into which you copied CS firmware file, select it and start the upload.<br>• A message will appear when the upload is complete.<br>☞ Ensure that a Leica SD card or a Leica CF card is inserted into the CS field controller before starting the upload. |

## 1.3.2 Power Concept

**General**

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

**Power options**

| Model | Power supply |
|---|---|
| all CS models | Internally via GEB211/GEB212 battery, or<br>Externally via docking station, or<br>Externally via GEV235 cable, or<br>Externally via GDC221 car adapter<br>If an external power supply is connected and the internal battery is inserted, then the external power is used. |

## 1.3.3 Data Storage Concept

**Description**

Data is stored on a memory device. The memory device can be an SD card, CompactFlash card, USB stick or internal memory.

**Memory device**

| | |
|---|---|
| SD card: | All CS field controllers have an SD card slot fitted as standard. An SD card can be inserted and removed. Available capacity: 256 MB, 1 GB. |
| CompactFlash card: | All CS field controllers have a CF card slot fitted as standard. A CompactFlash card can be inserted and removed. Available capacity: 256 MB, 1 GB. |
| USB stick: | All CS field controllers have a USB port fitted as standard. |
| Internal memory: | All CS field controllers have an internal memory fitted as standard. Available capacity: 1 GB. |

☞ While other SD cards or CompactFlash cards can be used, Leica Geosystems recommends to only use Leica SD cards or Leica CompactFlash 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, CompactFlash card or USB stick while the CS field controller is turned on can cause loss of data. Only remove the SD card, CompactFlash card or USB stick or unplug connecting cables when the CS field controller is switched off.

**Transfer data**

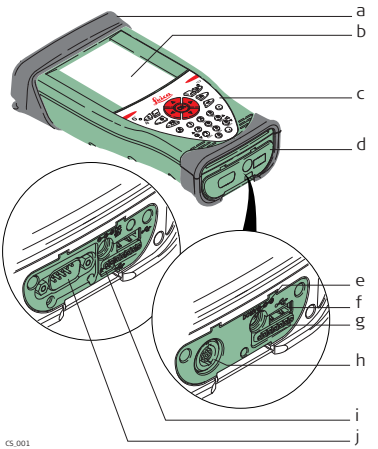
Data can be transferred in various ways. Refer to "3.1.6 Connecting to a Personal Computer".

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

# 1.4 CS Components

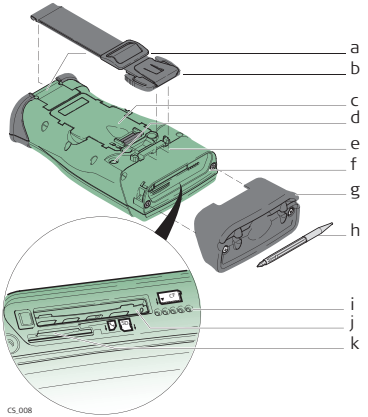
## 1.4.1 CS10

**Upside of CS10**




a) Slot Cover
b) Screen
c) Keyboard
d) Port cover
e) Power socket
f) USB A Host port
g) Docking station contacts
h) LEMO port (USB and serial)
i) USB Mini port
j) DSUB9 port

**Underside of CS10**

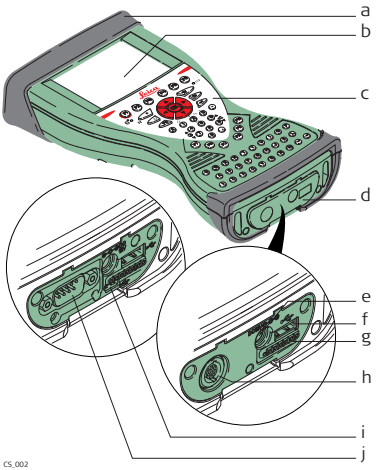



a) Hand strap bottom clips
b) Hand strap
c) Battery compartment
d) Digital camera
e) Hand strap top clips
f) Slots
g) Slot cover
h) Stylus
i) GS05 contacts
j) CompactFlash card slot
k) SD card slot

A Bluetooth port is included inside to facilitate connectivity to a digital cellular phone.

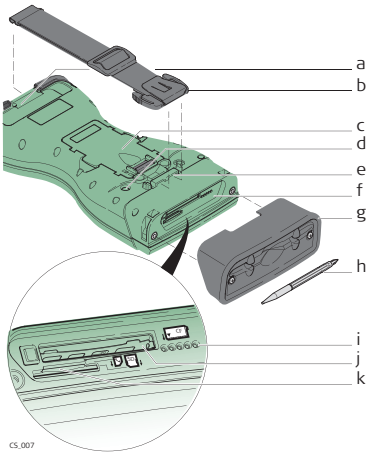
## 1.4.2 CS15

**Upside of CS15**




a) Slot cover
b) Screen
c) Keyboard
d) Port cover
e) Power socket
f) USB A Host port
g) Docking station contacts
h) LEMO port (USB and serial)
i) USB Mini port
j) DSUB9 port

**Underside of CS15**

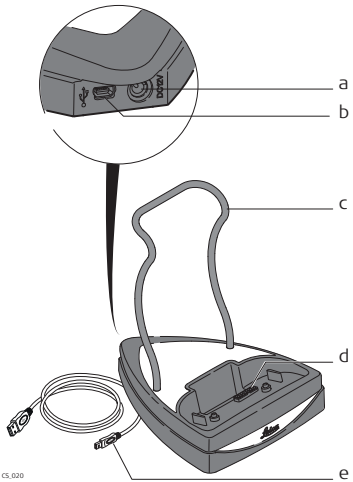



a) Hand strap bottom clips
b) Hand strap
c) Battery compartment
d) Digital camera
e) Hand strap top clips
f) Slots
g) Slot cover
h) Stylus
i) GS06 contacts
j) CompactFlash card slot
k) SD card slot

A Bluetooth port is included inside to facilitate connectivity to a digital cellular phone.

