



Stonex Cube-a
Field Software
Release Note v.6.3.12



Content

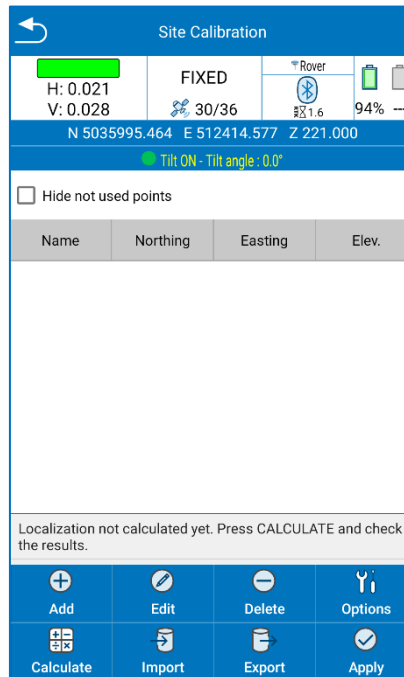
- Content 2
- 1. GNSS Module 3
 - 1.1. Site Calibration - *Improvements* 3
 - 1.2. Radio Mode - *Improvements* 4
 - 1.3. Height Stakeout - *Improvements* 5
- 2. TS Module 6
 - 2.1. TS Stakeout Methods - *Improvements* 6
 - 2.1.1. Stakeout by Polar + fwd/bck..... 8
 - 2.1.2. Stakeout by Directions (1-man)..... 9
 - 2.1.3. Stakeout by Directions (2-man)..... 10
 - 2.2. Station on Point Improvement - *TS Scale Factor* 11
 - 2.3. Resection/Free Station Improvement - *TS Scale Factor* 13
 - 2.4. Line Stakeout - *Measure directly with TS*..... 15
 - 2.5. TS Module - *Other Improvements* 16
- 3. General Improvements..... 17
 - 3.1. Fieldbook Improvements 17
 - 3.1.1. GNSS Fieldbook..... 18
 - 3.1.2. TS Fieldbook..... 19
 - 3.2. CAD - Bearing 20
 - 3.3. Plane Stakeout 21
 - 3.4. Other Improvements..... 22
- 4. Bug Fixed 23

1. GNSS Module

1.1. Site Calibration - Improvements



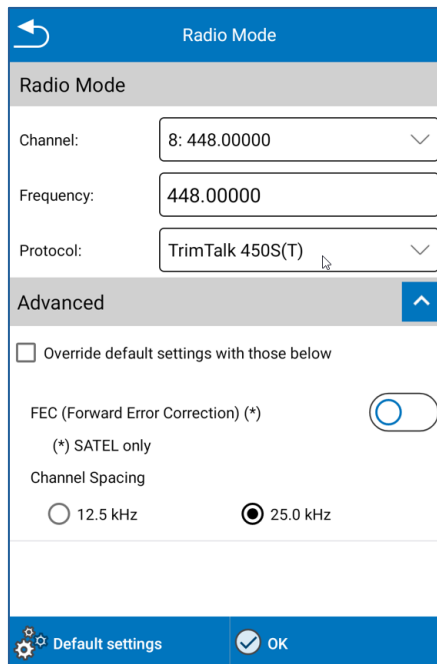
The GPS Top Bar is also visible on the Site Localization page. This new feature is intended to make it easier to carry out "site calibration" by displaying the relevant information at the top of the page.



The user can see the related GNSS information which can be useful while performing site calibration operation from the *Calibrate Page* -> *Site Calibration*.

1.2. Radio Mode – Improvements

Radio Mode Add advanced settings for the internal radio configuration.



