



Leica Viva GNSS

Getting Started Guide



Version 4.5
English

- when it has to be **right**

Leica
Geosystems

Introduction



To use the product in a permitted manner, please refer to the detailed safety instructions in the Leica CS10/CS15 User Manual, the Leica GS10/GS15 User Manual and the Leica GS25 User Manual.



For detailed descriptions of all functions and settings of the product and applications, please refer to the Leica Viva Series Technical Reference Manual.

Purpose of this manual

This Getting Started Guide is intended as a quick field reference manual for immediately getting started with your Leica Viva Series equipment. The manual explains what you can find in your container, how everything fits together and how to get started on the basic applications.

Quick references to specific topics

Topic	Refer to
What's in my container?	Chapter 1.1
How does the equipment all fit together?	Chapter 1.2
What is this first screen I see when I turn on my instrument?	Chapter 2.1
How do I get to the Main Menu?	Chapter 2.1
How do I select things and move around the screens?	Chapter 2.2
What are wizards?	Chapter 2.2

Topic	Refer to
How do I get started with jobs and codelists?	Chapter 3
How to use the applications?	Chapter 4



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.

Service	Description
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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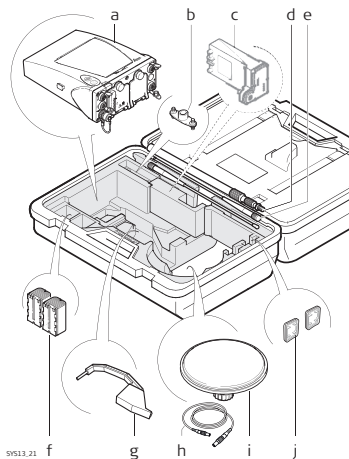
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1 Equipment

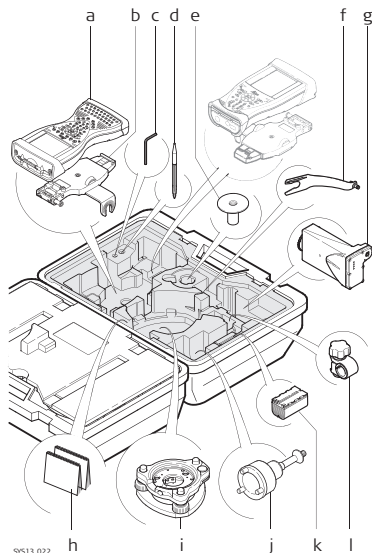
1.1 Container Contents

Container for GS10 instrument and accessories part 1 of 2

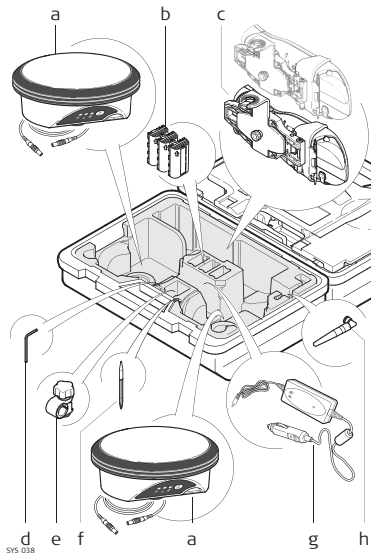


- a) GS10 instrument
- b) Single/double arm for antennas of devices
- c) GFU device such as radio
- d) Antennas of device
- e) GAD32 telescopic rod
- f) GEB221 batteries
- g) Height hook
- h) Cables
- i) Antenna and GAD31 adapter
- j) SD cards

**Container for GS10
instrument and
accessories part 2
of 2**

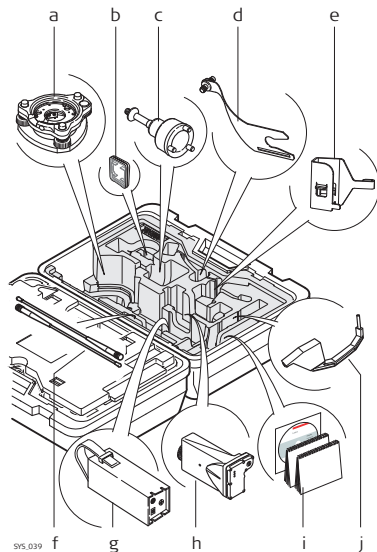


**Container for
GS08plus/GS12
instrument and
accessories 1/2**



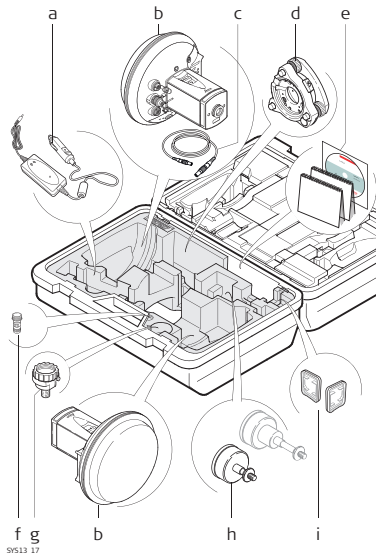
- a) GS08plus/GS12 GNSS antenna and cable
- b) GEB211/GEB212 batteries
- c) CS field controller with CGR radio cap and GHT62 holder for CS field controller on pole
- d) Allen key
- e) GHT63 clamp
- f) Supplied stylus
- g) GDC221 car adapter
- h) GAT21/GAT22 antenna

**Container for
GS08plus/GS12
instrument and
accessories 2/2**



- a) Tribrach
- b) SD card/CompactFlash card
- c) GRT146 carrier
- d) GAD33 arm 15 cm
- e) GHT58 tripod bracket for GFU housing
- f) Antennas of device
- g) GEB171 battery
- h) GFU device such as radio
- i) Manual & DVD
- j) Height hook

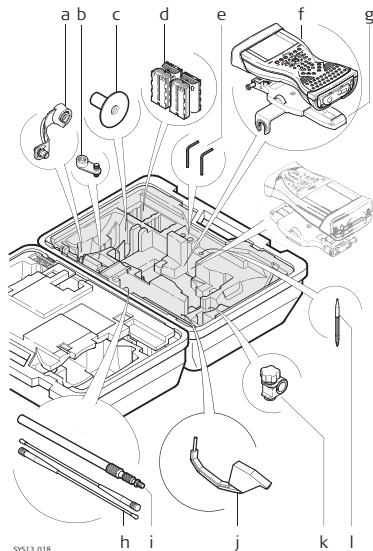
**Container for GS15
instrument and
accessories part 1
of 2**



- a) GDC221 car adapter
- b) GS15 instrument
- c) Cables
- d) Tribrach
- e) Manuals and DVD
- f) TNC QN-adapter
- g) GAD31 adapter
- h) GRT247 carrier
- i) SD cards

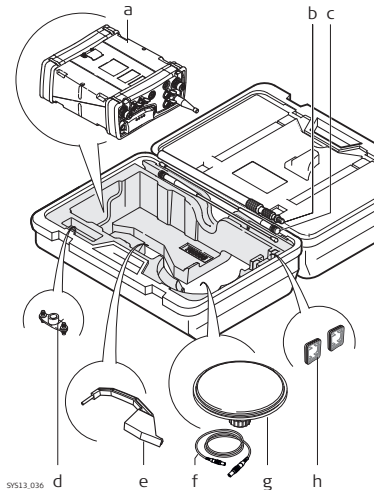
SVS13.17

**Container for GS15
instrument and
accessories part 2
of 2**



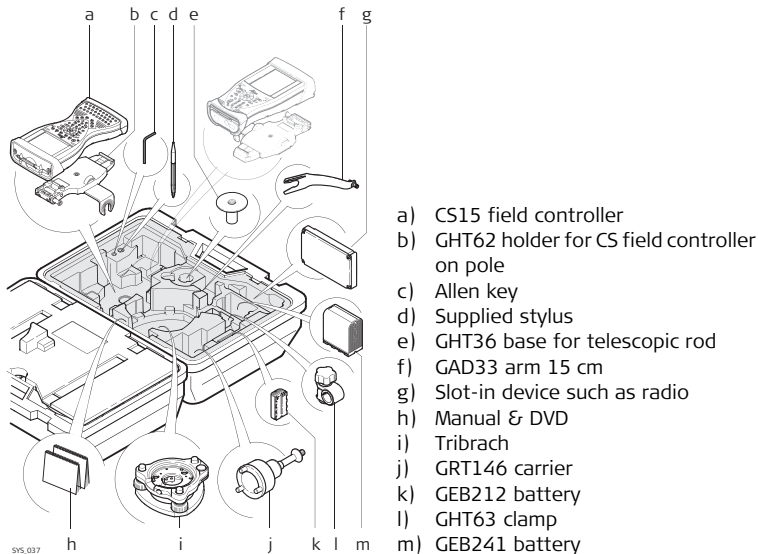
- a) GAD108 arm
- b) GAD34 arm 3 cm
- c) GHT36 base for telescopic rod
- d) GEB211/GEB212 batteries
- e) Allen key
- f) CS field controller
- g) GHT62 holder for CS field controller on pole
- h) Antennas of device
- i) GAD32 telescopic rod
- j) Height hook
- k) GHT63 clamp
- l) Supplied stylus

**Container for GS25
instrument and
accessories part 1
of 2**

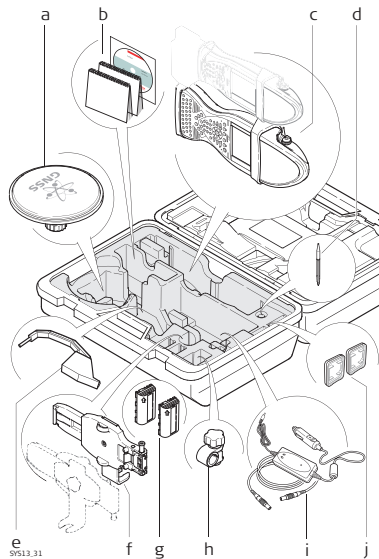


- a) GS25 instrument
- b) Antennas of device
- c) GAD32 telescopic rod
- d) Single/double arm for antennas of devices
- e) Height hook
- f) Cables
- g) Antenna and GAD31 adapter
- h) SD cards

**Container for GS25
instrument and
accessories part 2
of 2**

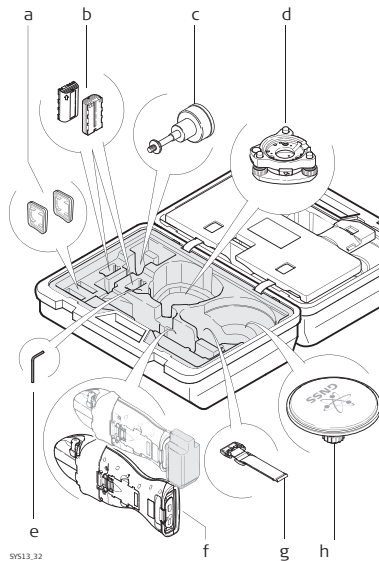


**Container for Viva
Uno instrument
and accessories
part 1 of 2**

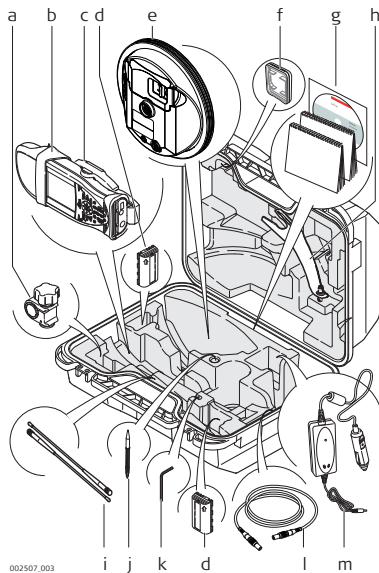


- a) Antenna and GAD31 adapter
- b) Manual & DVD
- c) CS field controller with GS GNSS antenna cap
- d) Supplied stylus
- e) Height hook
- f) GHT62 holder for CS field controller on pole
- g) GEB211 batteries
- h) GHT63 clamp
- i) GDC221 car adapter
- j) SD cards/CompactFlash cards

**Container for Viva
Uno instrument
and accessories
part 2 of 2**



**Container for
GS08plus and
accessories**



- a) GHT63 clamp
- b) CS10 field controller with CGR10 radio and GAT21/GAT22 antenna
- c) GHT62 holder for CS10 field controller on pole
- d) GEB211/GEB212 batteries
- e) GS08plus antenna
- f) SD card/CompactFlash card
- g) Manual & DVD
- h) GAD33 arm 15 cm
- i) Antennas of device
- j) Supplied stylus
- k) Allen key
- l) Cable
- m) GDC221 car adapter

1.2

Setting up as a Post-Processing Base

Use

The equipment setups described following are to be used for static operations over markers.