# 1.5 Docking Station Components

**Docking station**

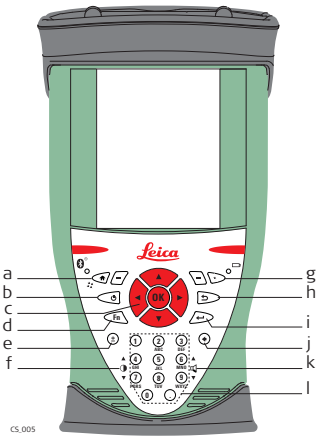



a) Power socket
b) USB port
c) Docking station bracket
d) Docking station contacts
e) GEV223 data cable

# 2 User Interface

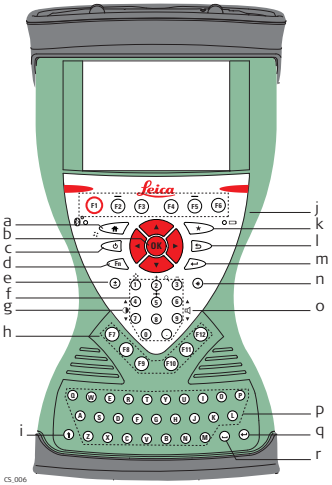
## 2.1 Keyboard

**Keyboard display CS10**




a) Home
b) ON/OFF
c) Arrow keys, **OK**
d) **Fn**
e) ± key
f) Brightness
g) Favourites
h) ESC
i) Enter
j) Backspace
k) Volume
l) Numeric keys

## Keyboard display CS15




a) Home
b) Arrow keys, **OK**
c) ON/OFF
d) **Fn**
e) ± key
f) Numeric keys
g) Brightness
h) Function keys **F7** - **F12**
i) CAPS Lock
j) Function keys **F1** - **F6**
k) Favourites
l) ESC
m) ENTER
n) Backspace
o) Volume
p) Alpha keys
q) ENTER
r) SPACE

**Keys**

| Key | Function |
|---|---|
| Function keys **F1** - **F6**  | Correspond to six softkeys that appear on the bottom of the screen when the screen is activated. |
| Function keys **F7** - **F12**  | User definable keys to execute chosen commands or access chosen screens. |
| Alpha keys  | To type letters. |
| Numeric keys  | To type numbers. |
| Caps Lock  | Switches between upper case and lower case letters. |
| Backspace  | Clears all entry at the beginning of user input.<br><br>Clears the last character during user input. |
| Esc  | Leaves the current screen without storing any changes. |
| **Fn**  | Switches between the first and second level of function keys. |
| Space  | Enters a blank. |

| Key | Function |
|---|---|
| Enter  | Selects the highlighted line and leads to the next logical menu / dialog.<br>Starts the edit mode for editable fields.<br>Opens a selectable list. |
| ON/OFF  | If CS10/CS15 already off: Turns on CS10/CS15 when held for 2 s.<br>If CS10/CS15 already on: Turns to Power Options menu when held for 2 s. |
| Favourites  | Goes to a website by simply clicking its name. |
| Home  | Switches to the Windows CE Start Menu. |
| Arrow keys  | Move the focus on the screen. |
| **OK**  | Selects the highlighted line and leads to the next logical menu / dialog.<br>Starts the edit mode for editable fields.<br>Opens a selectable list. |

## 2.2 Operating Principles

**Keyboard and touch screen**

The user interface is operated either by the keyboard or by the touch screen with supplied stylus. The workflow is the same for keyboard and touch screen entry, the only difference lies in the way information is selected and entered.

**Operation by keyboard**
Information is selected and entered using the keys. Refer to "2.1 Keyboard" for a detailed description of the keys on the keyboard and their function.

**Operation by touch screen**
Information is selected and entered on the screen using the supplied stylus.

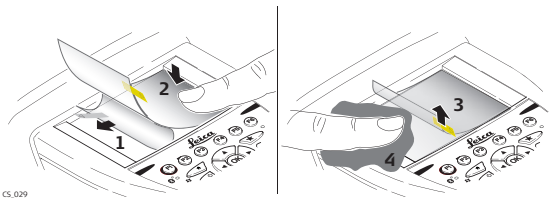
| Operation | Description |
|---|---|
| To select an item | Tap on the item. |
| To start the edit mode in editable fields | Tap on the editable field. |
| To highlight an item or parts of it for editing | Drag the supplied stylus from the left to the right. |
| To accept data entered into an editable field and exit the edit mode | Tap on the screen outside of the editable field. |
| To open a context-sensitive menu | Tap on the item and hold for 2 s. |

# 3 Operation

## 3.1 Equipment Setup

### 3.1.1 Fixing the Display Foil to the CS

**Fixing the display foil to the CS step-by-step**

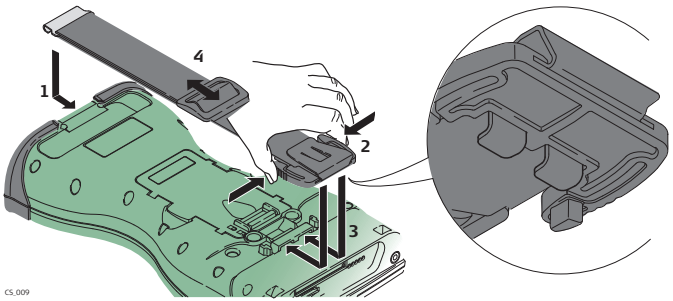



| Step | Description |
|---|---|
| ☞ | Ensure that the display of the CS is free of dust and grease. |
| ☞ | The non-reflecting display foil has a silver-coloured sticker to peel away the carrier foil from the actual display foil. |
| 1. | Touch the silver-coloured sticker with two fingers and pull it slowly upwards. The carrier foil is peeling away.<br>☞ Do not peel the carrier foil more than 2 cm - 3 cm away. |

| Step | Description |
|---|---|
| 2. | Fix the laid open adhesive underside of the display foil at the display border.<br>☞ Pay attention that the display foil is not fixed between display and display frame. |
| 3. | Peel away the carrier foil bit by bit and smooth it out slowly onto the display. |
| 4. | Potential air bubbles between display and display foil have to be smoothed out using the included microfibre cloth.<br>☞ Do not use sharp objects! |

