

- when it has to be **right**



Leica Captivate v8.50

Software Release Notes

Product	Leica Captivate Field Controllers: CS20, CS30, CS35, CC200 Total Stations: TS10, TS13, TS16, TS60, TM60, MS60 GNSS Sensors: GS18 T, GS18 I, GS18
Release date	11 th June 2024
Maintenance date	1 st June 2024
Available in myWorld	Week 24, 2024



Available via: <https://myworld-portal.leica-geosystems.com/>

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1 Leica Captivate v8.50 Release Notes - Introduction

These Release Notes contain important information about new features and bugfixes.

General information	There is a Leica Captivate v8.50 release for the following hardware: <ul style="list-style-type: none">• Field Controllers: CS20, CS30, CS35, CC200• Total Stations: TS10, TS13, TS16, TS60, MS60, TM60• GNSS Sensors: GS18 T, GS18 I, GS18
Customer Care Product (CCP) dates	The Leica Captivate software version 8.50 can be loaded onto all CS Field Controllers, GS18 GNSS Sensors and TS/MS Total Stations with a CCP valid until at least 01.06.2024.
Jobs, Coordinate Systems, Working Styles, RTK Profiles and other objects	All Leica Captivate “objects” (such as Jobs, Coordinate Systems, Working Styles, RTK profiles etc.) created or used within previous Leica Captivate versions can be used in Leica Captivate v8.50

Compatibility between Leica Captivate versions

Compatibility between Leica Captivate versions is guaranteed if the instruments run the same major version.

This means, for example, when using a version 8.x on a Leica Captivate GS Sensor or TS Total Station, the CS20 Controller or CS30/CS35/CC200 Tablet must also run an 8.x version to be compatible.

For the new Leica Captivate v8.50, all Leica Captivate GS Sensors and TS/MS Total Stations must be updated to a version 8.x to be compatible with a CS20 Controller or CS30/CS35/CC200 Tablets running v8.50 and vice versa.

Compatibility between Leica Captivate and SmartWorx Viva versions

The table below shows the compatibility between Leica Captivate and SmartWorx Viva versions.

		CS20, CS3x, CC200			
		Leica Captivate v1.x	...	Leica Captivate v7.x	Leica Captivate v8.x
TS MS GS	All versions prior to SmartWorx Viva v6.0 and higher than v5.60	Fully compatible		Not compatible	Not compatible
	...				
	SmartWorx Viva v8.x	Not compatible		Not compatible	Not compatible
	SmartWorx Viva v9.x	Not compatible		Compatible for Viva TS	Compatible for Viva TS
GS	SmartWorx Viva v11.x	Not compatible		Fully compatible	Not compatible
	SmartWorx Viva v12.x	Not compatible		Not compatible	Fully compatible

Security Update

Due to a security update related to license keys within the firmware it is not possible to downgrade a total station to a lower version once Leica Captivate v8.50 is loaded in the instrument.

2 Leica Captivate - New Software Features

Tools – Regional configurator

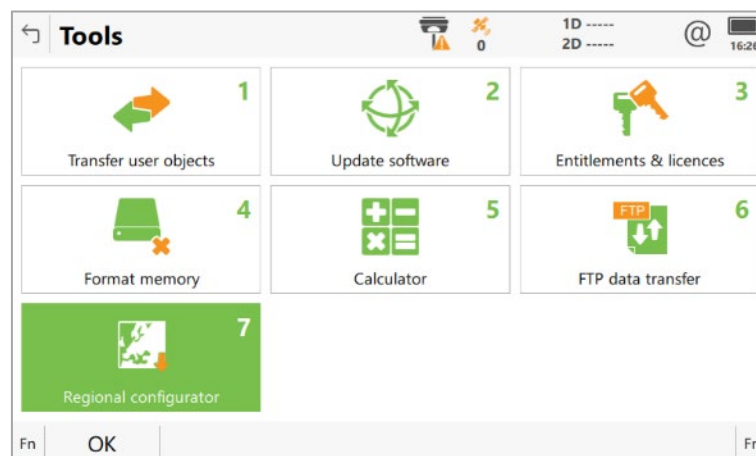


In previous versions of Leica Captivate, the only way to configure and prepare devices with regional-specific files and settings was either during the pre-delivery customisation process, or by transferring the user objects onto the device from a storage device. If, at a later point in time, objects were updated, or the user required additional objects, such as when working on a different project, or in a different region, sourcing these objects and transferring them to the device often meant support was needed.

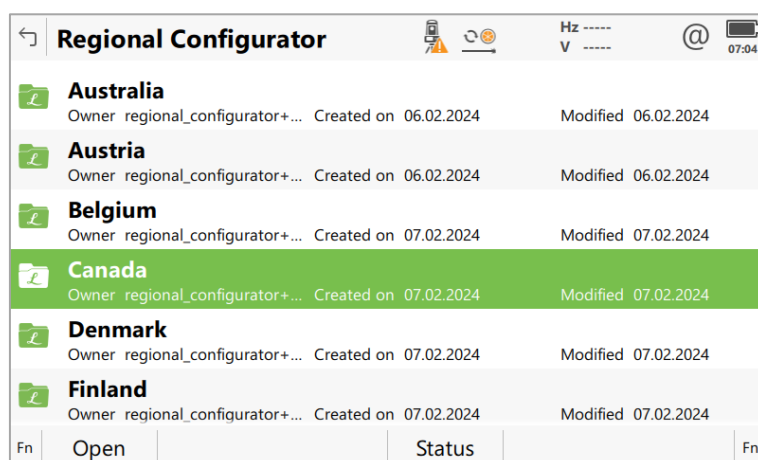
From Leica Captivate v8.50 onwards, a new **Regional configurator** tool allows direct access to all the regional-specific files and settings that have been shared and placed into the designated HxGN GeoCloud storage drive by each region. These can include user objects and resources, such as working styles, RTK profiles, codelists, coordinate systems, stylesheets and many other configuration files and lists.