The screenshot displays the 'Radio Mode' configuration interface. It features a blue header with a back arrow and the title 'Radio Mode'. Below the header, there are three input fields: 'Channel' with the value '8: 448.00000', 'Frequency' with '448.00000', and 'Protocol' with 'TrimTalk 450S(T)'. A section titled 'Advanced' is expanded, showing a checkbox for 'Override default settings with those below' which is unchecked. Below this, there is a toggle switch for 'FEC (Forward Error Correction) (*)' which is currently turned off. A note '(*) SATEL only' is displayed below the toggle. Underneath, the 'Channel Spacing' is set to '25.0 kHz' via radio buttons, with '12.5 kHz' also available. At the bottom, there are two buttons: 'Default settings' with a gear icon and 'OK' with a checkmark icon.

The user can now select the channel spacing and enable or disable the FEC for the Satel protocols in *Device -> Working Mode -> Rover or Base -> Internal Radio -> Advanced*.

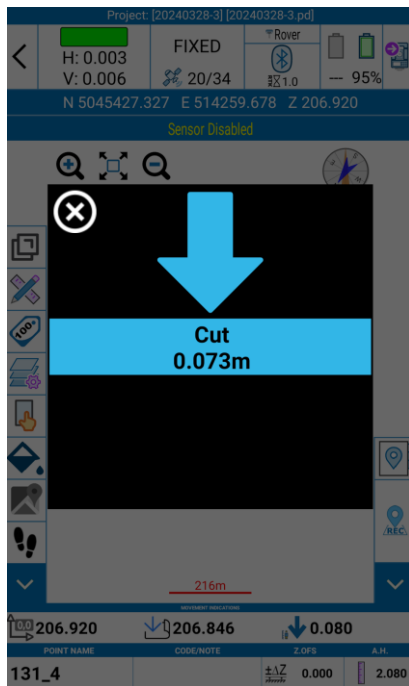
1.3. Height Stakeout – Improvements



Height Stakeout

Improvement in Height Stakeout function to read GNSS Status also in cut/fill box.

In Height Stakeout function, the values are not displayed in cut/fill box, if the GNSS receiver is not in FIXED status. In this condition the sentence “Not Fixed” is displayed to alert the user.