Description

The instrument can be programmed with the CS field controller before use which can then be omitted from the setup.



- GNSS antenna/GS08plus instrument/GS12 instrument/GS15 instrument is mounted directly using screw fitting. If using stub and adapter, procedures can vary slightly.
 - When using the adapter and carrier, ensure that the GNSS antenna/GS08plus instrument/GS12 instrument/GS15 instrument and the adapter assembly slide down the full length of the carrier stub. An incorrectly mounted GNSS antenna/GS08plus instrument/GS12 instrument/GS15 instrument will have a direct effect on the results.
 - GNSS antennas are AS05 or AS10. Procedures/setup can vary if AR10, AR25 or AT504 GG is used.
-

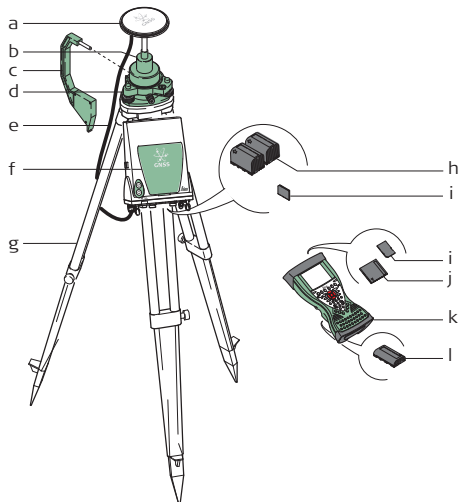


If the instrument is left in the container during use in high temperatures, the lid should be left open. Refer to the User Manual for operating and storage temperatures.



Use an external battery such as GEB171 to ensure operation for a full day.

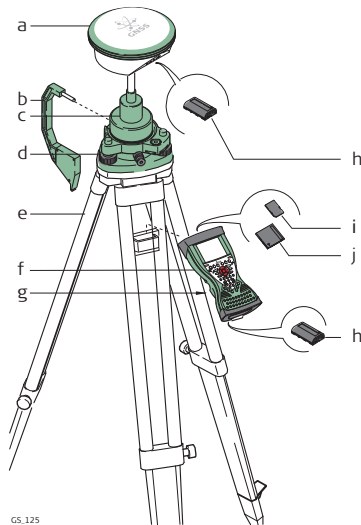
Equipment setup - GS10



GS_107

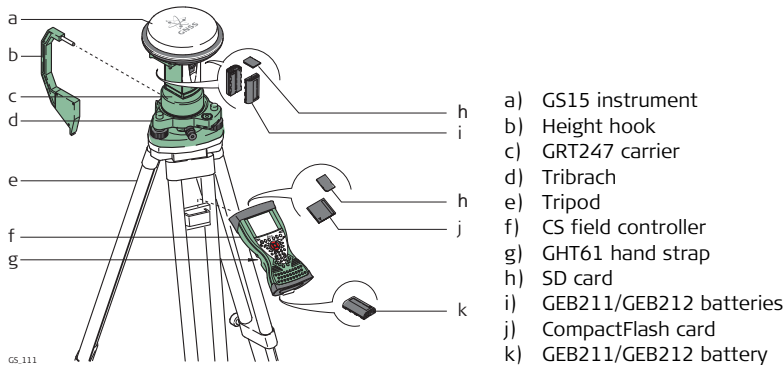
- a) GNSS antenna AS05/AS10
- b) GRT146 carrier
- c) Height hook
- d) Tribrach
- e) 2.8 m antenna cable
- f) GS10 instrument
- g) Tripod
- h) GEB221 batteries
- i) SD card
- j) CompactFlash card
- k) CS field controller
- l) GEB211/GEB212 battery

Equipment setup - GS08plus/GS12

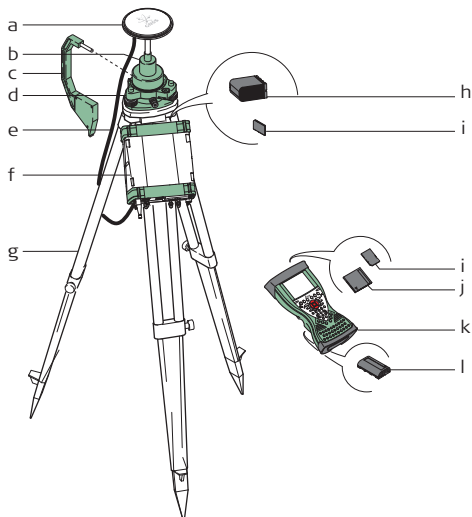


- a) GS08plus/GS12 instrument
- b) Height hook
- c) GRT146 carrier
- d) Tribrach
- e) Tripod
- f) CS field controller
(GS08plus only with CS10
field controller)
- g) GHT61 hand strap
- h) GEB211/GEB212 battery
- i) SD card
- j) CompactFlash card

Equipment setup - GS15



Equipment setup - GS25




GS25_012

- a) GNSS antenna AS05/AS10
- b) GRT146 carrier
- c) Height hook
- d) Tribrach
- e) 2.8 m antenna cable
- f) GS25 instrument
- g) Tripod
- h) GEB241 battery
- i) SD card
- j) CompactFlash card
- k) CS field controller
- l) GEB211/GEB212 battery

Equipment setup
step-by-step

Step	Description	
1.	Set up the tripod.	
2.	Mount and level the tribrach on the tripod.	
3.	Ensure that the tribrach is over the marker.	
4.	Place and lock the carrier in the tribrach.	
	GS10/GS25	GS08plus/GS12/GS15
5.	Screw the GNSS antenna onto the carrier.	Insert the SD card (only GS15) and the batteries into the GS08plus/GS12/GS15.
6.	Check that the tribrach is still level.	Screw the GS08plus/GS12/GS15 onto the carrier.
7.	Insert the batteries into the instrument.	Check that the tribrach is still level.
8.	Insert the SD card into the instrument.	Insert the SD card or CompactFlash card and the battery into the CS field controller.
9.	Connect the instrument to the GNSS antenna using the antenna cable and port ANT on the instrument.	-

Step	Description	
10.	Switch on the CS field controller and connect it to the instrument if necessary.  Mandatory for the GS08plus/GS12 and optional for the GS10/GS15/GS25.	
11.	To hang the instrument on the tripod leg, use the hook on the rear of the unit. Or place the instrument in the container.	To hang the CS field controller on the tripod leg, use the hook on the hand strap. Refer to the CS10/CS15 User Manual.
12.	Insert the height hook into the carrier.	
13.	Measure the antenna height using the height hook.	
14.	Press the ON/OFF button on the instrument for at least 2 s (GS25: 3 s) to switch on the instrument .	

1.3

Setting up as a Real-Time Base

Use

The equipment setups described following are to be used for real-time base stations with the need of optimal radio coverage. Raw observation data can also be collected for post-processing.

Description

The GS10/GS25 instrument clips to the tripod leg. Connections are made to the GNSS and radio antenna. The radio antenna is mounted on the antenna arm which clips to the GNSS antenna. The GS10/GS15/GS25 instrument can be programmed with the CS field controller before use which can then be omitted from the setup.

The GS10/GS25 instrument can be used as a DGPS base station, if fitted with the DGPS option, and as a real-time base station.

The connection between GS15 and CS field controller is made via Bluetooth.



- GNSS antenna/GS08plus instrument/GS12 instrument/GS15 instrument is mounted directly using screw fitting. If using stub and adapter, procedures can vary slightly.
- When using the adapter and carrier, ensure that the GNSS antenna/GS08plus instrument/GS12 instrument/GS15 instrument and the adapter assembly slide down the full length of the carrier stub. An incorrectly mounted GNSS antenna/GS08plus instrument/GS12 instrument/GS15 instrument will have a direct effect on the results.

- Standard radio is used throughout the instructions. Digital cellular phones can also be used but the setup can differ slightly.
- GNSS antennas are AS05 or AS10. Procedures/setup can vary if AR10, AR25 or AT504 GG is used.



If the instrument is left in the container during use in high temperatures, the lid should be left open. Refer to the User Manual for operating and storage temperatures.

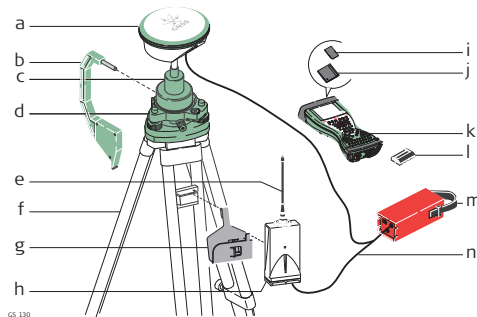


Use an external battery such as GEB171 to ensure operation for a full day.



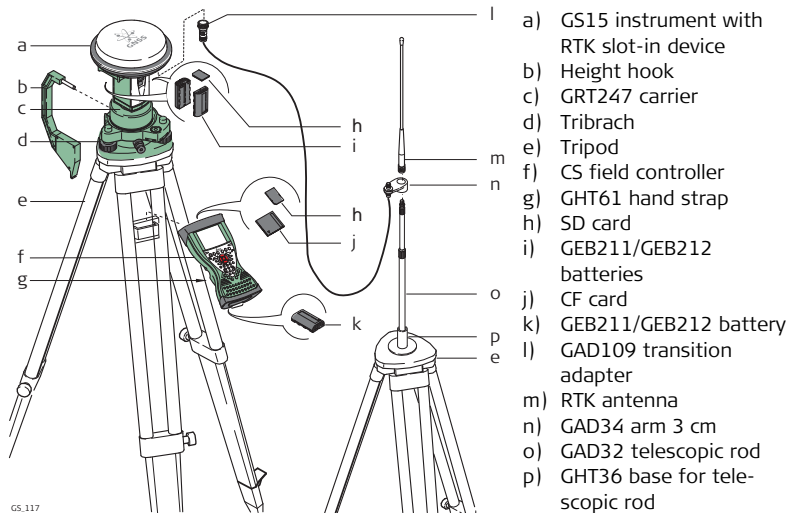
- a) Radio antenna
- b) GAD33 arm 15 cm
- c) GNSS antenna AS05/AS10
- d) Height hook
- e) GRT146 carrier
- f) Tribrach
- g) 1.2 m antenna cable
(instrument/GNSS antenna)
- h) Tripod
- i) GS10 instrument
- j) Radio in housing
- k) 1.2 m antenna cable
(radio housing/radio antenna)
- l) GEB221 batteries
- m) SD card
- n) CompactFlash card
- o) CS field controller
- p) GEB211/GEB212 battery

Equipment setup - GS08plus/GS12

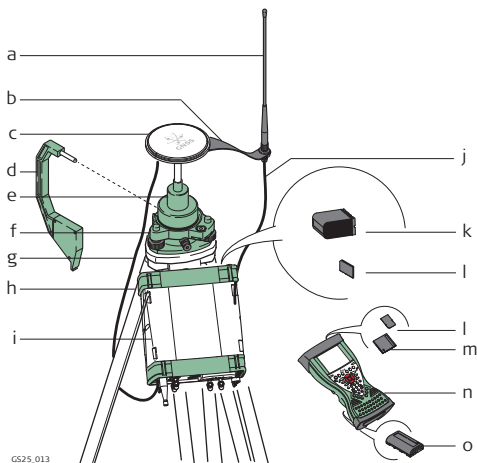


- a) GS08plus/GS12 instrument
- b) Height hook
- c) GRT146 carrier
- d) Tribrach
- e) Antenna for device
- f) Tripod
- g) GHT58 tripod bracket
- h) GFU radio modem
- i) CS field controller
(GS08plus only with CS10
field controller)
- j) GEB211 / GEB212 battery
- k) SD card
- l) CompactFlash card
- m) GEB171 external battery
- n) GEV205 Y-cable

Equipment setup - GS15



Equipment setup - GS25



GS25_013

- a) Radio antenna
- b) GAD33 arm 15 cm
- c) GNSS antenna AS05/AS10
- d) Height hook
- e) GRT146 carrier
- f) Tribrach
- g) 1.2 m antenna cable (instrument/GNSS antenna)
- h) Tripod
- i) GS25 instrument
- j) 1.2 m antenna cable (radio housing/radio antenna)
- k) GEB241 battery
- l) SD card
- m) CompactFlash card
- n) CS field controller
- o) GEB211/GEB212 battery

Equipment setup
step-by-step

Step	Description		
1.	Set up the tripod.		
2.	Mount and level the tribrach on the tripod.		
3.	Ensure that the tribrach is over the marker.		
4.	Place and lock the carrier in the tribrach.		
	GS10/GS25	GS08plus/GS12	GS15
5.	Screw the GNSS antenna onto the carrier.	Screw the GS08plus/GS12 onto the carrier.	Insert the SD card and the batteries into the GS15.
6.	Check that the tribrach is still level.		Press the ON/OFF button on the instrument for at least 2 s to switch on the instrument.
7.	Insert the SD card and the batteries into the instrument.	Hang the external battery onto a tripod leg.	Screw the GS15 onto the carrier.