With an internet connection, the objects within any region can be accessed and downloaded directly to the field device, ready to be used straightaway.

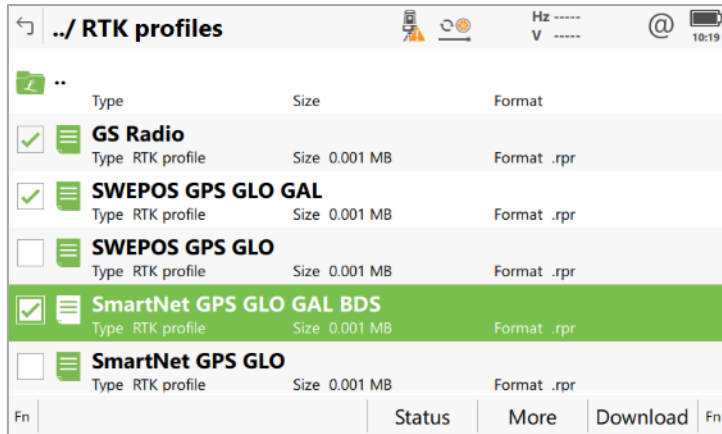
The Regional configurator can be found within the **Tools** panel and can be used without needing a specific license or HxGN GeoCloud account.



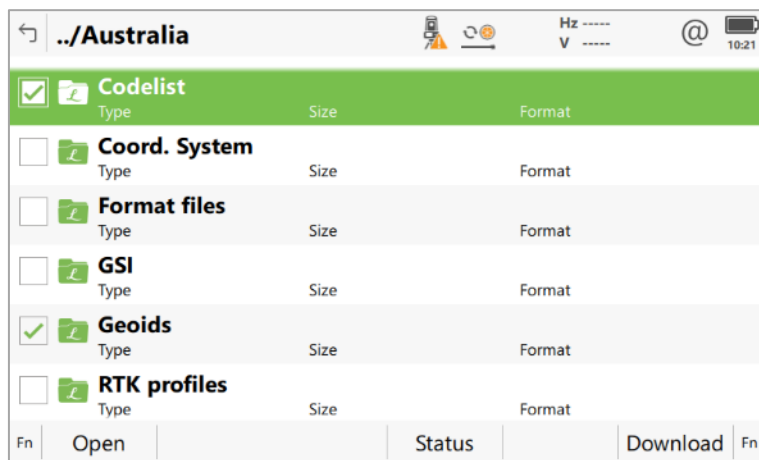
Within the tool, any regions containing downloadable objects are listed as folders. Any region listed can be accessed.



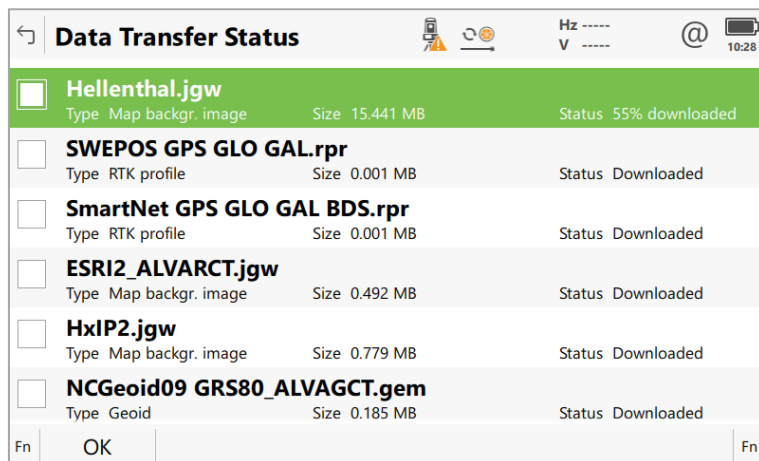
The content of each region can vary and may be organised into sub-folders. The downloadable objects can be navigated to, selected, and downloaded.



Folders can be selected and their entire contents downloaded too.



Once the download has started, the transfer status can be checked:



The **Regional configurator** tool supports and recognises all types of Leica Captivate objects, and automatically places the downloaded objects into the correct location, so that Captivate can directly use them without any further steps required.

This new tool makes it very easy for any user to configure a Captivate field device with region-specific files and settings, ensuring that each device can be kept up to date, and the user has access to all the local objects and configurations, whichever region it is being used in.

3D Viewer - Snapping functionality



In previous versions of Leica Captivate, it was possible to attach reference files, such as CAD or IFC data, to the working job. To be able to use the reference files, for example to stake out or check specific points of interest, the whole object had to first be imported, so that the points could be selected within the database. Importing complex objects could result in many unnecessary points and lines, which made choosing the actual point of interest cumbersome and inefficient.