FIXED Solution



NOT FIXED Solution

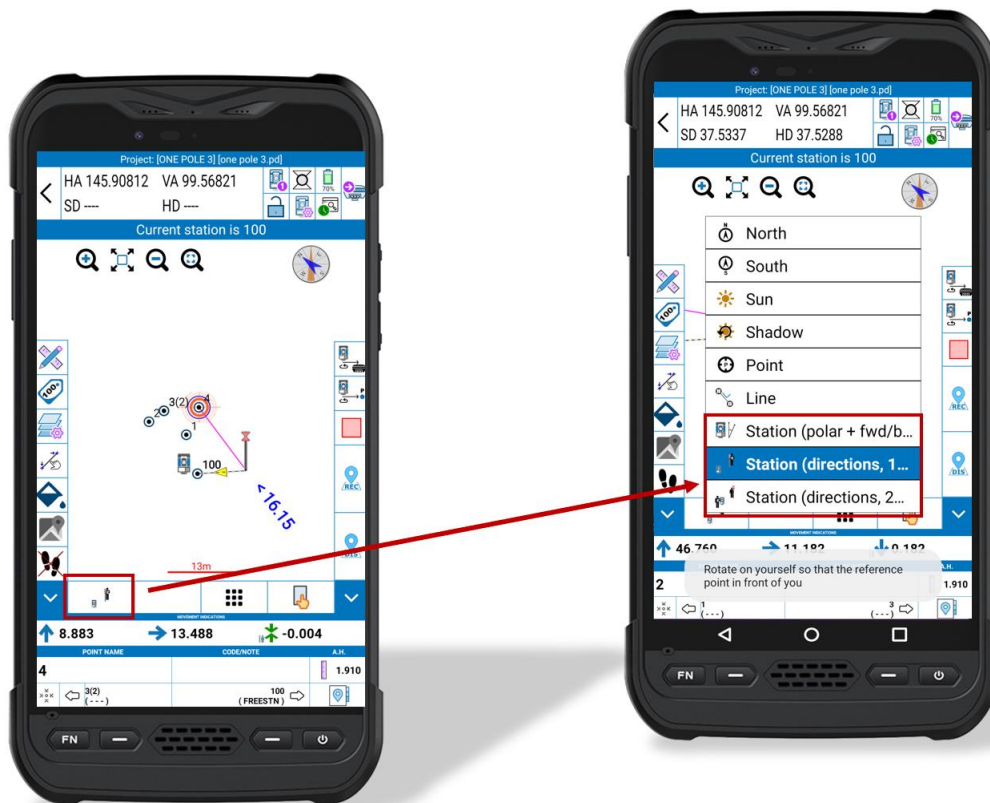
2.TS Module

2.1. TS Stakeout Methods - Improvements



Point Stakeout

Stakeout with Total Station was improved and made easier with the definition of three stakeout methods: *Stakeout by Polar + fwd/bck*, *Stakeout by Directions (1-man)* and *Stakeout by Directions (2-man)*



The user can choose the stakeout methods to use respect his needs and the survey condition. Clicking on the icon highlighted in the image above it's possible to change the stakeout methods switching from one to another in any moments of the survey.

There are three different methods to use for stakeout points using a TS.
Here below their description:



*Stakeout by Polar
+ fwd/bck*

Stakeout point using angles and distance as stakeout indications.



*Stakeout by Directions
(1-man)*

Stakeout point using arrows directions given from user to the station. Choose this option if you are alone in the field. This mode has to be used when working with a motorized/robotic station.



*Stakeout by Directions
(2-man)*

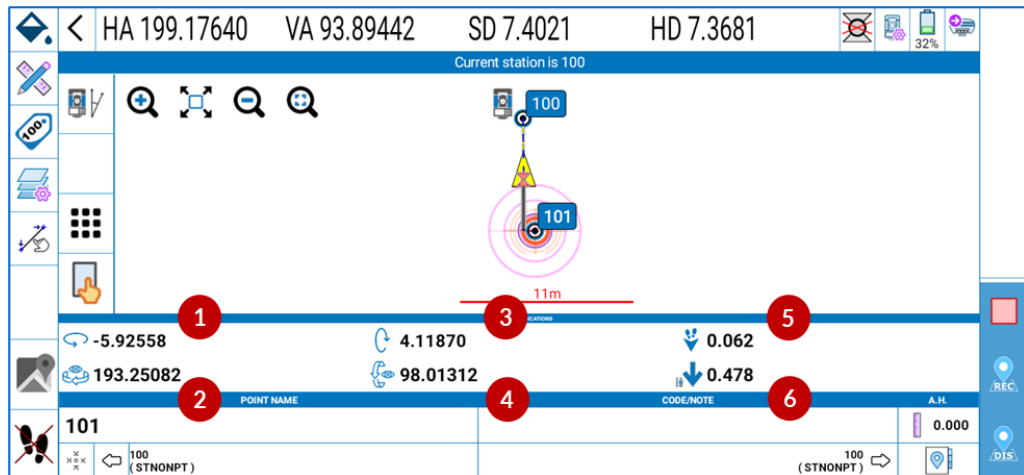
Stakeout point using arrows directions given from station to the user. Choose this option if there are two people at least in the field. One stays at the total station and gives instructions to the second one who is close to prism.

Note. In "Height Stakeout" the polar stakeout cannot be used: there is not a target point, but the user can move freely around. The app will show the cut/fill of the current position. There is no change in the working mode for Height Stakeout.

2.1.1. Stakeout by Polar + fwd/bck



Select *Stakeout by Polar + fwd/bck* to stakeout point using angles and distance indications.