## 3.1.2 Fixing a Hand Strap to the CS

**Fixing the CS to a hand strap step-by-step**

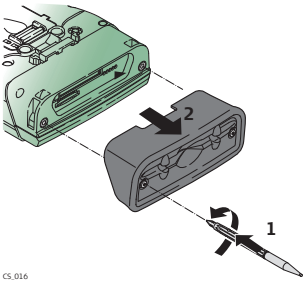



| Step | Description |
|---|---|
| ☞ | Turn the CS field controller over. |
| 1. | Take the end of the hand strap and clip it to the base of CS field controller. |
| 2. | Compress the clips of the main hook. |
| 3. | Lower the main hook onto the pivot knob of the CS field controller.<br>A click can be felt when the clip is secure. |

| Step | Description |
| --- | --- |
| 4. | Adjust the length of the hand strap. |

## 3.1.3 Fixing the Slot Cover to the CS

**Fixing the slot cover to the CS step-by-step**

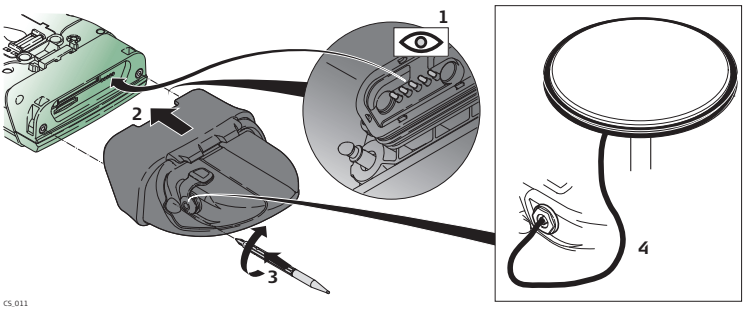



| Step | Description |
|---|---|
| 1. | Press the screwdriver end of the supplied stylus on the quarter-turn screws and loosen them. |
| 2. | Remove the slot cover. |
| ☞ | Reattach the slot cover with the stylus, making sure the quarter-turn screws are seated. |

## 3.1.4 Setting up as Handheld GNSS

The setup GS05/CS10 is identical to the setup GS06/CS15. For simplicity, the setup GS05/CS10 is used in the following.

**Attaching the GS05 to the CS10 step-by-step**

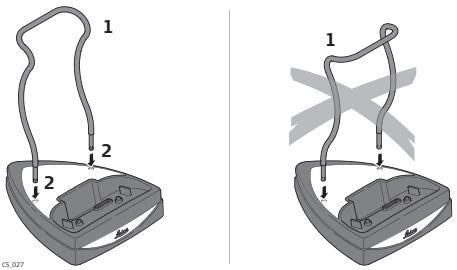



| Step | Description |
|---|---|
| | Detach the slot cover from the CS10. Refer to "3.1.3 Fixing the Slot Cover to the CS". |
| 1. | Check the position of the contacts in the inner surface of the GS05. |

| Step | Description |
|---|---|
| 2. | Attach the GS05 to the CS10. |
| 3. | Press the screwdriver end of the supplied stylus on the quarter-turn screws and tighten them. |
| 4. | To achieve the optimal satellite tracking performance, mount the AS05 (external GNSS antenna) on the GS05. |

## 3.1.5 Setting up the Docking Station

**Mounting components of the docking station step-by-step**

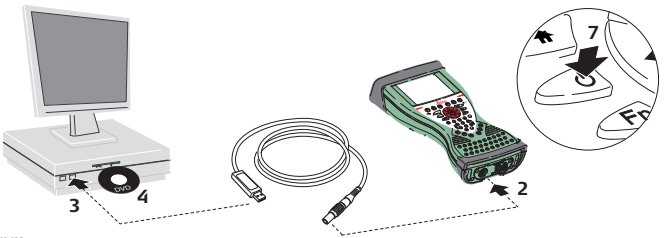



| Step | Description |
|---|---|
| 1. | Hold the docking station bracket as shown in the illustration in relation to the docking station rack. |
| 2. | Slightly press the holder into the docking station rack. A click can be felt when the holder is secure. |

## 3.1.6 Connecting to a Personal Computer

Microsoft ActiveSync (for PCs with Windows XP operating system) or Windows Mobile Device Center (for PCs with Windows Vista operating system) is the synchronisation software for Windows mobile-based pocket PCs. Microsoft ActiveSync or Windows Mobile Device Center enables a PC and a Windows mobile-based pocket PC to communicate.

**Connect USB cable to PC for the first time step-by-step**

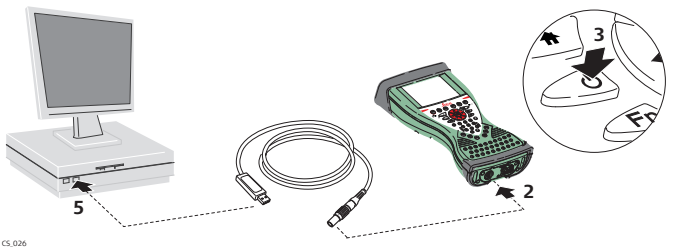



| Step | Description |
|---|---|
| 1. | Start the PC. |

| Step | Description |
|---|---|
| 2. | Plug the GEV234 cable into CS field controller.<br>☞ For CS field controllers with DSUB9 connector, the GEV223 cable has to be used.<br>☞ Ensure that the CS field controller is turned off. |
| 3. | Plug the GEV234 cable into the USB port of the PC.<br>☞ If the CS field controller is already turned on, the new hardware wizard starts up automatically. Click **Cancel** to quit the new hardware wizard if it starts. |
| 4. | Insert the Leica Viva Series DVD. |
| 5. | Run the **SetupCS.exe** to install the drivers necessary for your instrument. |
| 6. | The **Welcome to InstallShield Wizard for Remote NDIS based LGS device connection** window appears. |
| 7. | Turn on the CS field controller. |
| 8. | **Next>**. |
| 9. | The **Ready to Install the Program** window appears. |
| 10. | **Install**. The drivers will be installed on your PC. |
| 11. | The **InstallShield Wizard Completed** window appears. |
| 12. | Click **Finish** to exit the wizard. |

| Step | Description |
|---|---|
| | For PCs with Windows XP operating system: |
| 13. | Run the ActiveSync installation program if not already installed. |
| 14. | Allow USB connections inside the **Connection Settings** window of ActiveSync. |
| | For PCs with Windows Vista operating system: |
| 15. | Run the Windows Mobile Device Center installation if not already installed. |