Step	Description		
8.	Connect the instrument to the GNSS antenna using the antenna cable and port ANT on the instrument.	Hang the tripod bracket onto a tripod leg and attach the radio housing onto the tripod bracket.	Check that the tribrach is still level.
9.	Connect the CS field controller to the instrument if necessary.	Connect the GEV205 cable to the GS08plus/GS12, to the external battery and to the radio housing.	Insert the SD card or CompactFlash card and the battery into the CS field controller.
10.	To hang the instrument on the tripod leg, use the hook on the rear of the unit. Or place the instrument in the container.	Insert the SD card or CompactFlash card and the battery into the CS field controller.	Connect the CS field controller to the instrument if necessary.

Step	Description		
11.	Insert the height hook into the carrier.	Connect the CS field controller to the instrument if necessary.	To hang the CS field controller on the tripod leg, use the hook on the hand strap. Refer to the CS10/CS15 User Manual.
12.	Measure the antenna height using the height hook.	To hang the CS field controller on the tripod leg, use the hook on the hand strap. Refer to the CS10/CS15 User Manual.	Insert the height hook into the carrier.
13.	Clip the antenna arm to the GNSS antenna.	Insert the height hook into the carrier.	Measure the antenna height using the height hook.
14.	Screw the radio antenna onto the antenna arm.	Measure the antenna height using the height hook.	Press the ON/OFF button on the instrument for at least 2 s to switch on the instrument.

Step	Description		
15.	<p>GS10 Attach the radio in its housing to port P2 or P3 on the instrument.</p> <p>GS25 Insert the slot-in radio into port P3 on the instrument.</p>	Press the ON/OFF button on the instrument for at least 2 s to switch on the instrument.	-
16.	Connect the radio antenna to the radio using the second 1.2 m antenna cable.	-	-
17.	Press the ON/OFF button on the instrument for at least 2 s (GS25: 3 s) to switch on the instrument.	-	-

1.4

Setting up as a Real-Time Rover

Use

The following equipment setups are to be used for real-time rover with extended periods of use in the field.

Description

The radio attaches to the instrument (GS10) or is inserted into the instrument (GS25) and is placed in the backpack. Connections are made to the GNSS antenna, radio antenna and CS field controller. The cables coming from the backpack can be disconnected when an obstacle such as a fence has to be crossed.

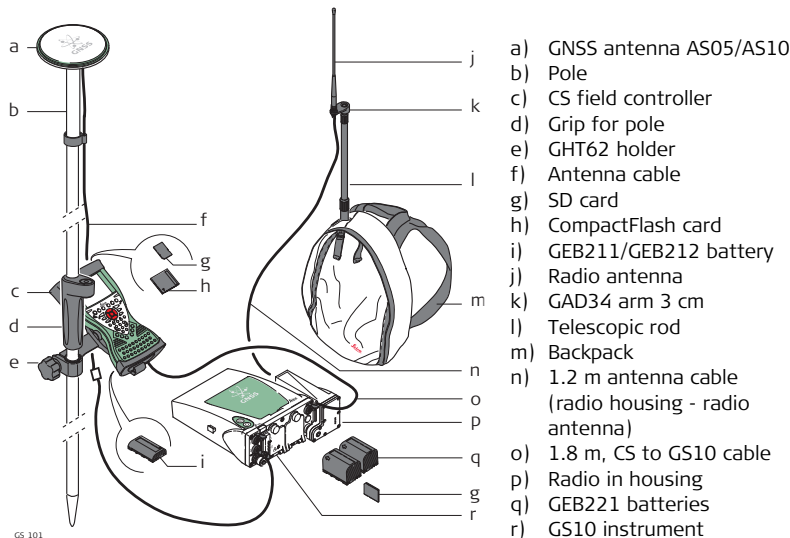
The CS field controller is fixed to the pole with the GHT62. Connection between the GS12/GS15/GS08plus instrument and the CS field controller is made through Bluetooth.



- GNSS antenna/GS12 instrument/GS15/GS08plus instrument is mounted directly using screw fitting. If using stub and adapter, procedures can vary slightly.
- When using the pole with stub, ensure that the GNSS antenna/GS12 instrument/GS15/GS08plus instrument and the screw-to-stub adapter slide down the full length of the stub before tightening the locking ring. An incorrectly mounted GNSS antenna/GS12 instrument/GS15/GS08plus instrument will have a direct effect on the results.
- Aluminium poles are used. They can be replaced with their carbon fibre equivalent without any change to these instructions.

- Standard radio is used throughout the instructions. Digital cellular phones can also be used but the setup can differ slightly.
 - GNSS antennas are AS05 or AS10. Procedures/setup can vary if AR10, AR25 or AT504 GG is used.
-

Equipment setup - GS10

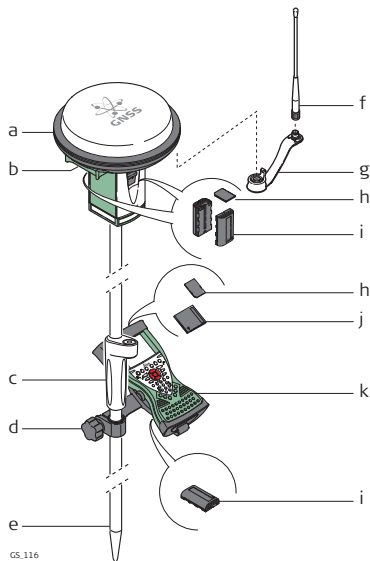


Viva GNSS, Equipment



- a) GS12 GNSS antenna
- b) CGR15 radio
- c) Grip for pole
- d) GHT62 holder
- e) Pole
- f) GEB211/GEB212 battery
- g) SD card
- h) CompactFlash card
- i) CS field controller

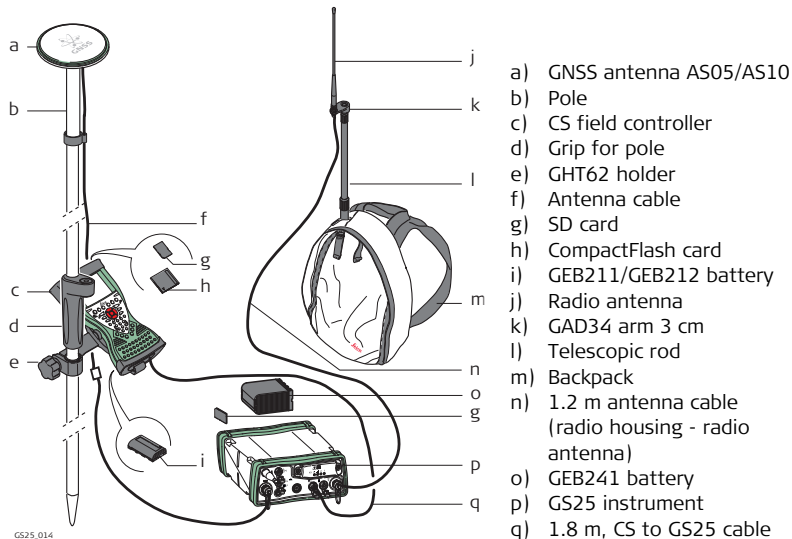
Equipment setup - GS15



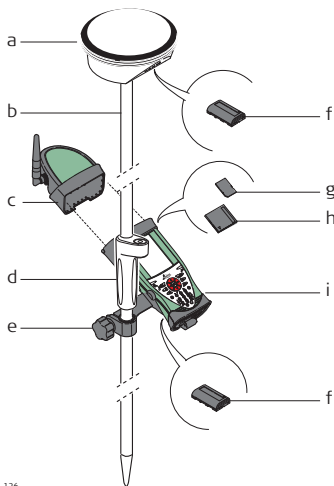
GS_116

- a) GS15 instrument
- b) RTK slot-in device
- c) Grip for pole
- d) GHT62 holder
- e) Pole
- f) RTK antenna
- g) GAD108 arm
- h) SD card
- i) GEB211/GEB212 batteries
- j) CompactFlash card
- k) CS field controller

Equipment setup - GS25




Equipment setup - GS08plus



GS_126

- a) GS08plus instrument
- b) Pole
- c) CGR10 radio
- d) Grip for pole
- e) GHT62 holder
- f) GEB211/GEB212 battery
- g) SD card
- h) CompactFlash card
- i) CS10 field controller

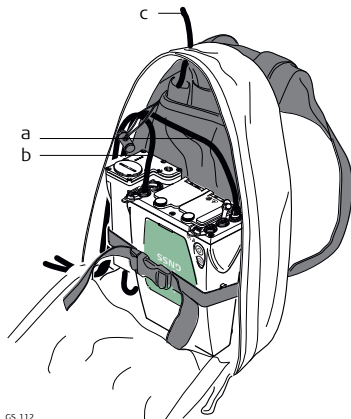
Equipment setup step-by-step

Step	Description
1.	Attach the GHT62 holder to the pole. Refer to "1.7 Fixing the CS to a Holder and Pole".
2.	Insert the SD card or CompactFlash card and the battery into the CS field controller.
3.	 For real-time setup with radio (GS12/GS15): Attach the CGR radio to the CS field controller. Refer to the CS10/CS15 User Manual.
4.	Clip the CS field controller into the holder and lock it by pushing the locking pin into the locked position.
5.	Press ON/OFF button on the CS field controller to switch on.
	Proceed with step 6. for GS10/GS25 and with step 25. for GS12/GS15/GS08plus .
6.	Screw the GNSS antenna to the top of the pole.
7.	Insert the SD card and the batteries into the instrument.
8.	GS10 Attach the radio in its housing to port P2 or P3 on the instrument. GS25 Insert the slot-in radio into port P3 on the instrument.

Step	Description
9.	Place the instrument in the backpack with the top side facing outwards and the instrument front panel to the top.
10.	Fasten the strap around the instrument.
11.	Push the telescopic rod through the slit in the top of the backpack. Ensure that it is located in the sleeve inside the backpack and push it all the way to the bottom.
12.	Adjust the height of the telescopic rod to suit.
13.	Screw the radio antenna arm onto the telescopic rod.
14.	Connect the first 1.2 m antenna cable to the radio antenna.
15.	Pass the cable through the opening in the top of the backpack and down underneath the instrument.
16.	Connect the first 1.2 m antenna cable to the radio.
17.	Connect the 1.6 m antenna cable to port ANT on the instrument.
18.	Pass the 1.6 m antenna cable through a cable brake and down through the opening in the bottom corner of the backpack flap. Refer to "Position of cables in the backpack".
19.	Draw the required amount of cable out of the backpack and tighten the cable brake.