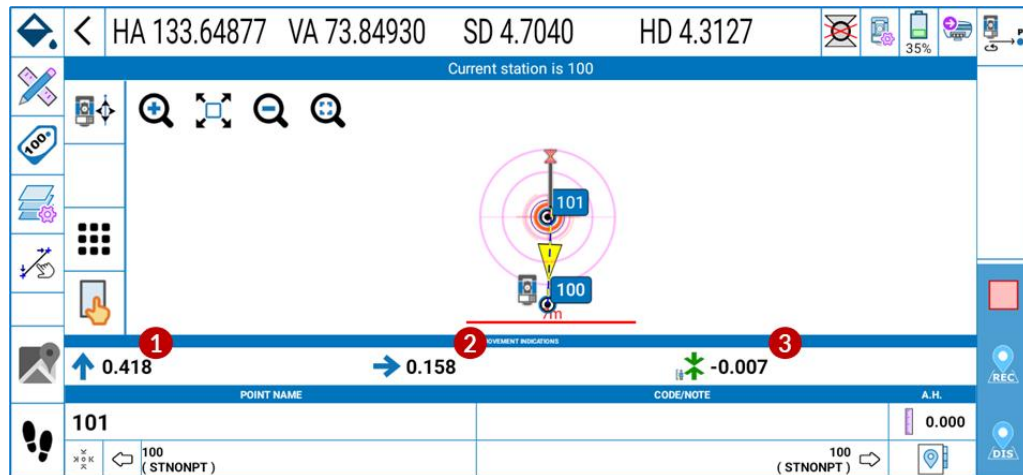


- 1 *HA Offset*. When HA offset is $0^{\circ}00'00''$, the stakeout direction is correct.
- 2 *HA stakeout angle*. HA Angle corresponding to the stakeout direction.
- 3 *VA Offset*. When VA offset is $0^{\circ}00'00''$, the stakeout direction is correct.
- 4 *VA stakeout angle*. VA Angle corresponding to the stakeout direction.
- 5 *Longitude distance*. Move back (▼) or forwards (▲) from the station. It becomes green when reaching the stake out point.
- 6 *Stakeout point elevation*. Move the pole up and down, it becomes green when reaching the stake out point.

2.1.2. Stakeout by Directions (1-man)



Select *Stakeout by Directions (1-man)* to stakeout point using arrows directions (from user to station).



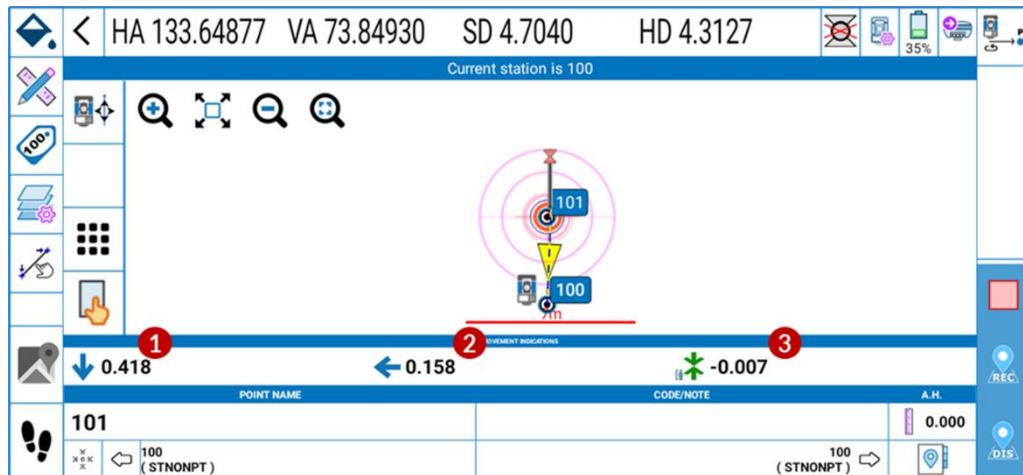
- 1 Move the pole back or forward from the station.
- 2 Move the pole left or right respect the station.
- 3 Move the pole up and down.

Note. When selecting Stakeout by Directions, the message «Rotate on yourself so that the reference point in front of you» appears. This is to inform the user to rotate himself and look the station, taking the total station position as reference for stakeout operation.

2.1.3. Stakeout by Directions (2-man)



Select *Stakeout by Directions (2-man)* to stakeout point using arrows directions (from station to user).