**Connect to PC via USB cable step-by-step**



| Step | Description |
|---|---|
| 1. | Start the PC. |
| 2. | Plug the GEV234 cable into CS field controller.<br>For CS field controllers with DSUB9 connector, the GEV223 cable has to be used. |
| 3. | Turn the CS field controller on. |
| 4. | Plug the GEV234 cable into the USB port of the PC. |
| | For PCs with Windows XP operating system: |
| | ActiveSync starts up automatically. If does not start automatically, start ActiveSync. If not already installed, run the ActiveSync installation program. |
| 5. | Allow USB connections inside the **Connection Settings** window of ActiveSync. |
| 6. | Click **Explore** in ActiveSync. |
| | The folders on the CS field controller are displayed under **Mobile Devices**. The folders of the data storage device can be found in **StorageCard**. |
| | For PCs with Windows Vista operating system: |

| Step | Description |
|---|---|
| | Windows Mobile Device Center starts up automatically. If does not start automatically, start Windows Mobile Device Center. If not already installed, run the Windows Mobile Device Center installation program. |

## 3.2 Power Functions

**Turning CS field controller on**

Press and hold power key ( ) for 2 s.

CS field controller must have a power supply.

**Power Options menu**

Press and hold power key ( ) for 2 s to open **Power Options** menu.

CS field controller must be on.

| Option | Description |
|---|---|
| **Turn off** | Turn CS field controller off. |
| **Stand-by** | Put CS field controller into stand-by mode.<br>In stand-by mode, CS field controller shuts down and reduces power consumption. Rebooting from stand-by mode is quicker than a cold start after turning off. |
| **Lock keyboard** | Lock the keyboard. Option turns to **Unlock keyboard**. |
| **Turn off touch screen** | Disable touch screen. Option turns to **Turn on touch screen**. |

| Option | Description |
|---|---|
| **Reset...** | Perform one of the following options:<br>• **Restart** (restarts Windows CE)<br>• **Reset Windows CE** (resets Windows CE and communication settings to factory defaults)<br>• **Reset installed software** (resets settings of all installed software)<br>• **Reset Windows CE and installed software** (resets Windows CE and settings of all installed software) |

## 3.3 Batteries

### 3.3.1 Operating Principles

**Charging / first-time use**

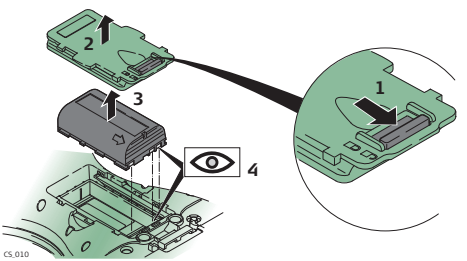
- The battery must be charged prior to using it for the first time because it is delivered with an energy content as low as possible.
- The permissible temperature range for charging is between 0°C to +40°C/+32°F to +104°F. For optimal charging, we recommend charging the batteries at a low ambient temperature 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 if 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.

## 3.3.2 Changing the Battery

**Insert and remove the battery step-by-step**

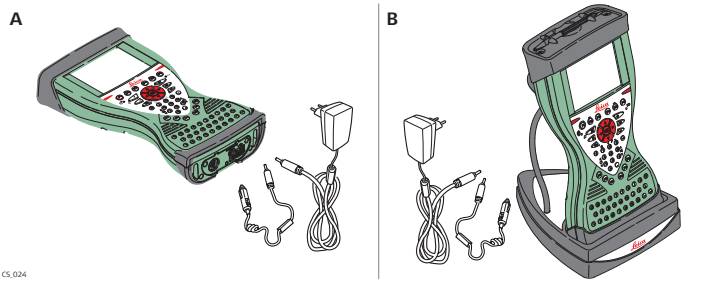



| Step | Description |
|---|---|
| ☞ | Turn CS field controller over to gain access to the battery compartment. |
| 1. | Push the slide fastener in the direction of the arrow with the open-lock symbol. |
| 2. | Open the battery compartment. |
| 3. | Pull the battery from the battery compartment. |
| 4. | Place the battery into the battery compartment with the Leica logo facing to the top. |

| Step | Description |
|---|---|
| 5. | Close the battery compartment by pushing the slide fastener in the direction of the arrow with the close-lock symbol. |

## 3.3.3 Charging the Battery

**Charge battery step-by-step**




| Step | Description |
|---|---|
| 1. | Connect the GEV235 power adapter or GDC221 car adapter with the CS field controller (A) or the docking station (B) and an A/C plug. |
| 2. | The power LED on the CS field controller switches on. When CS field controller's battery is fully charged the LED switches off again.<br>Refer to "LED indicators" for information about the power LED. |

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

**Warning**

If you open 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 workshops are entitled to repair these products.

The following advice is only valid for batteries, power adapter or docking station.

**Caution**

The product is not designed for use under wet and severe conditions. If unit becomes wet it may cause you to receive an electric shock.

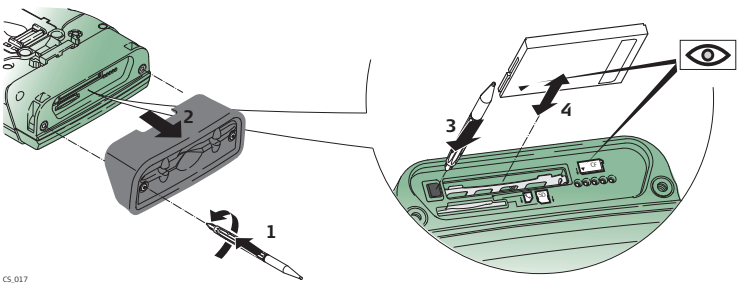
**Precautions:**
Use the product only in dry environments, for example in buildings or vehicles. Protect the product against humidity. If the product becomes humid, it must not be used!

## 3.4 Working with the Memory Device

- Keep the card dry.
- Use it only within the specified temperature range.
- Do not bend the card.
- Protect the card from direct impacts.