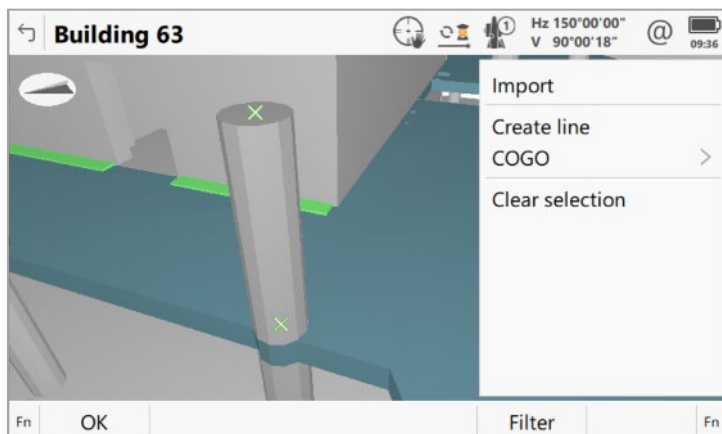
In Leica Captivate v8.50, a new snapping tool has been introduced to allow specific points of interest to be easily extracted from attached reference files. Within the map view, the required snapping tool can be activated from the new selection toolbar. Then, by tapping near to a point of interest on a reference object, a temporary snap marker is automatically created at the correct location.

Using the context menu, any placed snap markers can be imported as points into the database, or specific functions directly performed such as accessing **COGO** or Stake apps. There are two snapping tools, for different types of points of interest:

Snap to end/corner point – allows snapping to the start/ends of lines or line segments, and to the corners of solid objects such as polyface meshes or 3D faces. This makes it easy to create individual points at the corners of polylines, such as building corners within a CAD file, or at the corners of solid objects such as walls within an IFC file.



Snap to arc/circle centre point – allows snapping to the centre point of an arc or the centre point of a circle. This makes it easy to create individual points at the centre of circular objects such as the centre of a column within an IFC file.



Points created with the snapping tool will automatically have the reference data layer information assigned to the Point code, and for IFC data, include the GUID as an annotation.

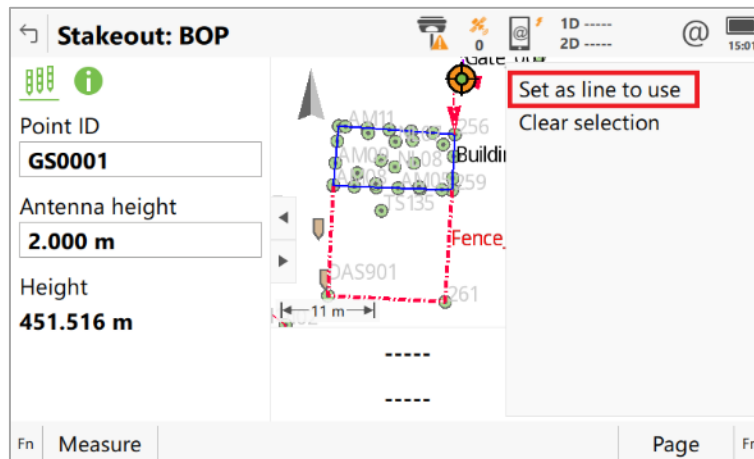
The snapping tool is available in all map views where multiple object selection is possible, which includes the **3D viewer** app, **View & Edit data** and the **Measure** app. It makes working with your reference data far easier and more efficient than ever before, allowing you to be more productive with your staking and checking tasks.

Stake/Measure to line – Selection of a new working line within the app



In previous Leica Captivate versions, within the **Stake** or **Measure to line** app the only way to choose the line to use was in the Define line panel. Once in the Measure or Stakeout panel, to choose a different line to use, it was required to escape back several panels to the Define line panel. When using an AP20 with tilt compensation, this would also mean needing to stop the tilt initialisation.

In Leica Captivate v8.50, the option to choose a different line to use from within the Measure or Stake panel has been introduced. Now, all lines from any active job are shown in the 3D viewer and are selectable. Using the context menu, the option **Set as line to use** can be used to set the selected line to be the new reference line.



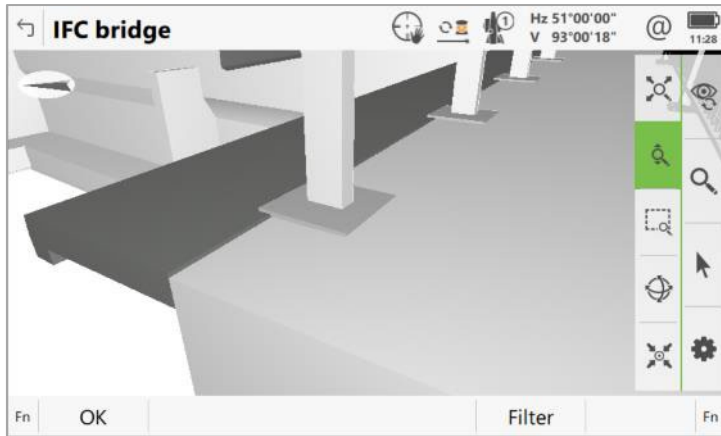
This new option ensures that when needing to change the reference line, the ongoing field task is not interrupted by avoiding the need to change panels or stop the measurement process.

Map view – Minimum zoom distance to an object

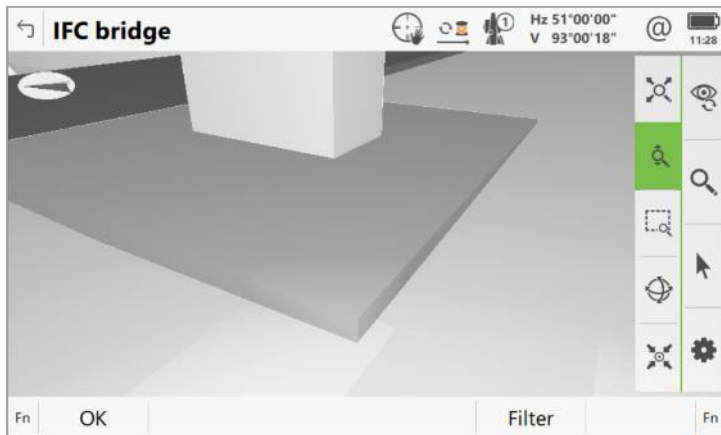


In previous versions of Leica Captivate, when zooming in to an object in the 3D view, the limitation of the minimum zoom distance meant that sometimes, objects could not be viewed in enough detail, especially if they were small or complex.