Step	Description
20.	Connect one end of the second 1.2 m antenna cable to the loose end of the 1.6 m antenna cable and the other end to the GNSS antenna.
21.	Connect the 1.8 m, CS to GS cable to the CS field controller.
22.	Pass the 1.8 m, CS to GS cable through the opening in the bottom corner of the backpack flap and up through a cable brake. Refer to "Position of cables in the backpack".
23.	Plug it into port P1 on the instrument.
24.	Press ON/OFF button on the instrument to switch on.
	GS12/GS15/GS08plus.
25.	Insert the SD card (only GS15) and the batteries into the GS12/GS15/GS08plus.
26.	Press ON/OFF button on the GS12/GS15/GS08plus to switch on.
27.	Screw the GS12/GS15/GS08plus to the top of the pole.
28.	CS field controller and GS12/GS15/GS08plus are connected via Bluetooth.

Position of cables in the backpack



GS_112

- a) 1.6 m antenna cable
- b) 1.8 m cable to connect CS field controller and GS instrument
- c) 1.2 m antenna cable to connect radio housing and radio antenna



Refer to "1.6 Using the Backpack" for advice on using the backpack.

1.5

Setting up Viva Uno

Use

The equipment setups described following are to be used for static operations over markers or for rover with extended periods of use in the field.

Description

The Viva Uno instrument consists of the CS field controller (CS10/CS15) and the GS GNSS antenna cap (GS05/GS06) attached to the CS field controller. The CS field controller with the GS GNSS antenna cap attached, clips to the tripod leg. Connections are made to the external GNSS antenna. The CS field controller with the GS GNSS antenna cap attached is fixed to the pole with the GHT62. The setup can be used as a DGPS rover, if fitted with the DGPS option.



- GNSS antenna is mounted directly using screw fitting. If using stub and adapter, procedures can vary slightly.
 - When using the adapter and carrier, ensure that the GNSS antenna and the adapter assembly slide down the full length of the carrier stub. An incorrectly mounted GNSS antenna will have a direct effect on the results.
 - GNSS antenna is AS05.
-

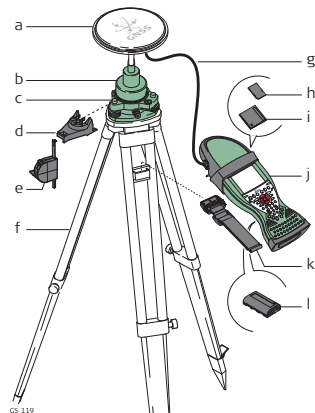


If the instrument is left in the container during use in high temperatures, the lid should be left open. Refer to the CS10/CS15 User Manual for operating and storage temperatures.




It is always recommended to use the external GNSS antenna (AS05) to optimise the reception of satellite signals.

Viva Uno tripod setup

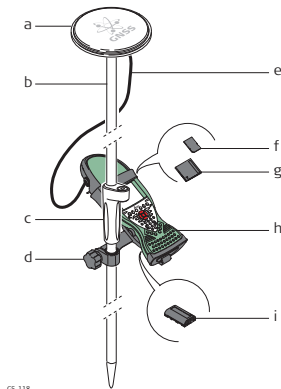


- a) GNSS antenna AS05
- b) GRT146 carrier
- c) Tribrach
- d) GHT196 tribrach bracket for height meter
- e) GHM007 instrument height meter
- f) Tripod
- g) 1.2 m antenna cable
- h) SD card
- i) CompactFlash card
- j) Viva Uno instrument (CS field controller with GNSS cap)
- k) GHT61 hand strap
- l) GEB211/GEB212 battery

Step	Description
1.	Set up the tripod.
2.	Mount and level the tribrach on the tripod.
3.	Ensure that the tribrach is over the marker.
4.	Place and lock the carrier in the tribrach.
5.	Screw the GNSS antenna onto the carrier.
6.	Check that the tribrach is still level.
7.	Insert the SD card or CompactFlash card and the battery into the CS field controller.
8.	Attach the GS GNSS antenna cap to CS field controller. Refer to the CS10/CS15 User Manual.
9.	<p>Connect the antenna cable to the external GNSS antenna and to the GS GNSS antenna cap.</p> <p> When you are using the external GNSS antenna, ensure that you selected the correct Rover antenna (AS05 Tripod GHM).</p>
10.	To hang the instrument on the tripod leg, use the hand strap on the rear of the CS field controller.
11.	Attach the tribrach bracket to the carrier and insert the instrument height meter into the tribrach bracket.


Step	Description
12.	Measure the antenna height using the instrument height meter.
13.	Press the ON/OFF button on the CS field controller for at least 2s to switch on the CS field controller.

Viva Uno rover setup



GS_118

- a) GNSS antenna AS05
- b) Pole
- c) Grip for pole
- d) GHT62 holder
- e) 1.2 m antenna cable
- f) SD card
- g) CompactFlash card
- h) Viva Uno instrument (CS field controller with GS GNSS cap)
- i) GEB211/GEB212 battery

Step	Description
1.	Attach the GHT62 holder to the pole. Refer to "1.7 Fixing the CS to a Holder and Pole".
2.	Insert the SD card or CompactFlash card and the battery into the CS field controller.
3.	Attach the GS GNSS antenna cap to CS field controller. Refer to the CS10/CS15 User Manual.
4.	Clip the CS field controller into the holder and lock it by pushing the locking pin into the locked position.
5.	Screw the GNSS antenna to the top of the pole.
6.	Adjust the height of the telescopic rod to suit.
7.	<p>Connect the antenna cable to the external GNSS antenna and to the GS GNSS antenna cap.</p> <p> When you are using the external GNSS antenna, ensure that you selected the correct Rover antenna (AS05 Tripod GHM).</p>
8.	Press ON/OFF button on the CS field controller to switch on.

1.6

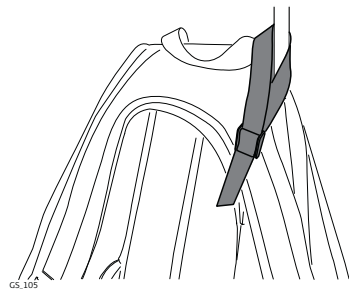
Using the Backpack

Use

The backpack is used for various applications. The applications are:

- Post-processed kinematic, pole and backpack.
 - Real-time rover, pole and backpack.
-

Antenna pole strap



Ensures that the antenna pole does not sway around and remains as upright as possible.

Pass the strap around the pole and fasten using the clip as shown in the diagram.

Hip belt



GS_102

The hip belt

- transfers most of the weight from the shoulders to the hips when properly adjusted.
- contains velcro attachments through which cables can be passed.

Internal net pouch



GS_103

The internal net pouch is designed for

- carrying an AS05/AS10 antenna when not in use.
- storing coiled cables.
- carrying a non-standard radio.
- carrying spare batteries.
- carrying sandwiches.

Use in high temperatures

In high temperatures, it is desirable to increase air flow around the instrument. Therefore the backpack can be kept half or even fully open when in use.



GS_104

To half open the backpack:

- 1) Open the backpack halfway.
- 2) Tuck the flap inside.
- 3) Secure it with the velcro pad.



GS_106

To open the backpack completely:

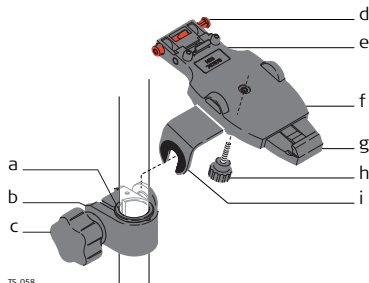
- 1) Open the backpack completely.
- 2) Secure it with the velcro pad.
- 3) Tuck the flap under the instrument.

1.7

Fixing the CS to a Holder and Pole

Components of the GHT62 holder

The GHT62 holder consists of some components, as shown in the diagram.



TS_058



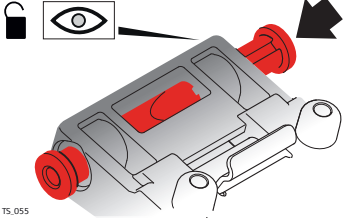
GHT63 clamp

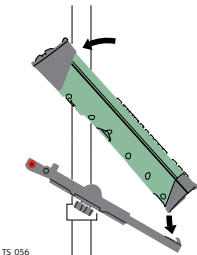
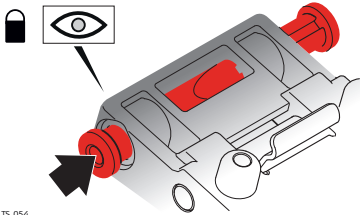
- a) Plastic sleeve
- b) Pole clamp
- c) Clamp bolt

GHT62 holder

- d) Locking pin
- e) Top clip
- f) Mounting plate (extendable)
- g) Bottom clip
- h) Tightening screw
- i) Mounting arm

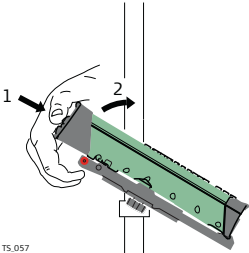
Fixing the CS field controller and GHT62 to a pole step-by-step

Step	Description
	If you use the CS15 field controller, extend the mounting plate of the holder first.
	For an aluminium pole, fit the plastic sleeve to the pole clamp.
1.	Insert the pole into the clamp hole.
2.	Attach the holder to the clamp using the clamp bolt.
3.	Adjust the angle and the height of the holder on the pole to a comfortable position.
4.	Tighten the clamp with the clamp bolt.
5.	<p>Before the CS field controller is placed onto the mounting plate, ensure that the locking pin is put into the unlocked position. To unlock the locking pin, push the locking pin to the left.</p> 
6.	Hold the CS field controller above the holder and lower the end of the CS field controller into the mounting plate.

Step	Description
7.	<p data-bbox="474 153 1084 280">Apply slight pressure in a downward direction and then lower the top part of the CS field controller until the unit is clicked into the holder. The guides of the mounting plate aid in this action.</p>  <p data-bbox="1113 474 1150 486">TS_056</p>
8.	<p data-bbox="474 505 866 695">After the CS field controller is placed onto the mounting plate, ensure that the locking pin is put into the locked position. To lock the locking pin, push the locking pin to the right.</p>  <p data-bbox="895 787 931 799">TS_054</p>

**Detaching the CS
from a pole step-
by-step**

Step	Description
1.	Unlock the locking pin by pushing the locking pin to the left of the mounting plate.
2.	Place palm over the top of the CS until fingers grip the bar of the holder underneath.
3.	Push from the top of the CS toward the bar of the holder.
4.	While in this position, lift the top of the CS from the holder.

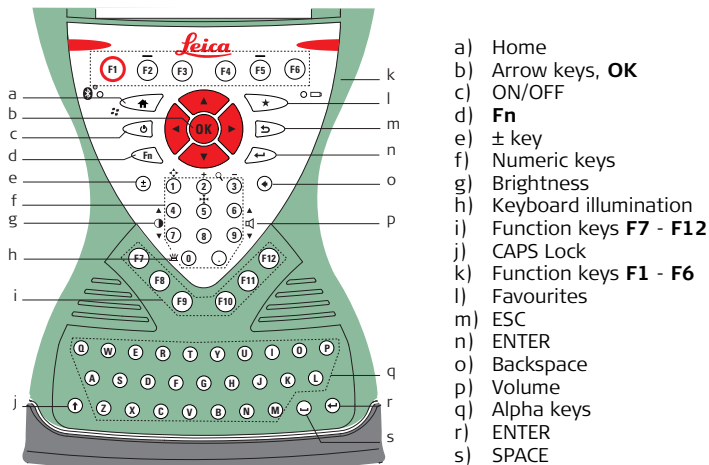


TS_057

2 SmartWorx Viva and Principles

2.1 SmartWorx Viva

Keyboard display
CS15



Start using SmartWorx Viva



- Turn on your GS GNSS or TPS instrument.
- Turn on your CS field controller and start SmartWorx Viva.