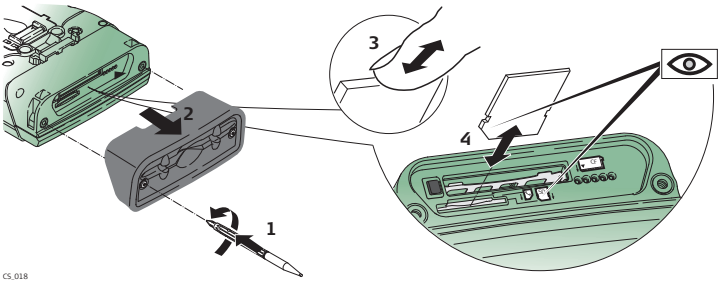
Failure to follow these instructions could result in data loss and/or permanent damage to the card.

**Insert and remove a CompactFlash card step-by-step**



| Step | Description |
|---|---|
| ☞ | The CompactFlash card is inserted into a slot inside the top of the CS10/CS15. |
| 1. | Refer to "Fixing the slot cover to the CS step-by-step". Loosen the screws inside the slot cover on top of the CS10/CS15 using the screwdriver end of the stylus. |
| 2. | Detach the slot cover from the CS10/CS15. |
| 3. | Slide the card firmly into the slot until it clicks into position.<br>☞ Do not force the card into the slot. |
| 4. | The card must be held with the contacts facing the slot. |
| 5. | Attach the slot cover and tighten the screws. |
| 6. | To remove the card, detach the slot cover of the CS10/CS15. |
| 7. | Press the eject button next to the card slot twice. |
| 8. | Remove the CompactFlash card and attach the slot cover. |

**Insert and remove an SD card step-by-step**




| Step | Description |
|---|---|
| ☞ | The SD card is inserted into a slot inside the top of the CS10/CS15. |
| 1. | Refer to "Fixing the slot cover to the CS step-by-step". Loosen the screws inside the slot cover on top of the CS10/CS15 using the screwdriver end of the stylus. |
| 2. | Detach the slot cover from the CS10/CS15. |
| 3. | Slide the card firmly into the slot until it clicks into position.<br>☞ Do not force the card into the slot. |
| 4. | The card must be held with the contacts facing the slot. |

| Step | Description |
|---|---|
| 5. | Attach the slot cover and tighten the screws. |
| 6. | To remove the card, detach the slot cover of the CS10/CS15. |
| 7. | Gently press the top of the card to release it from the slot. |
| 8. | Remove the SD card and attach the slot cover. |

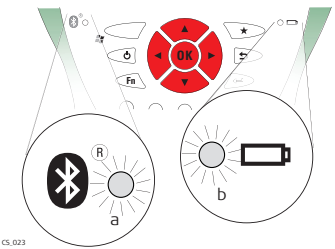
# 3.5 LED Indicators on CS10/CS15

**LED indicators**

**Description**

The CS field controller has **L**ight **E**mitting **D**iode indicators. They indicate the basic field controller status.

**Diagram**




a) Bluetooth LED
b) Power LED

**Description of the LEDs**

| IF the | is | THEN |
|---|---|---|
| Bluetooth LED | green | Bluetooth is in data mode and ready for connecting. |
| | purple | Bluetooth is connecting. |
| | blue | Bluetooth has connected. |
| | flashing blue | data is being transferred |
| Power LED | off | power is off. |
| | green | power is okay. |
| | flashing green | power is okay. The battery is being charged. |
| | yellow | power is low. The remaining time for which enough power is available depends on the use of wireless modules, the temperature and the age of the battery. |
| | flashing yellow | power is low. The remaining time for which enough power is available depends on the use of wireless modules, the temperature and the age of the battery. The battery is being charged. |
| | red | power is very low. The battery should be changed. |

| IF the | is | THEN |
|---|---|---|
| | flashing red | power is very low. The battery is being charged. |

## 3.6 Using the Digital Camera

**Overview**

Both CS field controllers are equipped with a digital camera located at the underside (refer to "1.4 CS Components"). If a hand strap or pole holder plate is mounted, the camera view is not limited. The camera application can be started from the desktop icon **Camera** or from the Start menu **Start - Programs - Camera**.

**Taking a picture step-by-step**

| Step | Description |
|---|---|
| 1. | Aim the camera to the desired target. |
| 2. | Check the view at the display. |
| 3. | Press **OK** or click **Capture** to take the picture.<br>☞ **Capture** changes to **Save**. |
| 4. | Press **OK** again or click **Save** to open the **Save As** dialog. |
| 5. | Click **Discard** to reject the picture. |

**Storing a picture step-by-step**

| Step | Description |
|---|---|
| ☞ | The **Save As** dialog is Windows CE standard and allows to name the picture, choose the location or to create a folder. |

| Step | Description |
|---|---|
| 1. | Browse to the desired folder or create a new one. |
| 2. | Name the picture. |
| 3. | Press **OK** to save it and return to the camera view. |
| 4. | Press **Cancel** to reject the picture and to return to the camera view without saving the picture. |

# 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 transport container and secure it. |
| **Shipping** | 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. |
| **Shipping, transport of batteries** | 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. |

## 4.2 Storage

**Product**

Respect the temperature limits when storing the equipment, particularly in summer if the equipment is inside a vehicle. Refer to "6 Technical Data" for information about temperature limits.

**Li-Ion batteries**

- Refer to "6 Technical Data" for information about storage temperature range.
- At the recommended storage temperature range, batteries containing a 10% to 50% charge can be stored for up to one year. After this storage period the batteries must be recharged.
- 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 -20°C to +30°C/-4°F to 86°F in a dry environment is recommended to minimise self-discharging of the battery.

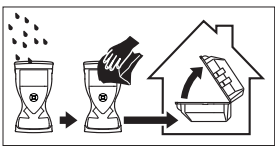
## 4.3 Cleaning and Drying

**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 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.



**Cables and plugs**

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

**Connectors with dust caps**

Wet connectors must be dry before attaching the dust cap.

# 5 Safety Directions

## 5.1 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.

## 5.2 Intended Use

**Permitted use**

- Remote control of product.
- Data communication with external appliances.