- 1 Move the pole back or forward from the station.
- 2 Move the pole left or right respect the station.
- 3 Move the pole up and down.

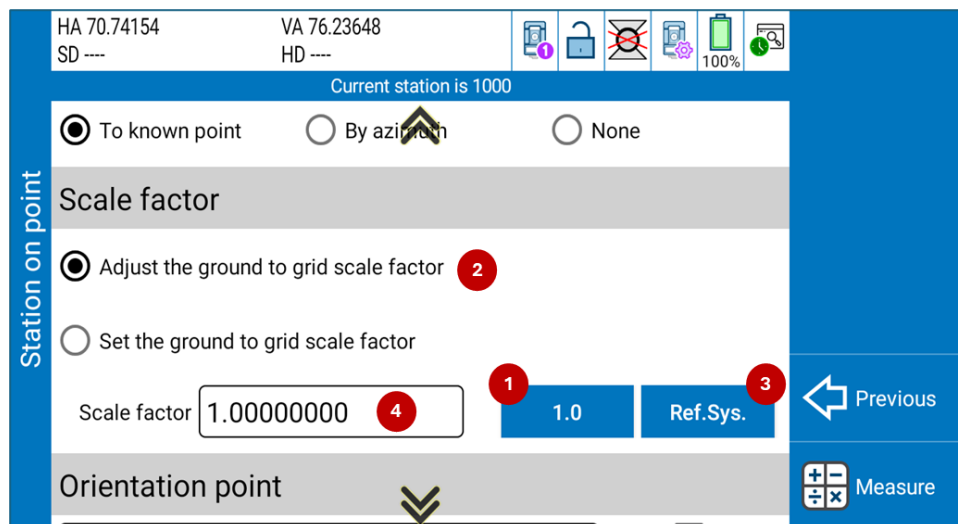
2.2. Station on Point Improvement – TS Scale Factor



Station on point

The *Scale Factor* section in Station on Point function was improved adding the possibility to customize TS scale factor respects user needs.

After defining station position, the orientation page appears. In this page the user has to define the station orientation.



- 1 Set the scale factor equal to 1 to work in a local reference system with real distances (Cube-a sets it equal to 1 by default).
- 2 Flag this option to calculate the TS scale factor using scaled data (like GNSS data for example). Enable this option to be able to compare TS measurements with scaled data. (Note. This option is available only by selecting “To Known Point” as Orientation Mode)
- 3 Use this option to set the TS scale factor equal to the one of the project reference system. Enable this option to be able to compare TS measurements with scaled data.
- 4 Use this option to set the TS scale factor manually. Enable this option to be able to compare TS measurements with scaled data.

The choice between option 2,3,4 depends on user needs and data.

After setting the TS Scale Factor parameter, continue station orientation procedure, following the video tutorial below.



VIDEO TUTORIAL

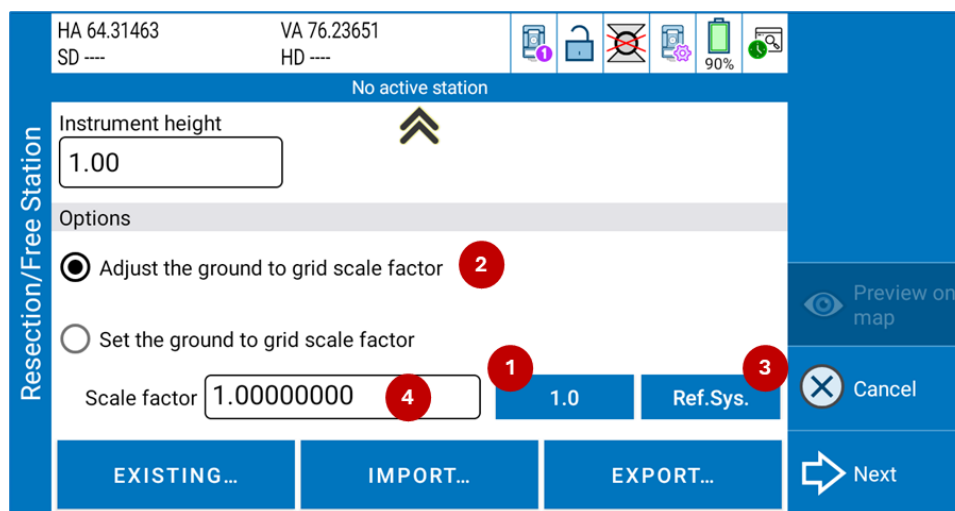
[Station On Point Video Tutorial](#)