For information about wizards refer to "Wizards".

2.1.1

Screen

Screen - CS15 field controller



SYS13_025

- a) Icons
- b) Title
- c) Screen area
- d) Message line
- e) Softkeys
- f) ESC
- g) Fn
- h) CAPS
- i) Time

Elements

Element	Description
Time	The current local time is shown.
Title	Name of the screen is shown.
Screen area	The working area of the screen.
Message line	Messages are shown for 10 s.

Element	Description
Icons	Shows status information of the instrument. Refer to "2.1.2 Icons". Can be used with touch screen.
ESC	Can be used with touch screen. Same functionality as the fixed key ESC. The last operation will be undone.
Entry mode	The caps mode for upper case letters is active. The caps mode is activated and deactivated by pressing the CAPS key.
Fn	Switches between the first and second level of function keys.
Softkeys	Commands can be ran using F1-F6 keys (only applicable for CS15 field controller). The commands assigned to the softkeys are screen-dependent. Can be used directly with touch screen.







Common softkeys







The softkeys following are used commonly in the Leica SmartWorx Viva software across all applications.

Softkey	Function Key	Description
OK	(F1)	To select the highlighted option and to continue with the subsequent screen.

Softkey	Function Key	Description
Page	(F6)	To change to another page on the current screen.
Help	Fn (F1)	To open the Leica SmartWorx Viva online help.
Home	Fn (F2)	To move the focus to the top of the list shown in the current screen.
End	Fn (F3)	To move the focus to the bottom of the list shown in the current screen.
Quit	Fn (F6)	To exit the current application and return to the screen from where the application was accessed.

Key combinations

Key	Function
 + 	Hold Fn while pressing 4 . Increase the screen brightness.
 + 	Hold Fn while pressing 7 . Decrease the screen brightness.
 + 	Hold Fn while pressing 6 . Increase the volume for acoustic warning signals, beeps and keypresses on the CS field controller.

Key	Function
 + 	Hold Fn while pressing 9 . Decrease the volume for acoustic warning signals, beeps and keypresses on the CS field controller.
 + 	Hold Fn while pressing 0 . If keyboard illumination is already off: Turns on keyboard illumination. If keyboard illumination is already on: Turns off keyboard illumination.
 + 	Hold Fn while pressing . . Take a screenshot of the current SmartWorx Viva screen. Refer to "Taking a screenshot".

2.1.2

Icons

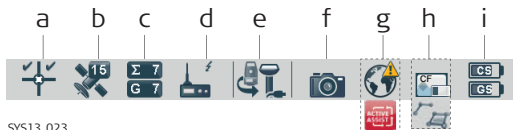
Description



The screen icons display the status information of the instrument.






The icons provide information related to basic instrument functions. The icons that appear depend upon which instrument is used and the current instrument configuration.






Icon bar - GNSS Mode








- | | |
|---|---|
| a) GNSS position status | f) Camera |
| b) Number of visible satellites | g) Internet online status (CS field controller), Active Assist service or Leica Exchange service |
| c) Number of satellites contributing to position solution | h) Memory storage (SD card/Compact-Flash card/USB stick/internal memory) or Line/area/auto points |
| d) Real-time device and real-time status | i) Battery level (field controller/instrument) |
| e) Current active instrument | |





Icons

Icon	Description
Position status 	Displays the status of the current position. As soon as this icon becomes visible the instrument is in a stage where practical operation can commence.
Number of visible satellites 	Displays the number of theoretically visible satellites above the configured cut-off angle according to the current almanac.
Contributing satellites 	Displays the number of satellites that are contributing to the currently computed position solution.  The number of contributing satellites can differ from the number of visible satellites. This difference can be because satellites cannot be viewed, or because the observations to these satellites are considered too noisy to be used.
Real-time device 	Displays the real-time device configured to be used.

Icon	Description
<p>Real-time status</p> 	<p>Displays the status of the real-time device configured to be used.</p>
<p>Current active instrument</p> 	<p>Displays the instruments that are currently configured and active. When more than one instrument is configured, the instrument at the front of the icon is the active instrument.</p>
<p>Camera</p> 	<p>Select this icon to begin the camera function.</p>
<p>Internet online status</p> 	<p>Displays the Internet online status of the CS field controller.</p>
<p>Leica Exchange service</p> 	<p>Displayed when the CS field controller is connected to the Leica Exchange service.</p>

Icon	Description
Active Assist service 	Displayed when the CS field controller is connected to the Active Assist service.
Memory storage 	Displays the status of the internal memory or data storage device.
Data management 	Select this icon to open the data management pages for Points , Lines or Areas . If there are open lines or areas, a  symbol will appear in the icon.
Battery 	Displays the status and location of the battery.

TPS specific icons

Icon	Description
Automatic aiming 	Displays the current automatic aiming or PowerSearch settings.
Prism 	Displays the selected prism.
Measure mode 	Displays the selected measurement mode. The red laser icon will display when the red laser is active.
Compensator level and Instrument face I or II 	Displays the compensator is off or out of range icons, or the instrument face I or II icon.

2.1.3

Main Menu

Main Menu



OK

To select the highlighted option and to continue with the subsequent screen.

Map

To open **Tap Map**.




Fn Mode


To switch between GPS and TPS modes

Fn Exit

To close Leica SmartWorx Viva software.

Main Menu functions

Main Menu function	Description
<div>1</div> 	Go to Work! <ul style="list-style-type: none">To select and start an application.
<div>2</div> 	Jobs & Data <ul style="list-style-type: none">To manage jobs, data, codelists, GNSS antennas, reflectors and coordinate systems.To export data from a job on the instrument to a file on the memory device in a customised ASCII format or in DXF format.To import ASCII, GSI or DXF data from a file on the memory device to a job on the instrument.To copy points between jobs.
<div>3</div> 	Instrument <ul style="list-style-type: none">To access all configuration parameters related to a survey, the instrument and the interfaces.To view the various instrument status screens.For TS11/TS15: To configure the camera, if available.

Main Menu function	Description
	<p>User</p> <ul style="list-style-type: none">• To format the memory device.• To upload files relevant for the instrument functionality, for example, firmware files, language files and licence keys.• To transfer data between the memory device and a standard and simple FTP server.• To view files on the memory device or the internal memory.• To access all configuration parameters individualising the system and the working style.• For TS11/TS12 Lite/TS15: To check and adjust the compensator, index error and line of sight error.

2.1.4

Leica Favourites

Description

Frequently used settings can be accessed and changed quickly through the **Leica TPS Favourites** and **Leica GPS Favourites** screens. The change is applied immediately and the workflow is not interrupted. The screens display selectable icons for quick check functions or for available settings to change to.

Access

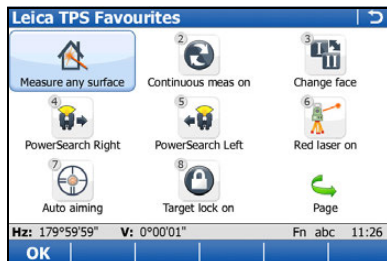
For TPS:

- Tap the target aiming icon or select .

For GPS:

- Tap the position status icon or select .

Leica TPS Favourites





OK

To apply the selected setting or to access the selected function.

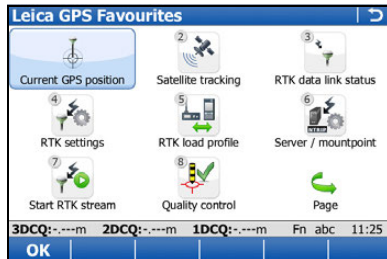
Fn Quit

To exit the screen.

To change to one of the displayed settings, or access a quick check function, do one of the following;

- Tap on the icon on the touch screen.
- Highlight a field and press .
- Highlight a field and press .
- Highlight a field and press **OK**.
- Press the number next to the setting or function.

Leica GPS Favourites





OK

To apply the selected setting or to access the selected function.

Fn Quit

To exit the screen.

To change to one of the displayed settings, or access a quick check function, do one of the following;

- Tap on the icon on the touch screen.
 - Highlight a field and press .
 - Highlight a field and press .
 - Highlight a field and press **OK**.
 - Press the number next to the setting or function.
-

2.1.5

Active Assist

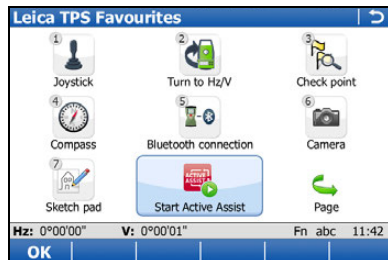
Description

Active Assist is an online support tool that allows Leica technical support to gain remote access to your TS11/TS12 Lite/TS15 instrument or CS10/CS15 field controller.



Valid CCP and Active Assist licences are required to use Active Assist.


Access



Active Assist can only be started from the **Leica TPS Favourites** and **Leica GPS Favourites** screens. Refer to "2.1.4 Leica Favourites".

Using Active Assist step-by-step

Step	Description
1.	Establish a connection to the Internet through a Bluetooth digital cellular phone or the internal 3.5G modem of the CS10/CS15 field controller.
2.	Call your local technical support.

Step	Description
3.	Select Start Active Assist to connect to the Active Assist service.
4.	Quote the equipment number shown on the screen to your supporter.
	Leica technical support has now remote access to your TPS instrument or CS field controller screen.
5.	Select End Active Assist to disconnect from the Active Assist service once the session has finished.

2.1.6

Leica Exchange

Description

Leica Exchange is an online service that allows the data exchange between two users of the service. For example:

- The user in the field sends the daily measured data to the user in the office.
- The user in the field sends a codelist to a second user in the field.


The service is available on your TS11/TS12 Lite/TS15 instrument or CS10/CS15 field controller.

Requirements

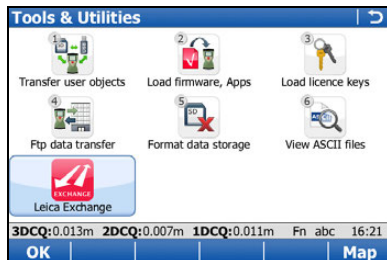
- Valid Leica Exchange subscription
 - SmartWorx Viva 4.0 or higher
 - Leica Exchange licence key loaded on a CS field controller/TS instrument
- AND / OR
- Leica Exchange entitlement ID loaded on a computer with Leica Exchange Office

Creating User name and Password step-by-step

Step	Description
1.	Order a Leica Exchange subscription. You will receive a subscription form.
2.	Take the subscription ID in the subscription form and log in to your myWorld account (https://myworld.leica-geosystems.com).
3.	Navigate to myTrustedServices.

Step	Description
4.	On the My Trusted Services tab, select Add Service and type in the subscription ID.
5.	The Leica Exchange Service is shown in the My Trusted Services tab. Once the Leica Exchange Service is registered, users can be assigned to the service on the My Users tab.
6.	<p>Click the Add button to define a new user and to assign services to the user. For each user:</p> <ul style="list-style-type: none"> • Enter contact information • Define a unique user name • Assign a password <p>The user name and password are needed each time you access the Leica Exchange Service. The Leica Exchange Service can be accessed from SmartWorx Viva in the field or using Leica Exchange Office PC software.</p>
	After registering the subscription ID in your myWorld account, the subscription usage statistic is fully accessible. The total quota is shown and the consumed and remaining GB are displayed in total GB and GB/month.




Access




Leica Exchange can be started from the **Tools & Utilities** menu or directly by pressing a Hot key (only for CS15 field controller).

If a user is currently logged in, the **Leica Exchange Main Menu** screen is accessed. If no user is currently logged in, the **Leica Exchange** screen is accessed.



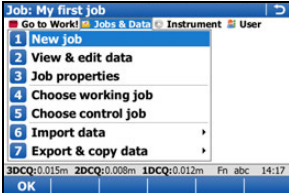

Using Leica Exchange service step-by-step

Step	Description
1.	Establish a connection to the Internet through a Bluetooth digital cellular phone or the internal 3.5G modem of the CS10/CS15 field controller.
2.	Log in to the Leica Exchange service.  User name and password must be typed in each time the Leica Exchange service is accessed.  A license agreement has to be accepted, when you log in to Leica Exchange for the first time.
	The Leica Exchange Main Menu is accessed.