**Adverse use**

- Use of the product without instruction.
- Use outside of the intended 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 damages or defects.
- Use with accessories from other manufacturers without the prior explicit approval of Leica Geosystems.
- Inadequate safeguards at the working site, for example when measuring on roads.
- Controlling of machines, moving objects or similar monitoring application without additional control- and safety installations.

**Warning**

Adverse use can lead to injury, malfunction and damage.
It is the task of the person responsible for the equipment to inform the user about hazards and how to counteract them. The product is not to be operated until the user has been instructed on how to work with it.

## 5.3 Limits of Use

**Environment**

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

**Danger**

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.

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.

## 5.4 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.

**Manufacturers of non Leica Geosystems accessories**

The manufacturers of non Leica Geosystems accessories for the product are responsible for developing, implementing and communicating safety concepts for their products, and are also responsible for the effectiveness of those safety concepts in combination with the Leica Geosystems product.

**Person in charge of the product**

The person in charge of the product has the following duties:

- To understand the safety instructions on the product and the instructions in the user manual.
- 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 radio transmitters are respected.

**Warning** The person responsible for the product must ensure that it is used in accordance with the instructions. This person is also accountable for the training and the deployment of personnel who use the product and for the safety of the equipment in use.

## 5.5 Hazards of Use

**Warning**

The absence of instruction, or the inadequate imparting of instruction, can lead to incorrect or adverse use, and can cause accidents with far-reaching human, material, financial and environmental consequences.

**Precautions:**

All users must follow the safety directions given by the manufacturer and the directions of the person responsible for the product.

**Danger**

Because of the risk of electrocution, it is dangerous to use poles 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** 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 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 and accident prevention and road traffic.

---

**Warning** If computers intended for use indoors are used in the field there is a danger of electric shock.

**Precautions:**
Adhere to the instructions given by the computer manufacturer regarding field use with Leica Geosystems products.

---

**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 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**

Using a battery charger not recommended by Leica Geosystems can destroy the batteries. This can cause fire or explosions.

**Precautions:**
Only use chargers recommended by Leica Geosystems to charge the batteries.

**Caution**

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 of it, discharge the batteries by running 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**

High mechanical stress, high ambient temperatures or immersion into fluids can cause leakage, fire or explosions of the batteries.

**Precautions:**

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

---

**Warning**

If battery terminals come in contact with jewellery, keys, metallised paper or other metals, short circuited battery terminals 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.

---

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

---

**Warning**

If you open 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 workshops are entitled to repair these products.

---

The following advice is only valid for batteries, power adapter or docking station.

---

**Caution**

The product is not designed for use under wet and severe conditions. If unit becomes wet it may cause you to receive an electric shock.

**Precautions:**

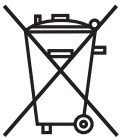
Use the product only in dry environments, for example in buildings or vehicles. Protect the product against humidity. If the product becomes humid, it must not be used!

**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.
- 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 downloaded from the Leica Geosystems home page at http://www.leica-geosystems.com/treatment or received from your Leica Geosystems dealer.

**Warning**

Only Leica Geosystems authorised service workshops are entitled to repair these products.

## 5.6 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 can cause disturbances in other equipment.

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.

The product is a class A product when operated with the internal batteries. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures (remove internal batteries and power the product directly with a power cable).

**Caution**

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, two-way radios, non-standard cables or external batteries.

**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 and two-way radios, pay attention to the information about electromagnetic compatibility provided by the manufacturer.

**⚠ Caution**

Disturbances caused by electromagnetic radiation can result in erroneous measurements.
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.
**Precautions:**
Check the plausibility of results obtained under these conditions.

**⚠ Warning**

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 or digital cellular phones**

**⚠ 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 aircraft. It 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 aircraft.

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

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

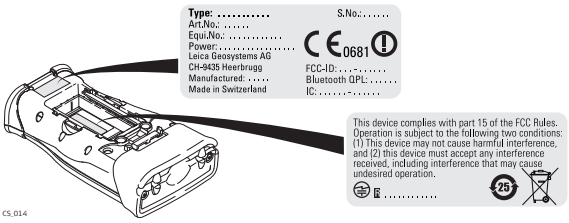
**Warning**

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, can 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:

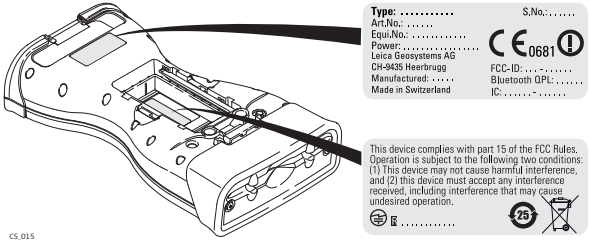
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the instrument.
- Connect the equipment into an outlet on a circuit different from that to which the instrument is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

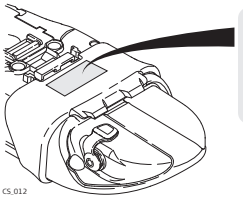
## Labelling CS10



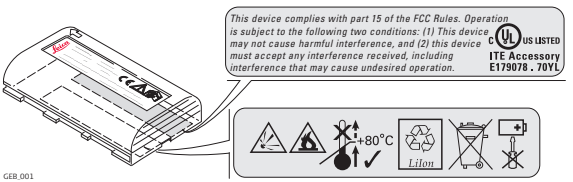

## Labelling CS15



## Labelling GS05, GS06




## Labelling internal battery GEB211, GEB212



**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.

# 6 Technical Data

## 6.1 CS10/CS15 Technical Data

| | |
|---|---|
| **Design** | Glass reinforced polymer housing with optional integrated battery and radio modem. |
| **Control unit** | **CS10** |
| | Display: VGA (480 x 640 pixels), graphics capable LCD, illumination, touch screen, colour |
| | Keyboard: 26 keys, illumination |
| | Touch screen: Toughened film on glass |
| | Sound: Integrated sealed speaker and microphone |
| | Digital camera: Resolution: 1600 x 1200 pixels, fixed focus lens, image capture: JPEG |
| | **CS15** |
| | Display: VGA (640 x 480 pixels), graphics capable LCD, illumination, touch screen, colour |
| | Keyboard: 65 keys including 12 function keys, illumination |
| | Touch screen: Toughened film on glass |
| | Sound: Integrated sealed speaker and microphone |
| | Digital camera: Resolution: 1600 x 1200 pixels, fixed focus lens, image capture: JPEG |

**Dimensions**

| Type | Length [m] | Width [m] | Thickness [m] |
|---|---|---|---|
| CS10 | 0.200 | 0.102 | 0.045 |
| CS15 | 0.245 | 0.125 | 0.045 |

**Weight**

| Type | Weight [kg]/[lbs] |
|---|---|
| CS10, with battery, internal radio and WLAN | 0.720/1.587 |
| CS15, with battery, internal radio and WLAN | 0.870/1.918 |

**Recording**

Data can be recorded on the SD card, CompactFlash card, USB stick or in the internal memory.