This limitation could also make it difficult to select the required part of the object to work with. For example, in the image below, the zoom limitation meant that it was not possible to zoom in any closer to the base of the pillar.



From Leica Captivate v8.50 onwards, the minimum zoom distance limitation has been decreased, which allows zooming in much closer to objects. This means that objects can be viewed in more detail, which also makes selecting small or complex objects much easier. The image below shows that the base of the pillar can be zoomed in too much closer than previously.

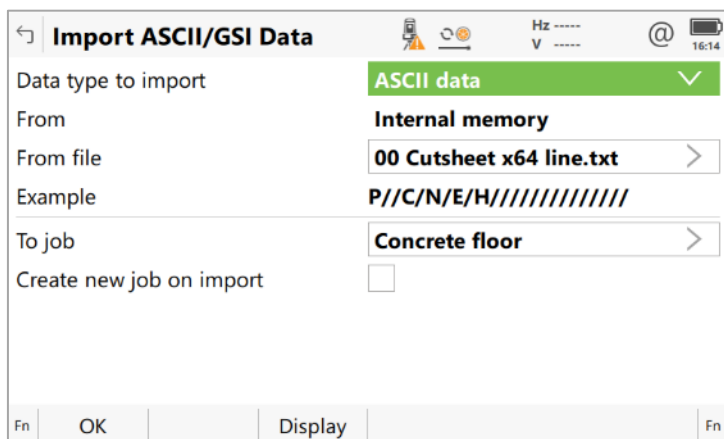


Import ASCII



In previous versions of Leica Captivate, when using the **Import ASCII data** tool, it was not possible to see how the import settings were configured, without going into the settings panel.

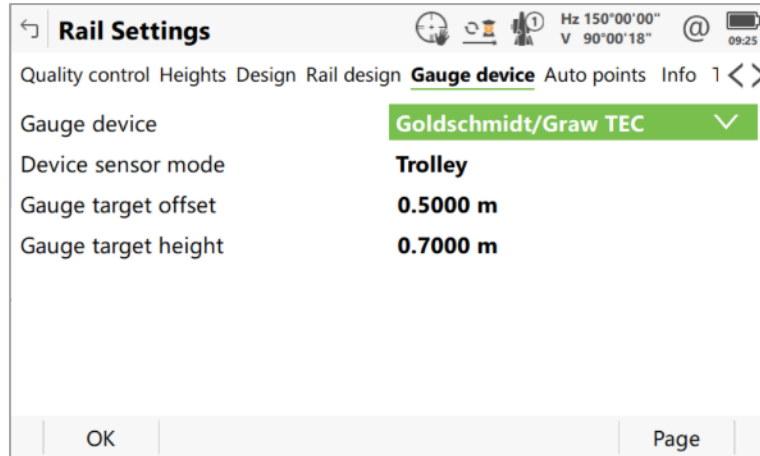
From Leica Captivate v8.50 onwards, an example of the data format, based on the configured import settings, is shown in the main import panel. This allows an easy way to check the current settings and proceed with import process.



**Stake/ Check rail –
New gauge device
supported**

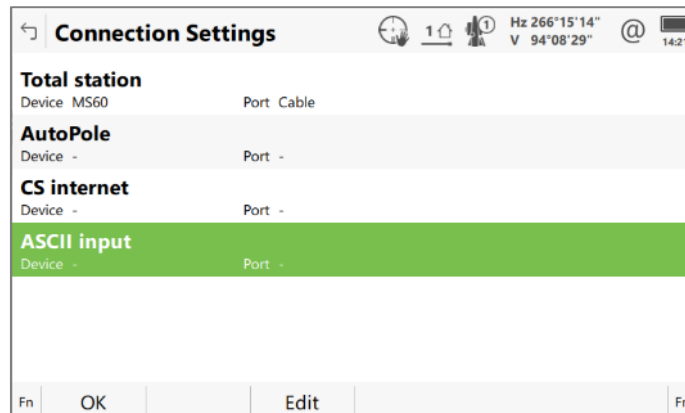


From Captivate version 8.50 onwards, a new gauge device from Goldschmidt/Graw will be supported in the **Stake/Check rail** app. The gauge device can be connected to using Bluetooth, and track-related measurement data received from the device.



**ASCII input –
Configuration of the
annotations in
Windows tablets**

Leica Captivate offers, within the Connection settings, an option to configure and connect an external device to receive and store some data. This option can be found under the **ASCII input** entry.



To follow the current serial interface standards to be able to still receive the information from the external device, Leica Captivate running in Windows tablets, needs to be configured by defining a format for the incoming messages.

^T.+

All sent message from the external device is compared to this definition and only the data matching it, is processed and populated in the configured annotation field.