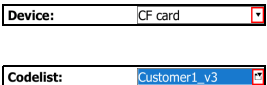
Step	Description
3.	<p>Select the option you want to perform:</p> <ul style="list-style-type: none"> • Send data.. • Get data.. • Transfer status.. • Config.. • Connection status.. • Exit & stay logged in • Exit & log out
4.	<p>Select Exit & log out to disconnect from the Leica Exchange service to return to the Main Menu.</p> <p> If you only want to return to the Main Menu, but remain logged in, select Exit & stay logged in.</p>

2.2 Operating Principles

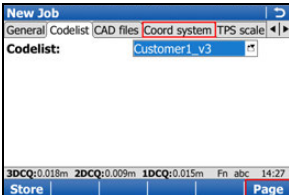
Accessing a menu option

Description	Illustration
<p>There are three ways to access a menu option.</p> <ol style="list-style-type: none">1 Using the touchscreen functionality. Tap on the menu item using the stylus provided.2 Using the up and down navigation arrows. Move the focus to the menu item. Select OK, or press the OK  button, or the ENTER  button.3 Using the numbered keypad. Select the number that corresponds to the menu item. For example, press 1 from the Jobs & Data menu to access the New job screen.	 



Accessing a selectable list

Description	Illustration
<p>A downward arrow beside a field, indicates there are more choices available in a selectable list.</p> <p>A box and a downward arrow beside a field, indicates that there are more choices and functionality available in a separate screen.</p> <p>To access the list or screen use the touchscreen functionality to tap on the icon, or move the focus to the field and press the ENTER  button.</p>	

Accessing a page within a screen

Description	Illustration
<p>To access another page within a screen, either:</p> <ul style="list-style-type: none">• Tap on the page tab for the page to be displayed, or• Select Page until the page is displayed	

Exiting a screen without making a change

Description	Illustration
<p>To exit a screen without making a change, either:</p> <ul style="list-style-type: none"> • Tap on the return icon, or • Press the ESC  button 	



Wizards





The wizards following are available to make your daily work easier. Each of them lead you through a series of steps, performing tasks in a specific sequence. For detailed descriptions of the wizards, please refer to the Leica Viva Series Technical Reference Manual.

Wizard	Description
SmartWorx StartUp Wizard	Define the behaviour of your instrument for a general start-up.
RTK rover wizard	Set up your real-time rover.
GS connection wizard	Connect your CS field controller with your GS instrument.
TPS connect wizard	Connect your CS field controller with your TPS instrument.





Wizard	Description
Internet wizard	Connect your CS field controller with the Internet.
CS connection wizard	Connect your CS field controller with your TS11/TS12 Lite/TS15 instrument.
Working style wizard	Configure the parameters and functions of SmartWorx Viva so that it suits to your preferred method of working and save the settings in a working style.
Check & Adjust Wizard	For TS11/TS12 Lite/TS15. Check and adjust the instrument in the field by running through specific measurement procedures.

Taking an image using the instruments camera

Step	Description
1.	<p>Tap the camera icon  in the icon bar to access the Capture Image with Camera screen.</p> <p> For a CS field controller, which is configured to use a TS11/TS15 instrument with a wide-angle camera, the Capture Image with Camera screen has two pages (TS wide-angle and CS camera). Select which camera to use by clicking the corresponding page or using Page to toggle between both pages.</p>
2.	Aim the camera to the desired target.

Step	Description
3.	Check the view at the display.
4.	Press OK or click Capture to take the picture.  Capture changes to Store .
5.	The image can be overlaid with a sketch. Click the  icon in the toolbar to activate sketching. The  icon is displayed. Additional icons are displayed to control the line weight, style and colour of any lines you "sketch" on top of your image. The image cannot be moved.
6.	Press Store to save the image. A confirmation window opens. The image can be linked to a point, line or area.
7.	<ul style="list-style-type: none">• Press Last to link the image with the last stored point and save it.• Press Select to link the image with any point, line or area of the current working job and save it.• Press No to save the image in the current working job without linking it to a point, line or area.  After the image has been stored you automatically return to the Capture Image with Camera screen.

Taking a screenshot

Step	Description
1.	<p>Press the hotkey configured to User - Screenshot capture or hold Fn while pressing '.'. A screenshot of the current SmartWorx Viva screen is created and displayed in the Image Notes screen.</p> <p> The hotkey functionality is not available on the CS10 field controller.</p>
2.	<p>The screenshot can be overlaid with a sketch. Click the  icon in the toolbar to activate sketching. The  icon is displayed. Additional icons are displayed to control the line weight, style and colour of any lines you "sketch" on top of your image. The image cannot be moved.</p>
3.	<p>Press Store to save the screenshot. A confirmation window opens. The screenshot can be linked to a point, line or area.</p>
4.	<ul style="list-style-type: none">• Press Last to link the screenshot with the last stored point and save it.• Press Select to link the screenshot with any point, line or area of the current working job and save it.• Press No to save the screenshot in the current working job without linking it to a point, line or area. <p> After the screenshot has been stored you automatically return to the screen where the screenshot has been taken from.</p>

2.3

Webserver

Description

The Web server is a web-based tool to view the status of and configure the GNSS instruments. The Web server application is integrated into the GS firmware and cannot be deleted.


Access




The Web server from the GNSS instruments can be accessed using the web browser of a Windows device. The Windows device has to be connected first to the GNSS instrument via cable or Bluetooth. Refer to the Leica GS10/GS15 User Manual and the Leica GS25 User Manual.

2.3.1

Home

Description

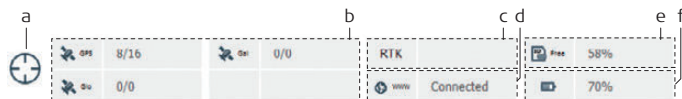
Home function	Description
	Go to Work! <ul style="list-style-type: none">To select and start the Wake-up application. Refer to "2.3.3 Go to Work! - Wake-Up".

Home function	Description
	<p>Current Status</p> <ul style="list-style-type: none"> To view GNSS information of the GS as well as the instrument firmware. Refer to "2.3.4 Current Status".
	<p>Instrument</p> <ul style="list-style-type: none"> To configure settings for the GS. Refer to "2.3.5 Instrument".
	<p>User</p> <ul style="list-style-type: none"> To upload and activate firmware, licence keys and languages. Refer to "2.3.6 User".

2.3.2

Icons

Icon bar



- a) GNSS position status
- b) Number of satellites tracked and available for each satellite system
- c) Real-time device and real-time status
- d) Internet online status
- e) Memory storage (SD card only)
- f) Battery level on GS

2.3.3

Go to Work! - Wake-Up

Description

Wake-up sessions are static point occupations, for which the instrument is preprogrammed with a start time and a duration or end time. The instrument turns itself on at the configured start time and the point occupation begins. The point occupation stops and the point is stored after the preprogrammed duration.

In the **Go to Work! - Wake-Up** menu, the actions following can be performed:

- Create/edit a Wake-up session.
 - Activate/deactivate a Wake-up session.
 - Delete a Wake-up session.
-



A data storage device must be inserted when the instrument wakes up. If no data storage device is fitted or it is damaged, not formatted or full then the session will not be run.

2.3.4

Current Status

Description

In the **Current Status** menu, the statuses following can be viewed:

- Satellite Tracking status
 - Date and time of the various almanacs on the instrument
 - **Sat**, **Elevation**, **Azimuth**, **S/N1** and **S/N2** and **Health** of every satellite
 - Position status
 - **Local time**, **Position latency**, **HDOP**, **VDOP**, **GDOP**, **PDOP**, **Position quality** and **Height quality** (only available if a calculated position is available)
 - Battery/memory/raw data logging status
 - Percentage of remaining power capacity of the internal and/or external battery (if connected)
 - Total/free memory for data storage on the SD card
 - Information about the raw data logging
 - Instrument status
 - Instrument and firmware (e.g. **Serial no.**)
 - Version (e.g. firmware version of the onboard software)
 - Licencing (e.g. availability of additional instrument hardware options)
-

2.3.5

Instrument

Description

In the **Instrument** menu, the actions following can be performed:

- Set **Operating mode** (base or rover), select antenna
 - Configure **Raw data logging** and **Auto logging of points**
 - Configure **Satellite settings**
 - Configure **Coordinate system settings**
 - Define **Time settings**
-

2.3.6

User

Description

In the **User** menu, the actions following can be performed:

- **Load firmware**
 - Upload new firmware on the GS instrument.
 - **Upload option key**
 - Load a licence key to or delete a licence key from the instrument. A licence key activates the application or the protected options or the software maintenance on the instrument. Licence key files use the naming convention L_123456.key, where 123456 is the instrument serial number.
 - **Language management**
 - Select the interface language of the **Web server**. English is always available as the default language of the **Web server** and cannot be deleted.
-

3

Jobs & Data

3.1

Creating a New Job

Creating a job step-by-step

General steps to create your first job in SmartWorx Viva.



Creating your first job

- From the **Main Menu**, select **Jobs & Data** and press **OK**.
- Select **New job** from the **Jobs & Data** menu and press **OK**.

- Enter a name for the job.
- Use **Page** to toggle between the pages to set the proper **Codelist**, **CAD files**, **Coord system**, **TPS scale** and **Averaging**.
- Press **Store** to save the job.



You have finished creating your first job, which is selected as current working job. You will automatically return to the **Main Menu** and are ready to start the next activity.

3.2

Creating a Codelist

Creating a codelist step-by-step

Generals steps to create your first codelist in SmartWorx Viva.



Creating your first codelist

- From the **Main Menu**, select **Jobs & Data** and press **OK**.
- Select **Job properties** from the **Jobs & Data** menu and press **OK**.

The screenshot shows two sequential screens from the Viva GNSS application. The top screen, titled 'Job Properties: My first job', has tabs for 'General', 'Codelist', 'CAD files', 'Coord system', and 'TPS scale'. The 'Codelist' tab is active, showing a 'Codelist:' field with a dropdown menu currently set to '<None>'. Below this is a status bar with '3DCQ:0.011m', '2DCQ:0.006m', '1DCQ:0.009m', 'Fn abc', and '15:59'. At the bottom are buttons for 'Store', 'Data..', and 'Page'. The bottom screen, titled 'New Codelist', has a 'Name:' field with 'User Codelist' entered, a 'Description:' field with 'My 1st codelist', and a 'Creator:' field with 'User'. It also has a status bar with the same coordinates and time '16:00'. At the bottom are buttons for 'OK', 'New..', 'Edit..', 'Delete', and 'More'. The bottom-most screen shows the 'Codes' screen with a 'Codes..' button highlighted.

- Press **Page** to change to the **Codelist** page.
- Tap on the selectable list to open the **Codelists** screen.
- Press **New..** to create a codelist.
- Type in a **Name** (**Description** and **Creator** are optional).
- Press **Codes..** to open the **Codes** screen.

The top screenshot shows the 'New Code' dialog. It has a header 'Codes' and a sub-header 'Code description'. Below this is a table with columns 'Code' and 'Code description'. The table is empty. Below the table is a status bar with '3DCQ:0.011m 2DCQ:0.006m 1DCQ:0.009m Fn abc 16:32'. Below the status bar are buttons 'OK', 'New..', and 'More'. Below the buttons is a section 'New Code' with a sub-header 'Code description'. It has fields for 'Code:', 'Description:', 'Code group:', 'Code type:', and 'Linework:'. The 'Code' field contains 'EL', 'Description' contains 'Light Pole', 'Code group' contains 'Electric', 'Code type' contains 'Point', and 'Linework' contains 'None'. Below these fields is a 'Diameter' field with a value of '-----'. Below the 'Diameter' field is a status bar with '3DCQ:0.011m 2DCQ:0.006m 1DCQ:0.009m Fn abc 16:43'. Below the status bar are buttons 'Store', '+Attrib', and 'More'.