2.3. Resection/Free Station Improvement – TS Scale Factor



The *Options* section in Resection/Free Station function was improved adding the possibility to customize TS scale factor respects user needs.

When entering in Free Station/Resection function, the software asks for the definition of the TS scale factor.



- 1 Set the scale factor equal to 1 if you are using real-distances data for free station calculation.
- 2 Flag this option to calculate the TS scale factor when using scaled data (like GNSS data for example) for free station calculation. Enable this option to be able to compare TS measurements with scaled data.
- 3 Use this option to set the TS scale factor equal to the one of the project reference system, when using scaled data (like GNSS data for example) for free station calculation. Enable this option to be able to compare TS measurements with scaled data.
- 4 Use this option to set the TS scale factor manually, when using scaled data (like GNSS data for example) for free station calculation. Enable this option to be able to compare TS measurements with scaled data.

The choice between option 2,3,4 depends on user needs and data.

After setting the TS Scale Factor parameter, continue free station procedure, following video tutorial below.



VIDEO TUTORIAL

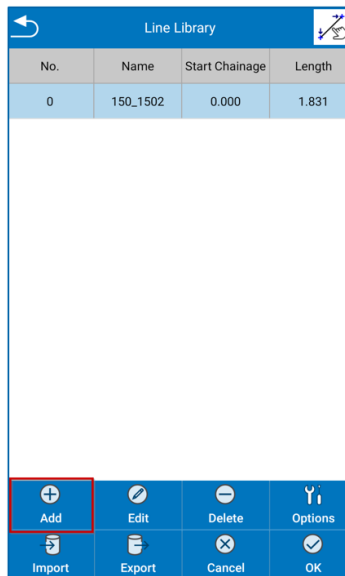
[Resection/Free station Video Tutorial](#)

2.4. Line Stakeout - Measure directly with TS

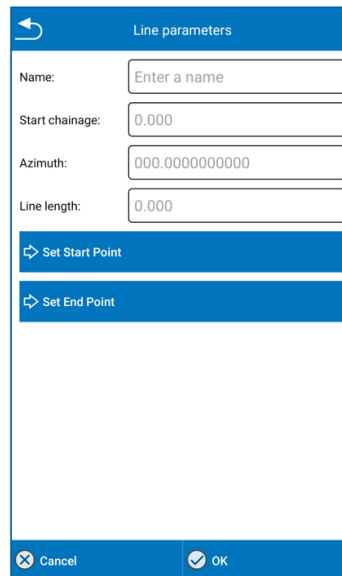


Line Stakeout

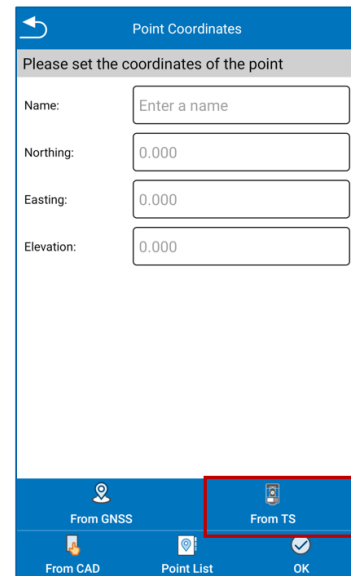
Line Stakeout function was improved giving the possibility to measure the Starting and Ending point of the new line also with TS.