ASCII Input

ASCII input **Annotation 1** Annotation 2 Annotation 3 Annotation 4

Store ASCII data to this annotation

Message desc a1

Message ID **^T.+**

Prefix '@<Desc>@' when writing

OK Page

In the above example, all messages starting with “T” are displayed in Annotation 1 field. The following are some real examples of received data:

Regular Expression	Example of Message
^D.+	D10.142
^T.+	T20.123

3 Leica Captivate New Features – GS specific

The new GS related features released with Leica Captivate v8.50 can be used with a Leica GS18, GS18 I and GS18 T using Leica Captivate v8.50 and with Leica Viva GS10, GS14, GS15, GS16 and GS25 sensor using SmartWorx Viva v12.50.

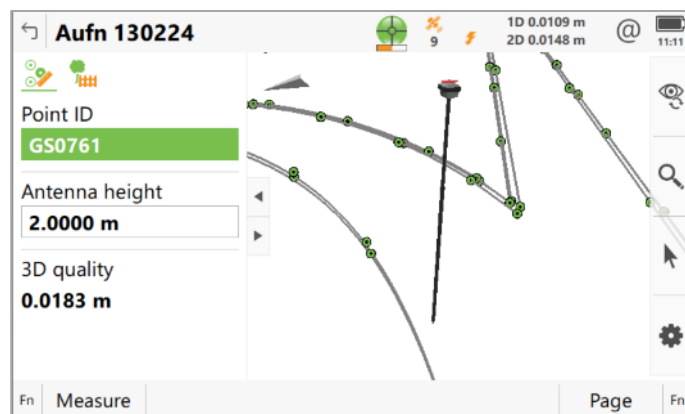
GS18 T/I – Tilt strength indicator bar



When measuring or staking with tilt-compensation using the Leica GS18 T or GS18 I, the sensor needs to be initialised through movements and accelerations of the pole. If this movement is stopped, the quality of the tilt compensation will gradually drop, until the initialisation is lost. In previous versions of Leica Captivate, there was no clear indication of the current tilt strength, and therefore no way to know if the initialisation was about to be lost.

With Captivate v8.50 a tilt strength indicator bar has been introduced, which graphically represents the current tilt initialisation strength, making the user aware of the current tilt quality. When the bar is low, it indicates a decreased tilt initialisation quality, which means further pole movements are required to increase the tilt quality and avoid losing initialisation.

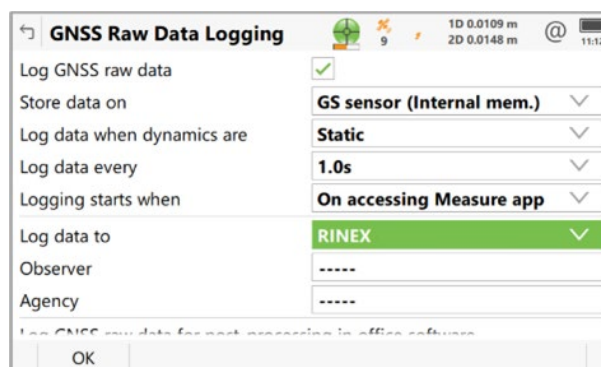
Making the user aware of the tilt initialisation strength ensures that tilt initialisation can be maintained and maximised, therefore improving productivity, user experience and measurement quality.



RINEX update

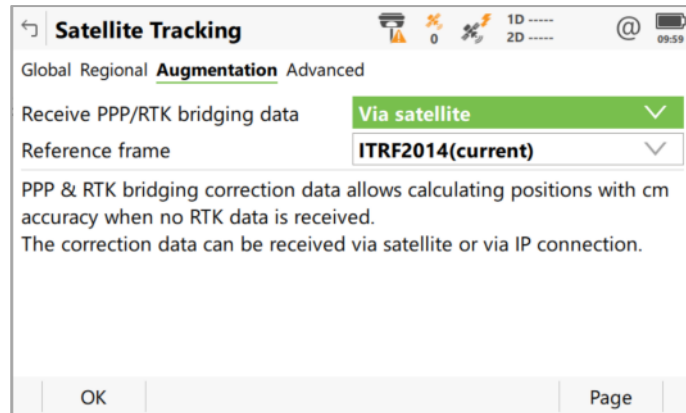
With Leica Captivate v8.50 RINEX support will be updated to offer modernized navigation message files. This is needed to be able to accommodate the new navigation messages from all the GNSS constellations, and system data messages such as ionospheric corrections, earth orientation parameters and system time offsets.

The new RINEX format is available in both Captivate v8.50 and GS Webserver.



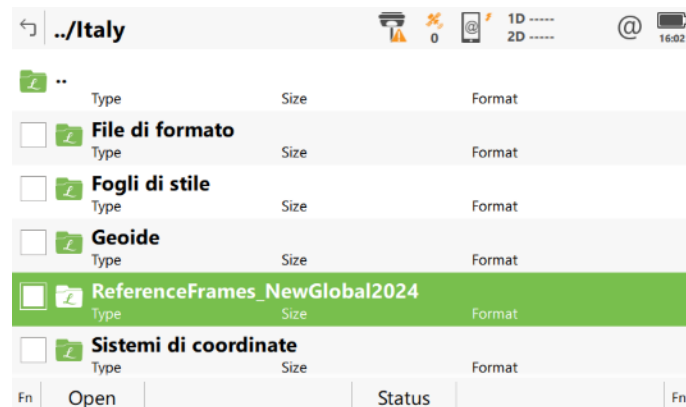
**Updated PPP
reference frame
database
REFRMSET.DAT**

With Leica Captivate v8.50 the PPP reference frame database, which includes the default PPP reference frame transformation parameters, has been updated. This database now includes some additional reference frames and the most recent publicly available parameters.