The bottom screenshot shows the 'Codes' list. It has a header 'Codes' and a sub-header 'Code description'. Below this is a table with columns 'Code' and 'Code description'. The table contains one row with 'EL*' in the 'Code' column and 'Light Pole' in the 'Code description' column. Below the table is a status bar with '3DCQ:0.011m 2DCQ:0.006m 1DCQ:0.009m Fn abc 17:18'. Below the status bar are buttons 'OK', 'New..', 'Edit..', 'Delete', and 'More'.

Creating a code

- Press **New..** to create a code.
- Type in a **Code** (EL) and a **Description** (Light Pole), select the **Code group*** (Electric), the **Code type (Point)** and the **Linework (None)** and create an attribute (Diameter).
- Press **Store** to save the new code.
- * The **Code group** has to be created first before it can be selected.
- Press **OK** to return to the **New Codelist** screen.

The screenshot shows two screens from the SmartWorkNiva application. The top screen is 'New Codelist' with fields for Name (User Codelist), Description (My 1st codelist), and Creator (User). Below these fields is a status bar showing 3DCQ:0.011m, 2DCQ:0.006m, 1DCQ:0.009m, Fn abc, and 17:07. The bottom screen is 'Codelists' showing a table with columns Name and Date. The table has one entry: 'User Codelist' with date '31.08.09'. Below the table is another status bar with the same data as the top screen. At the bottom of the application is a menu bar with icons and labels: 'Go to Work!', 'Jobs & Data', 'Instrument', and 'User'. The 'Jobs & Data' icon is highlighted. The status bar at the very bottom shows 3DCQ:0.011m, 2DCQ:0.006m, 1DCQ:0.009m, Fn abc, and 15:26.

New Codelist

Name: User Codelist

Description: My 1st codelist

Creator: User

3DCQ:0.011m 2DCQ:0.006m 1DCQ:0.009m Fn abc 17:07

Store Codes...

Codelists

Name	Date
<None>	----
User Codelist	31.08.09

3DCQ:0.011m 2DCQ:0.006m 1DCQ:0.009m Fn abc 17:25

OK New.. Edit.. Delete More

Job: My first job

1 **Go to Work!**
Survey & stake pts
Start base station

2 **Jobs & Data**
Point management
Import & export

3 **Instrument**
Settings & status
Connections

4 **User**
Software settings
Screen & audio

SmartWorkNiva

3DCQ:0.011m 2DCQ:0.006m 1DCQ:0.009m Fn abc 15:26

OK Map

Storing the codelist

- Press **Store** to save your codelist. You will automatically return to the **Codelists** screen.
- Press **OK** to return to **Job Properties**:, **Codelist** page.
- Press **Store** to save your job and to return to the **Main Menu**.



You have created your first codelist, with a code and a code group and attached it to your current working job.

3.3

Importing ASCII Data into a Job

Objective

Importing point objects into the working job by using the **Import ASCII data** functionality.



At least one ASCII file with any file extension must be stored in the \DATA directory of the internal memory or data storage device.

Import ASCII data step-by-step



Starting the ASCII Importer

- From the **Main Menu**, select **Jobs & Data**.
- In the **Jobs & Data** menu, select **Import data**, then **Import ASCII data** and access the **Import ASCII Data** screen.

Import ASCII Data

From: CF card

Data type to import: ASCII data

From file: Point objects.txt

To job: My first job

Header lines: None

3DCQ:0.012m 2DCQ:0.007m 1DCQ:0.010m Fn abc 14:42

OK **Config..** View

Configuration

Delimiter: Space

Point ID position: 1

Easting position: 2

Northing position: 3

Height position: 4

Code position: None

☒ Multi Spaces

3DCQ:0.013m 2DCQ:0.008m 1DCQ:0.011m Fn abc 14:42

OK **Default**

Import ASCII Data

From: CF card

Data type to import: ASCII data

From file: Point objects.txt

To job: My first job

Header lines: None

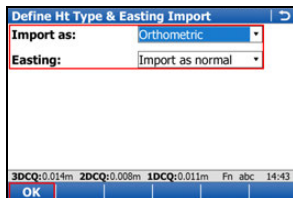
3DCQ:0.013m 2DCQ:0.008m 1DCQ:0.011m Fn abc 14:43

Help **Hts..** Quit

- Select the data storage device, the data type (**ASCII data**), the file to be imported, the working job into which the data has to be imported and define whether header lines have to be considered.
- Enter the **Configuration** screen (**Config..**).

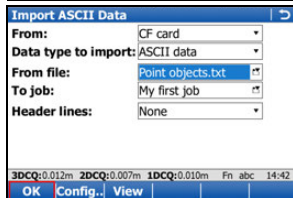
Configuring the ASCII Importer

- Select the **Delimiter**.
 - Define the position for Point ID, Easting, Northing, Height and Code (if applicable).
 - Confirm the configuration settings and return to the **Import ASCII Data** screen (**OK**).
-
- Enter the **Define Ht Type & Easting Import** screen (**Fn Hts..**).



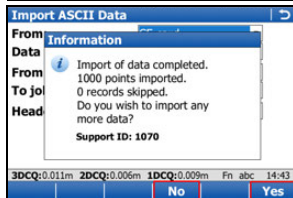
Define height type and Easting import

- Define how heights (**Orthometric** or **Ellipsoidal**) and how the Easting is imported.
- Confirm the configuration settings and return to the **Import ASCII Data** screen (**OK**).



Importing the ASCII data

- Import the ASCII data to the working job (**OK**).



- After importing the ASCII data to the working job, complete the import (**No**) and return to the **Main Menu** or import another ASCII data (**Yes**).



You have completed importing ASCII data into your current working job.

Getting started

Working Style Wizard
Choose the working style to use.

Working Style: Customer 1
Description: Customer 1
Creator: Default

3DCQ:0.016m 2DCQ:0.009m 1DCQ:0.013m Fn abc 14:20

Choose working job (CF card)

Name	Date
Customer 1	31.08.09
Default	15.07.09

3DCQ:0.020m 2DCQ:0.011m 1DCQ:0.017m Fn abc 14:18

OK New.. Edit.. Delete Data.. SD card

- Check that the correct working style (see **User, Working style wizard**) is being used.
- Check that the correct working job (see **Jobs & Data, Choose working job**) is being used.

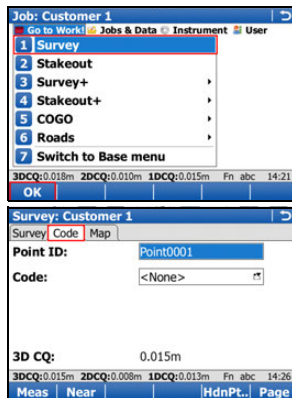
4.1

Survey

Objective

Surveying point objects (fire hydrants, light poles etc.) by choosing codes manually.

Surveying point objects step-by-step



Starting Survey

- In the **Go to Work!** menu, select **Survey** and access Survey.
- Switch to the **Code** page.

Select Code

Code	Code description
TSP	Traffic Sign Pt
TSB	Traffic Sign Brd
TSPT	Traffic Sgn Post
EL*	Light Pole
EP*	Electric Pole
ELP*	Light and Pole
ET*	
EUN*	Unimproved ground
SV*	Stop Valve

3DCQ:0.017m 2DCQ:0.010m 1DCQ:0.014m Fn abc 14:19

ABCDE | FGHIJ | KLMNO | PQRST | UVWXY | Z*?/

Selecting the code

- Highlight **Code** and select the code EL (for Electric Light pole). To select the code EL, toggle to the code or type in the letters to open the drop-down list and search for the code.



Enter the search text in the same case as the code (for example capitals).

Survey: Customer 1

Survey Code Map

Point ID: Point0001

Code: EL

Diameter: ----

3D CQ: 0.020m

3DCQ:0.020m 2DCQ:0.011m 1DCQ:0.016m Fn abc 14:21

Meas Near HdnPt.. Page

Measuring the point object

- When the code is selected, press **Meas** to measure the point object.

Enter Mandatory Attribute

Code: EL

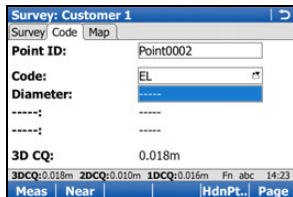
Description: Light Pole

Diameter: 300

3DCQ:0.021m 2DCQ:0.011m 1DCQ:0.017m Fn abc 14:22

OK Last Default

- After the measurement has been stopped the **Enter Mandatory Attribute** screen will appear since the attribute **Diameter** is mandatory and is currently blank.
- Enter a diameter of **300** (mm) and press **OK** to store the point.



Survey: Customer 1

Survey Code Map

Point ID: Point0002

Code: EL

Diameter: -----

3D CQ: 0.018m

3DCQ:0.018m 2DCQ:0.010m 1DCQ:0.016m Fn abc 14:23

Meas Near HdnPt.. Page



You have finished measuring your first point object.



Once the point is stored then the code and attribute value that was stored are displayed.

4.2

Stakeout

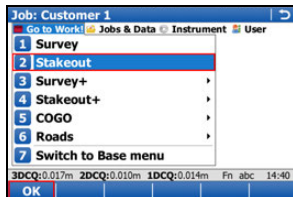
Objective

Staking out point objects. To make your life easier you will define a filter before staking out the point object. The filter will be defined the way that only points with a certain code and those points which have not yet been staked will be available to be staked out.



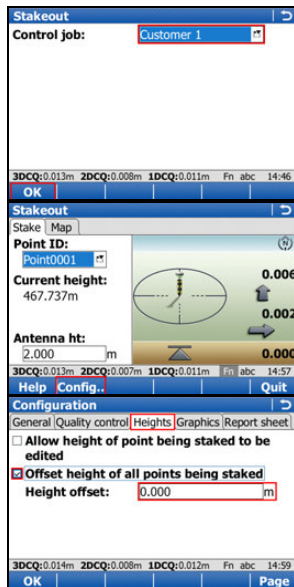
To accelerate the working example, skip the steps regarding the filters and proceed directly with staking out the point object.

Staking out point objects step-by-step



Starting Stakeout

- In the **Go to Work!** menu, select **Stakeout** and access **Stakeout**.



Stakeout

- Select the job which contains your point objects to be staked out.
- Press **OK** to enter the **Stakeout** screen.

Configuring Stakeout

- Press **Fn Config..** to access the **Configuration** screen.
- Configure the following settings:
 - **General** page, **Quality control** page and **Report sheet** page: Leave all settings unchanged.
 - **Heights** page: Check **Offset height of all points being staked** and set **Height offset** to **0.000 m**.



- **Graphics** page: Set **Navigate direction**: Following arrow and **Navigate using**: In/out, left/right.
- Press **OK** to return to the **Stakeout** screen.

Setting up filters

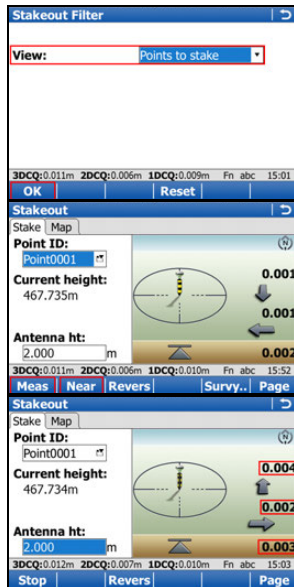
- Tap on the box with the downward arrow right of the Point ID to open the Data screen. All points stored in the control job are shown.
- Press **Fn Filter..** to access **Sorts & Filters** screen.

The screenshot shows the 'Sorts & Filters' screen with the 'Filter by:' dropdown menu open, showing 'Point code' selected. The screen also displays a table of point codes and their activation status.

Code	Activated
TSP	No
TSB	No
TSPT	No
EL	Yes
EP	No
ELP	No
ET	No
SV	No
FP	No

The bottom of the screen shows the 'Sorts & Filters' screen again, with the 'Filter by:' dropdown menu open, showing 'Point code' selected.