**Power**

| Type | Consumption [W] | External supply voltage |
|---|---|---|
| CS10/CS15 | 2.0 | Nominal voltage 12 V DC (⎓)<br>Voltage range 10.5 V-28 V |

**Internal battery**

| Type | Battery | Voltage | Capacity | Operating time, typical* |
|---|---|---|---|---|
| CS10/CS15 | Li-Ion | 7.4 V | GEB212: 2.6 Ah | 10 h |

* Operating time depends on use of wireless communication devices.

## Environmental specifications

### Temperature

| Type | Operating temperature [°C] | Storage temperature [°C] |
|---|---|---|
| CS10/CS15 | -30 to +60 | -40 to +80 |
| Internal battery | -20 to +55 | -40 to +70 |

### Protection against water, dust and sand

| Type | Protection |
|---|---|
| CS10/CS15 | IP67 (IEC60529)<br>Dust tight<br>Waterproof to 1 m temporary immersion |

### Humidity

| Type | Protection |
|---|---|
| CS10/CS15 | Up to 100 %<br>The effects of condensation are to be effectively counteracted by periodically drying out CS10/CS15. |

**Interfaces**

| Type | RS232 | USB Host | USB OTG | Bluetooth | WLAN |
|---|---|---|---|---|---|
| CS10/CS15 | LEMO port or DSUB9 | LEMO port or USB A | LEMO port, USB Mini-AB or docking station contacts | Class 2 | IEEE 802.11b/g |

**Data format for RS232**

The default values are:

Baud rate: 115200
Parity: None
Terminator: CR/LF
Data bits: 8
Stop bits: 1

**Ports**

| Type | 8 pin LEMO-1 | DSUB9 | USB A Host | USB Mini | Docking station contacts |
|---|---|---|---|---|---|
| CS10/CS15 | For power and/or communication | For communication | | | For power and/or communication |

## 6.2 GS05/GS06 Technical Data

### 6.2.1 Tracking Characteristics

| | |
|---|---|
| **Instrument technology** | SmartTrack+ |
| **Satellite reception** | Single frequency |
| **Instrument channels** | GS05/GS06: Up to 14 channels continuous tracking on L1 (GPS); up to 14 channels continuous tracking on L1 (GLONASS); one channel tracking SBAS.<br>☞ Depending on the satellite systems and signals configured, a maximum number of 14 channels is allocated. |

**Supported codes and phases**

**GPS**

| Type | L1 |
|---|---|
| GS05/GS06 | Carrier phase, C/A-code |

**GLONASS**

| Type | L1 |
|---|---|
| GS05/GS06 | Carrier phase, C/A-code |

Carrier phase and code measurements on L1 (GPS) are fully independent with AS on or off.

**Satellites tracked**

GS05/GS06: Up to 14 simultaneously on L1 (GPS) + up to 14 simultaneously on L1 (GLONASS) + up to one SBAS

## 6.2.2 Accuracy

Accuracy is dependent upon various factors including the number of satellites tracked, constellation 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 measurements processed using LGO and on real-time measurements.

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

**Differential code**

The baseline precision of a differential code solution for static and kinematic surveys is 40 cm.

**Differential phase in post-processing**

| Static | Kinematic |
|---|---|
| 10 mm + 2 ppm | 20 mm + 2 ppm |

## 6.2.3 Technical Data

**Description and use**

The table gives a description and the intended use of the GS05/GS06.

| Type | Description | Use |
|---|---|---|
| GS05 | L1 GPS, GLONASS SmartTrack+ antenna. | With CS10 field controller. |
| GS06 | L1 GPS, GLONASS SmartTrack+ antenna. | With CS15 field controller. |

**Dimensions**

| Type | Length [m] | Width [m] | Thickness [m] |
|---|---|---|---|
| GS05 with CS10 | 0.278 | 0.102 | 0.045 |
| GS06 with CS15 | 0.323 | 0.125 | 0.045 |

**Connector**

5 pin interface port

**Weight**

| Type | Weight [kg]/[lbs] |
|---|---|
| GS05 with CS10 | 0.750/1.653 |
| GS06 with CS15 | 0.910/2.006 |

**Power**

Power consumption: 0.5 W typically, 45 mA
External supply voltage: Nominal 12 V DC (⎓), voltage range 5 V-28 V DC

**Electrical data**

| Type | GS05/GS06 |
|---|---|
| Voltage | - |
| Current | - |
| Frequency | GPS L1 1575.42 MHz<br>GLONASS L1 1602.5625 MHz-1611.5 MHz |
| Gain | Typically 27 dBi |
| Noise Figure | Typically < 2 dBi |

## Environmental specifications

### Temperature

| Operating temperature [°C] | Storage temperature [°C] |
|---|---|
| -30 to +60 | -40 to +80 |

### Protection against water, dust and sand

| Protection |
|---|
| IP67 (IEC 60529) |
| Dust tight |
| Protected against water jets |
| Waterproof to 1 m temporary immersion |

### Humidity

| Protection |
|---|
| Up to 100 % |
| The effects of condensation are to be effectively counteracted by periodically drying out the antenna. |

## 6.3 Antennas Technical Data

**Description and use**

The table gives a description and the intended use of the antenna.

| Type | Description | Use |
|---|---|---|
| AS05 | L1 GPS, GLONASS SmartTrack+ antenna with built-in ground plane. | With CS10/GS05, CS15/GS06. |