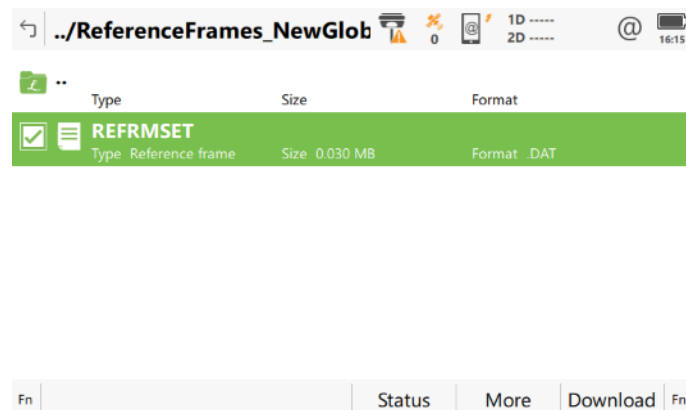


This new PPP reference frame database will be included by default in all new field controllers being delivered with Captivate v8.50.

For all other field controllers currently in the market, the new database can be downloaded directly using the new **Regional configurator** tool. The updated reference frame database is available in all listed countries within a sub-folder named: "ReferenceFrames_NewGlobal2024".



Tick the REFRMSET file and click download.

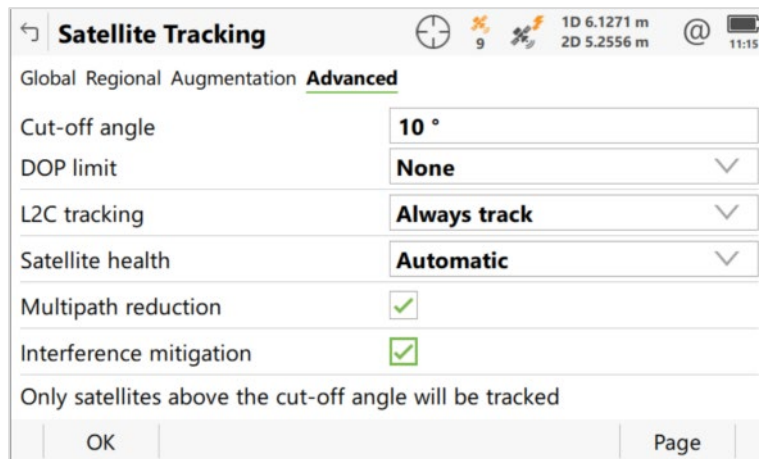


The file will be automatically downloaded and stored in the correct location in your device's internal memory, allowing direct use of the new PPP reference frame transformation parameters.

Multipath reduction option enabled by default

In Leica Captivate v6.50 the **Multipath reduction** option was introduced as an optional configuration. When this option is enabled, the quality of the GNSS signals gets improved especially when working in harsh environments improving the positioning performance.

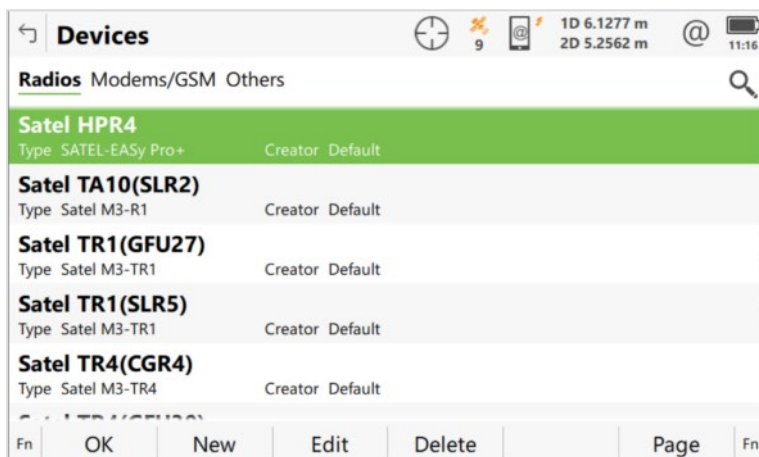
Since Leica Captivate v6.50, all market feedback and in field tests have shown the benefits of using the **Multipath reduction** in all conditions. Therefore, with Leica Captivate v8.50 the **Multipath reduction** option will be set as enabled by default. This automatic configuration will happen only once, allowing the user to set back this option to their preferred status. Future Leica Captivate FW updates won't overwrite the **Multipath reduction** option if it has been already done with Leica Captivate v8.50.



Support of Satel HPR4 radio profile

With Leica Captivate v8.50 a new radio profile supporting the HPR4 high power radio has been introduced. This new profile supports all power, channel spacing and radio protocols options supported by HPR4.

If HPR4 options does not appear by default, please go to **Fn** and then **Default**. The list will be updated and HPR4 profile will appear.



**Updated
Measurement Engine
firmware to v7.901**

With Leica Captivate v8.50 the Measurement Engine firmware has been updated to version 7.901.

With this version the Precise Point Positioning (PPP) performance is improved in environments affected by ionospheric scintillation to enhance availability and accuracy. When compared to previous firmware versions, this firmware demonstrated up to 60% PPP horizontal accuracy improvements during peak scintillation events. Note that performance varies and is subject to the local environment and the duration and magnitude of scintillation.

A vital part of these improvements lies in the combination of multi-constellation and multi-frequency configuration in GNSS receivers and HxGN SmartNet Global corrections.

This new firmware version will be automatically installed in all GS10, GS16, GS25 and GS18 with OEM7 boards. For GS07, a manual update via Captivate will be needed.