- Set **Filter by: Point code**.
- Press **Codes..** to access **Point Code Filter** screen.
- Press **None** to set all codes to No.
- Highlight code **EL** and press **Use** to activate it.
- Press **OK** to return to the **Sorts & Filters** screen.
- Press **Stake** to access **Stakeout Filter** screen.



- Set **View: Points to stake**.
- Press **OK** three times to return to the **Stakeout** screen.

Staking out your first point object

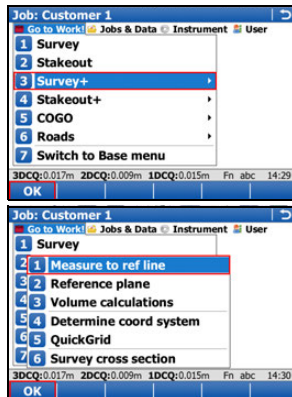
- Which is the closest point to you to stake out first? Press **Near** to select the nearest point.
 - Navigate to the point and press **Meas**.
 - While measuring the point you still can see the differences between the coordinates of the design point and the coordinates of the point you measured.
 - The next point in the list to be staked out is displayed after the point was stored.
- ☞ You finished staking out your first poin0.

4.3 Reference Line

Objective

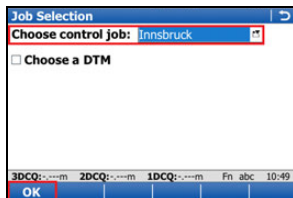
Measuring or staking point objects (fire hydrants, light poles etc.) relative to a line.

Measuring point objects relative to a line step-by-step



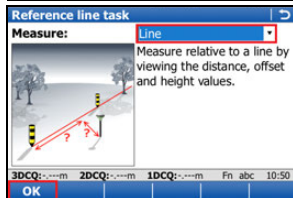
Starting Measure to ref line

- In the **Go to Work!** menu, select **Survey+** and access **Survey+** menu.
- Select **Measure to ref line** and continue (OK).
Staking a reference line can also be accessed under **Go to Work! / Stakeout+ / Stake to ref line**.



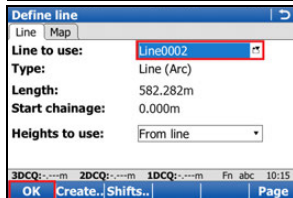
Job Selection

- Select the job which contains the points used to define the line.
- Press **OK** to access **Reference line task** screen.



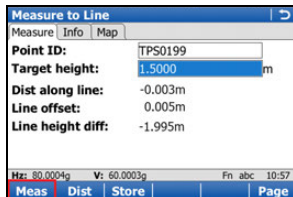
Define the task

- Set **Measure: Line** and continue (**OK**).



Define the line to be used

- Select a line from **Line to use** or press **Create..** to create a line.
- Press **OK** to access **Measure to Line** screen.



Measure the point object relative to the line

- In the **Measure to Line** screen, press **Meas** to measure the point.



You have finished measuring your first point object relative to a line.

Appendix A Working with Memory Devices

A.1 Formatting a Memory Device

General

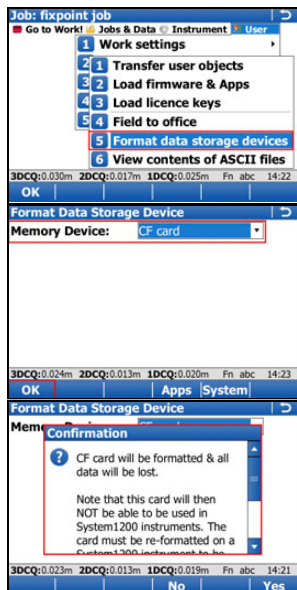
Formatting a memory device before storing data on it, is required if the device is new, or if all data on the device must be deleted.

By activating the format command all data will be lost. Make sure that all important data on the device has been backed up before formatting. If formatting the internal memory, make sure that all important data is first transferred to the computer.

Formatting the memory device will make it incompatible with System 1200 instruments with firmware version 7.60 or earlier. To become usable with System 1200 again, the device would need to be reformatted on a System 1200 instrument.

To exit the screen without formatting the memory device, press the **ESC** key. This returns to the previous screen without running the format command.

Formatting a memory device step-by-step

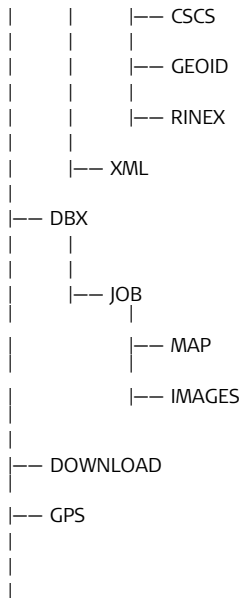


- From the **Main Menu**, select **User\Tools & other utilities\Format memory devices**
- **Memory device:** Select the device to format
- Select **OK** to continue with the formatting.
- Select **Yes** to complete the formatting of the memory device, OR
- Select **No** to cancel formatting of the memory device and return to **Format Memory Device**.
- Once the formatting of the memory device is completed the system returns to the **Main Menu**.

A.2

Directory Structure of the Memory Device

Directory structure	-- CODE	<ul style="list-style-type: none">• Codelists, various files
	-- CONFIG	<ul style="list-style-type: none">• Working style files (*.xfg)
	-- RTK_PROFILE	<ul style="list-style-type: none">• RTK profile files (*.rpr)
	-- SKETCH_TEMPLATE	<ul style="list-style-type: none">• Custom templates (*.jpg) for sketching
	-- USERMANAGEMENT	<ul style="list-style-type: none">• Administration settings files (*.usm)
	-- CONVERT	<ul style="list-style-type: none">• Format files (*.frt)
	-- DATA	<ul style="list-style-type: none">• ASCII (*.txt), DXF (*.dxf), LandXML (*.xml), Terramodel (*.xml), Carlson (*.cl) and Shape files (*.shp, *.shx and *.dbf and all other shape file components) for import/export to/from job• Section files for Carlson (*.sct) and ASCII report files for Terramodel (*.txt) for import to job• Report sheets created from applications
	-- GPS	



- CPCS field files (*.csc)
- Geoid field files (*.gem)
- RINEX files
- Alignment Editor Alignments (*.xml)
- DTM jobs, various files
- Coordinate system file (Trfset.dat)
- Job files for System 1200
- Job files, various files. Jobs are stored in a folder per job.
- Map related files (for example *.mpl), stored in a subfolder per job.
- Image files (*.jpg), stored in a subfolder per job.
- Various files, downloaded by the Ftp data transfer application (*.*)
- Antenna file (List.ant)
- GSM/Modem station list (*.fil)
- Server list (*.fil)

|-- GSI
|
|
|-- SYSTEM

- GSI files (*.gsi)
 - ASCII files for export from job (*.*)
 - Application files (*.axx)
 - Firmware files (*.fw)
 - Language files (*.s*)
 - Licence file (*.key)
 - System files (VivaSystem.zip)
-

Appendix B Uploading System Files

Tips and Tricks

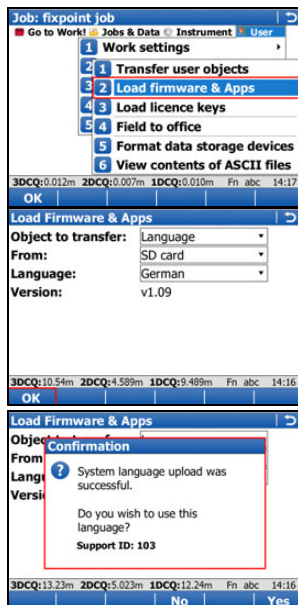
- Uploading objects can take some time. Ensure that the battery is at least 75% full before beginning the upload, and do not remove the battery during the upload process.
- Applications will be installed in English and in any other language that is already loaded onto the instrument. If a new language is loaded after an application has been installed, the application will need to be reinstalled to become available in the new language.
- It is not possible to have more than three language files stored on the instrument. English is always available as the default language and cannot be deleted.



Copy the object to upload into the /SYSTEM directory of the data storage device and insert the device into the instrument.

Firmware files use the extension *.fw, application files use the extension *.axx, and language files use an extension that is individual to each language.

Uploading firm-ware, applications or languages step-by-step



- From the **Main Menu**, select **User\Tools & other utilities\Load firmware & Apps**
- Object to transfer:** Select the type of object to upload
- From:** Select the data storage device where the object is located
- App / Firmware / Language:** Select the file name of the object
- Select **OK** to upload the object onto the instrument.
- The upload process can take some time. A message will appear when the upload is complete.

Appendix C Leica Geo Office

Description


Leica Geo Office (LGO) is an office software consisting of a suite of standard and extended programs for the viewing, exchange and management of data.


Jobs, codelists and other related files can be transferred from the instrument or data storage device to LGO for post-processing.

In LGO, the Data Exchange Manager enables data to be transferred between an instrument and a computer. The Import Raw Data function in LGO, imports the data from the computer or data storage device into an LGO project.

Transferring files to LGO step-by-step

Step	Description
1.	<ul style="list-style-type: none">• If data is located on a data storage device, insert the device into the appropriate slot or port of the computer. Go to step 7.• If data is stored on the CS10/CS15 instrument, connect the instrument to the computer using the docking station or a USB cable. Copy the data to the computer using Microsoft ActiveSync or Windows Mobile Device Centre. Go to step 7..• If data is located on the TPS instrument, connect the instrument to the computer using a USB cable, Bluetooth connection, or an RS232 serial cable. Go to step 2.
2.	Select Tools/Data Exchange Manager to open the Data Exchange Manager window.
3.	<p>Right click in the Data Exchange Manager window and select Settings....</p> <ul style="list-style-type: none">• For a USB connection, ensure that the USB port settings are configured for the instrument type being connected.• For a Bluetooth or RS232 serial cable connection, ensure the instrument interface settings and the computer COM settings are configured correctly. <p>Select OK to close the Setting window.</p>

Step	Description
4.	In the folder directory on the left of the Data Exchange Manager window, open the Serial Ports or USB COM node to which the instrument is connected. Highlight the object to transfer.
5.	In the folder directory on the right, open the My Computer/Files folder location. Select a folder on the computer hard drive where the object can be transferred to and saved.
6.	Drag and drop, or copy and paste, the object from the directory on the left side to the selected folder on the right side. All object-specific files will be copied to the selected folder on the computer hard drive.
7.	To import the files into LGO select Import/Raw Data... or select the  icon from the toolbar.

Step	Description
8.	<p>In the Import Raw Data window, select the type of data to be imported in the Files of type: drop down list. Values are;</p> <ul style="list-style-type: none"> • SmartWorx raw data • GSI (Observations) • GSI (Points only) • Database points (DBX, GeoDB) • LandXML <p> When importing GSI data, click the Settings button to define additional import settings for how the TPS raw data will be imported to a project.</p>
9.	Browse through the folder directory and select the file or folder to import. The file or folder can be on the computer hard drive or on the inserted data storage device.
10.	Select Import to proceed to the Assign window.

Step	Description
11.	<p>In the Assign window, before assigning the data to a project, the following functionality is available:</p> <ul style="list-style-type: none">• Select the TPS tab to preview the raw TPS data. On this page, it is possible to select or deselect which data is assigned to the project.• Select the GPS tab to preview the raw GPS data. On this page, it is possible to select or deselect which data is assigned to the project.• Select the Settings tab to modify the assign settings. The settings available depend on the type of data to be imported.• Select the Backup button to save, if desired, the raw data from a data storage device to the computer hard drive. Select a directory from the browser and select OK to confirm.• Select the Fieldbook button to generate a Fieldbook Report on the jobs to be imported.
12.	<p>To import the data to a project:</p> <ul style="list-style-type: none">• In the General tab, select an existing project from the list. <p>OR</p> <ul style="list-style-type: none">• Create a new project by right clicking and selecting New... from the context menu.
13.	Select the Assign button to import the data into the selected project.

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Leica Geosystems AG, Heerbrugg, Switzerland, has been certified as being equipped with a quality system which meets the International Standards of Quality Management and Quality Systems (ISO standard 9001) and Environmental Management Systems (ISO standard 14001).

Ask your local Leica Geosystems dealer for more information about our TQM program.

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