**Dimensions**

| Type | AS05 |
|---|---|
| Height | 6.2 cm |
| Diameter | 17.0 cm |

**Connector**

AS05: TNC female

**Mounting**

AS05: 5/8" Whitworth

**Weight**

AS05: 0.4 kg

## Electrical data

| Type | AS05 |
|---|---|
| Voltage | 4.5 V to 18 V DC |
| Current | 35 mA typical |
| Frequency | GPS L1 1575.42 MHz<br>GLONASS L1 1602.5625 MHz-1611.5 MHz |
| Gain (typically) | 27 dBi |
| Noise Figure (typically) | < 2 dBi |

## Environmental specifications

**Temperature**

| Type | Operating temperature [°C] | Storage temperature [°C] |
|---|---|---|
| AS05 | -40 to +70 | -55 to +85 |

**Protection against water, dust and sand**

| Type | Protection |
|---|---|
| AS05 | IP67 (IEC 60529)<br>Dust tight<br>Protected against water jets |

| Type | Protection |
|---|---|
| | Waterproof to 1 m temporary immersion |

**Humidity**

| Type | Protection |
|---|---|
| AS05 | Up to 100 %<br>The effects of condensation are to be effectively counteracted by periodically drying out the antenna. |

**Cable length**

| Separation distance from instrument ... | to antenna | Supplied cable lengths [m] |
|---|---|---|
| GS05/GS06 | AS05 | 1.2 |

# 6.4 Conformity to National Regulations

## 6.4.1 CS10

**Conformity to national regulations**

- FCC Part 15 (applicable in US)
- Hereby, Leica Geosystems AG, declares that the product CS10 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. The declaration of conformity can be consulted at http://www.leica-geosystems.com/ce.

Class 2 equipment according European Directive 1999/5/EC (R&TTE) for which following EEA Member States apply restrictions on the placing on the market or on the putting into service or require authorisation for use:

- France
- Italy
- Norway (if used in the geographical area within a radius of 20km from the centre of Ny-Ålesund)

- 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.

**Frequency band**

| Type | Frequency band [MHz] |
|---|---|
| CS10, Bluetooth | 2402 - 2480 |
| CS10, WLAN | 2400 - 2484 |

**Output power**

| Type | Output power [mW] |
|---|---|
| CS10, Bluetooth | 2.5 |
| CS10, WLAN (802.11b) | 50 |
| CS10, WLAN (802.11g) 6 Mbit/s-36 Mbit/s | 50 |
| CS10, WLAN (802.11b) 48 Mbit/s-56 Mbit/s | 31.6 |

**Antenna**

| Type | Antenna | Gain [dBi] | Connector | Frequency band [MHz] |
|---|---|---|---|---|
| CS10, Bluetooth | Integrated antenna | - | - | - |
| CS10, WLAN | Integrated antenna | - | - | - |
| GS05 | Internal GNSS antenna element (receive only) | - | - | - |

## 6.4.2 CS15

**Conformity to national regulations**

- FCC Part 15 (applicable in US)
- Hereby, Leica Geosystems AG, declares that the product CS15 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. The declaration of conformity can be consulted at http://www.leica-geosystems.com/ce.

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- France
- Italy
- Norway (if used in the geographical area within a radius of 20km from the centre of Ny-Ålesund)

- 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.

**Frequency band**

| Type | Frequency band [MHz] |
|---|---|
| CS15, Bluetooth | 2402 - 2480 |
| CS15, WLAN | 2400 - 2484 |

**Output power**

| Type | Output power [mW] |
|---|---|
| CS15, Bluetooth | 2.5 |
| CS15, WLAN (802.11b) | 50 |
| CS15, WLAN (802.11g) 6 Mbit/s-36 Mbit/s | 50 |
| CS15, WLAN (802.11b) 48 Mbit/s-56 Mbit/s | 31.6 |

**Antenna**

| Type | Antenna | Gain [dBi] | Connector | Frequency band [MHz] |
|---|---|---|---|---|
| CS15, Bluetooth | Integrated antenna | - | - | - |
| CS15, WLAN | Integrated antenna | - | - | - |
| GS06 | Internal GNSS antenna element (receive only) | - | - | - |

# 7 International Limited Warranty, Software Licence Agreement

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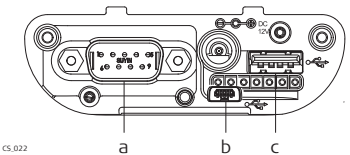
# Appendix A Pin Assignments and Sockets

**Description**

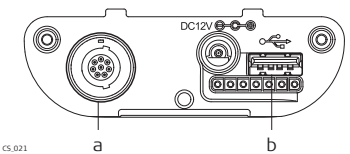
Some applications require knowledge of the pin assignments for the CS10/CS15 ports. In this chapter, the pin assignments and sockets for the ports of the CS10/CS15 are explained.

**Ports at the instrument bottom panel - DSUB9 connector**



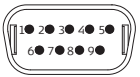

a) DSUB9 port
b) USB Mini port
c) USB A Host port

**Ports at the instrument bottom panel - Lemo connector**




a) Lemo port (USB and serial)
b) USB A Host port

**Pin assignments for RS232 serial port**




| Pin | Signal Name | Function | Direction |
|---|---|---|---|
| 1 | NC | Not connected | - |
| 2 | RxD | RS232, receive data | In |
| 3 | TxD | RS232, transmit data | Out |
| 4 | NC | Not connected | - |
| 5 | GND | Signal Ground | - |
| 6 | NC | Not connected | - |
| 7 | RTS | RS232, request to send | Out |
| 8 | CTS | RS232, clear to send | In |
| 9 | NC | Not connected | - |

**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 | ID | Identification pin | In or out |
| 7 | PWR | Power input, 10.5 V-28 V | In |
| 8 | TRM_ON/USB_ID | RS232, general purpose signal | In or out |

**Sockets**

| | |
|---|---|
| 9 pin RS232: | RS232, 9 pin, DE9 |
| 8 pin LEMO-1: | LEMO-1, 8 pin, LEMO EGI.1B.308.CLN |

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**T**

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