4 Leica Captivate Software Improvements

AP20 workflow – Entering an offset interrupts the tilt initialisation

When working with the AP20 in the Measure app, if an offset greater than 0.2 meters was entered, the current active tilt initialisation was interrupted and a re-initialisation was needed.

This issue is fixed in Leica Captivate v8.50.

Stake to line – Changing to a different design job crashes Captivate

In previous Leica Captivate versions, if the design job was changed while using either the Quick line or Quick arc methods, Stake to line app crashed.

This issue is fixed in Leica Captivate v8.50.

Annotations - Last button not available for GNSS measurements

When working in GS mode and measuring points by using annotations, the “Last” button to automatically use the previously entered value, was not shown.

This issue is fixed in Leica Captivate v8.50.

WMS – Simultaneous usage of Coordinate system and Geoid slows down Captivate

Previous Leica Captivate versions offer a slow response when showing the WMS images if a specific coordinate systems and geoids were used at the same time.

This issue is fixed in Leica Captivate v8.50.

Setup on the fly – Geometries disappear and Leica Captivate freezes

When an open setup was finished, if the job contained some of the new linework released in previous Leica Captivate versions (2 or 3 point circle or 3 point rectangle), the geometries were lost and Leica Captivate froze once the setup calculation was done.

This issue is fixed in Leica Captivate v8.50.

GeoCloud Drive – Wrong job size displayed

Leica Captivate previous versions wrongly showed the job size in the upload workflows if the jobs contain scans, images or reference files.

This issue is fixed in Leica Captivate v8.50.

Sorting the Mountpoint list by distance freezes Leica Captivate

When sorting a Mountpoint list by the distance criteria, if the distance to the mountpoint is not known (the controller is not connected to the GS sensor and therefore, does not have a known position), Leica Captivate freezes.

This issue is fixed in Leica Captivate v8.50.

Check tunnel – Leica Captivate freezes when checking the profile by scanning

In previous Leica Captivate versions if the setup was outside of the tunnel section, Leica Captivate froze when entering Check tunnel app and the Profile by scanning method was selected.

This issue is fixed in Leica Captivate v8.50.

Setup - Resection calculation does use the right triplet but the job export shows a different a wrong one

When a resection was done in the Setup app, if any of the used control points had multiple measurement triplets (was averaged), the calculated solution used the right triplet but Leica Captivate wrongly stored in the database the information of the used triplet and showing the incorrect information in the HeXML export too.

This issue is fixed in Leica Captivate v8.50.

Stake DTM – Leica Captivate freeze when changing the target type within the app

When the target type was changed with the Stake DTM or Stake pts & DTM apps, Leica Captivate might start lagging, stakeout values were not updated at some point and the software might even freeze.

This issue is fixed in Leica Captivate v8.50.

Issues when reading distances continuously with extremely low battery

In previous Leica Captivate versions running on recently produced Leica Viva TS16 and Leica TS13 total stations, issues may be observed when reading distances continuously with an extremely low battery state. This is due to slightly different behaviour of newly implemented electronic components caused by mandatory end of life changes.

In Leica Captivate v8.50 the affected total stations will stop reading distances when **Measure distance** is set to **Continuously** and the battery level is extremely low.

5 Obtaining and loading the new software using the online update (CS Field Controller and TS/MS Total Stations)

It is strongly recommended to use the online update to load the new software to the CS Field Controller and TS/MS Total Stations. As a pre-requisite, your instrument must be registered in Leica myWorld.



The online update cannot be used to load the new software to the GS18 GNSS receivers.

Once your Controller or Total Station has been registered in myWorld, connect your instrument to the internet. It is recommended to use a WLAN connection.

Open Leica Captivate on the device and navigate to the **Settings – Tools – Update Software** panel. The field **Update software using** contains the option **Online update**. Note that this option is only available if a new version is available online. The instrument will do a check for new versions within the first minutes of being connected to the internet. An SD card needs to be inserted in the instrument for the firmware update to work.

When selecting this option and pressing **F1(OK)**, the firmware update is triggered. Should the currently installed CCP license not be valid for the firmware to be installed, a check for new licenses is done first. If any new licenses, such as extended CCPs, are available in Leica myWorld, those new licenses will be downloaded and installed first.

Afterwards, the new firmware file and all additionally loaded apps will be downloaded and once successfully finished, the installation process is started automatically.

6 Obtaining and loading the new software using manual loading (CS20 Field Controller, TS/MS instruments and AP20 AutoPole)

If you prefer not to use the myWorld online update, it is also possible to “manually” load the new software – in this case, please carefully read the notes below.

Obtaining the new software

The new software, language files and apps can be obtained from the following sources:

- the myWorld web site
- your local Leica Selling Unit or Dealer

Files which need to be obtained for upgrading a CS20 Field Controller

The following file needs to be obtained to update a CS20 Field Controller - CS20LeicaCaptive_v8_50.fw

This file contains all Leica Captivate and WinCE languages and apps

Files which need to be obtained for upgrading a TS/MS instrument

**The following file needs to be obtained to update a TS/MS instrument - TSxxMS60LeicaCaptive_v8_50.fw
TS10LeicaCaptive_v8_50.fw**

These files contain all Leica Captivate and WinCE languages and apps

Files which need to be obtained for upgrading an AP20 AutoPole

The following files need to be obtained to update an AP20 AutoPole -
AP20H_ID_Firmware.swu - for AP20 H and AP20 ID
AP20_T_Firmware.swu - for AP20 T and AP20

Note that for the Captivate v8.50 release, there are no firmware updates for the AP20.

How to load the Leica Captivate files to a CS20 Field Controller or TS/MS instrument

1. Insert your SD card or USB flash drive into your PC or card reader and copy the necessary file to be uploaded to the instrument to the **System** directory of the used memory device. This can be done with Windows Explorer or any other suitable PC software.
2. Insert the SD card or USB flash drive into the CS20 Field Controller or TS/MS instrument and turn on. Ensure the battery is fully charged.
3. From the main menu, choose **Settings** and then choose menu item **Tools** and then choose **Update software**. The **Update software** screen is now visible.
4. In the **File to load** list box ensure the correct file name is visible. If the file name is not visible, then check you have correctly copied the firmware file to the **System** directory of the SD card USB flash drive.
5. Press **F1(OK)** – a message will appear to remind you that the CS20 Controller or TS Total Station will turn off and on during the process. Press **F6(Yes)** to begin the loading process.
6. The loading process will take a few minutes and the CS20 Controller or TS Total Station will turn off and on several times during the process.

How to load the Firmware on an AP20 AutoPole

1. Download the suitable firmware file from <https://myworld.leica-geosystems.com> to your local PC.
2. Turn on the AP20.
3. Connect the AP20 to the PC using a GEV284 cable.
4. Copy the firmware file onto the root directory of the AP20 memory device.
5. Disconnect GEV284 cable from the AP20.
6. Switch the AP20 off.
7. Switch the AP20 on.
8. The upload starts automatically. During the upload, all three LEDs are flashing consecutively.
9. The update is complete when the Power LED on AP20 is constantly on.

How to load the Leica Captivate files to a TS13 Total Station with a 4-button keyboard

1. Insert your SD card into your PC or card reader and copy the necessary file to be uploaded to the instrument to the System directory of the Sd card. This can be done with Windows Explorer or any other suitable PC software.
2. Insert the SD card into the TS13 Total Station.
3. Ensure the battery is fully charged.
4. Turn on the instrument, the firmware update starts automatically.
5. Check the power LED. If it shows permanent green, the firmware update is finished.

7 Obtaining and loading the new software using manual loading (GS18, GS18 T and I GNSS sensors)

The GS18, GS18 T and I GNSS sensors can only be updated manually. Follow the instructions below.

Obtaining the new software

The new software, language files and apps can be obtained from the following sources:

- the myWorld web site (it is also possible to manually download the files from the myWorld web site as well as automatically upgrading your controllers and sensors with myWorld)
- your local Leica Selling Unit or Dealer

Files which need to be obtained for upgrading a GS18, GS18 T and I GNSS sensor

The following file must be downloaded to update the GS18, GS18 T and I GNSS sensors:

GSxxLeicaCaptive_v8_50.fw

How to load the Leica Captivate files to the GS18, GS18 T and I GNSS sensors

1. Insert the SD card into your PC or card reader and copy the firmware file to be uploaded to the instrument to the **System** directory of the card. This can be done with Windows Explorer or any other suitable PC software. (it is NOT possible to use a USB stick to update your GS18 T or GS18 I GNSS sensor)
Or
Download the firmware file to the PC from which you will update the GS18 T or I GNSS sensor
2. Insert the SD card into the GS18 T or GS18 I GNSS sensor. Ensure the battery is fully charged.
3. Connect the GS18 T or GS18 I GNSS sensor to your PC via a USB cable. Open the web interface by typing **192.168.254.2** into the browser window.
4. Go to **User – Load firmware** to start the firmware update. You can now either browse to the firmware file on your PC or check the box that says the firmware file is on the SD card.
5. Start the firmware update and follow the instructions in the web interface.

8 Obtaining and loading the new software using manual loading (CS3x and CC200 Tablets)

The CS3x and CC200 Tablets can also be updated manually. Follow the instructions below.

Obtaining the new software

The new software, language files and apps can be obtained from the following sources:

- the myWorld web site (it is also possible to manually download the files from the myWorld web site as well as automatically upgrading your controllers and sensors with myWorld)
- your local Leica Selling Unit or Dealer

Files which need to be obtained for upgrading a CS3x/CC200 Tablets

The following file must be downloaded to update the CS3x, CC200 and the third-party Windows Tablets.

LeicaCaptive_CS3x-CC200_v8.50.zip

The file contains Leica Captivate languages and apps.

How to load the Leica Captivate files to the CS3x/CC200 Tablet

1. If the tablet already has Leica Captivate installed with a version prior to v8.00, it will first need to be uninstalled manually within Windows. This can be done by going to **Apps & features**, finding the Leica Captivate application and then selecting **Uninstall**
2. Extract the downloaded .zip file and run the **Setup_x64.exe** file on the tablet
3. Follow the installation wizard instructions

Note that when first upgrading Leica Captivate from a version prior to v8.00, all existing jobs, data files and setting files that existed in the “Leica Captivate” folder will be automatically copied into a new folder called “Leica Captivate_x64”. The folder location can be modified during the installation, by changing the Loadable Application path.

Obtaining sample data

Leica Geosystems provides sample data that can be used with the simulator or the instruments to help you explore the features and apps of Leica Captivate. The sample data needs to be installed using a separate installer. Before using it on a CS20 Controller or a TS Total Station, the data needs to be installed on a simulator first.

During the installation, it is possible to select for which simulators the sample data can be installed (SmartWorx Viva CS simulator, SmartWorx Viva TS simulator, Leica Captivate TS/MS simulator, Leica Captivate CS simulator and Leica Captivate CS x64 simulator).

The sample data installer can be downloaded from myWorld. An installation guide is provided along with the sample data installer, though the installation process is very easy to follow.