Add new Line



Set Start and End Point measuring directly from the TS



Enter in stakeout line function. Now it's possible to add a new line to stakeout, measuring it directly with Total Station.

2.5. TS Module - Other Improvements

- *TS Module.* SD measurement is cleared from cube-a upper bar, if the prism type, the pole type, the EDM mode changes. This option was added to avoid registration of possible wrong data.
- *TS Module.* SD measurement is cleared from cube-a upper bar, after the point resume page is closed (in any case if the point is stored or not). This happens also in TS quick mode, after recording the point. This option was added to avoid registration of possible wrong data.
- *TS Module.* Pressing and holding the DIS or REC buttons in the survey page, it's possible to measure only angle and store a point without distance, clicking on "Measure HA" and then on REC. The coordinates displayed for these points are calculated using a fictitious distance. If you are measuring only angles, the coordinates stored should not be consider correct.

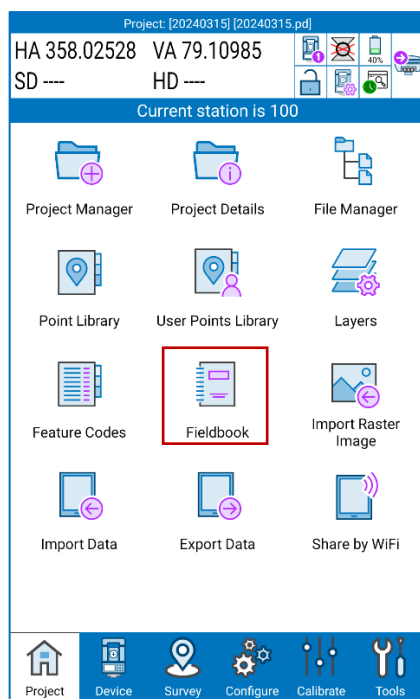
3. General Improvements

3.1. Fieldbook Improvements



Fieldbook

Fieldbook function was improved making it easier to use and adding the complete Fieldbook re-calculation, if the user changes some data.



From Cube-a *Project* section, the user can access to the survey **Fieldbook**, on which he can read all the GNSS and TS survey data.

The new Cube-a Fieldbook is completely editable, and it's automatically re-calculated after every modification made.

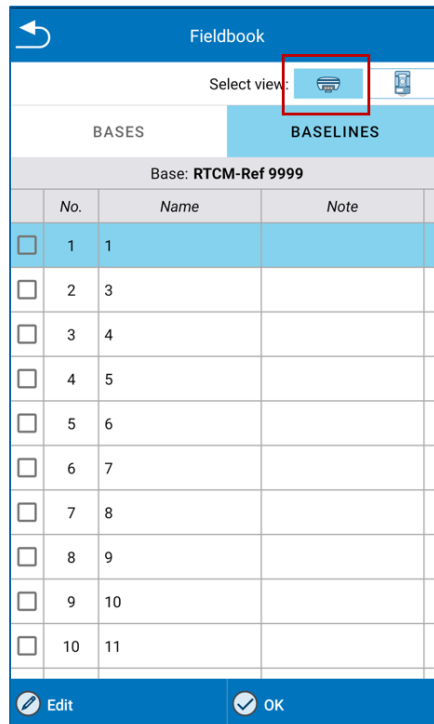
The Fieldbook is divided in two sections:

1. *GNSS Fieldbook* – contains all the information about the GNSS base and the baselines related to the collected points.
2. *TS Fieldbook* – contains all the information about TS station position and the raw data associated to each measurement.

3.1.1. GNSS Fieldbook



Clicking on the GNSS Receiver icon, the user can enter in GNSS Fieldbook section.



Horizontal Scroll

BASES

In *Bases* section, the user can read the GNSS reference bases information. Clicking on *Edit*, it's possible to change the GNSS reference base coordinates entering directly in "Change Station Coordinate" function. After changing the reference base coordinate, the Fieldbook is recalculated.

BASELINES

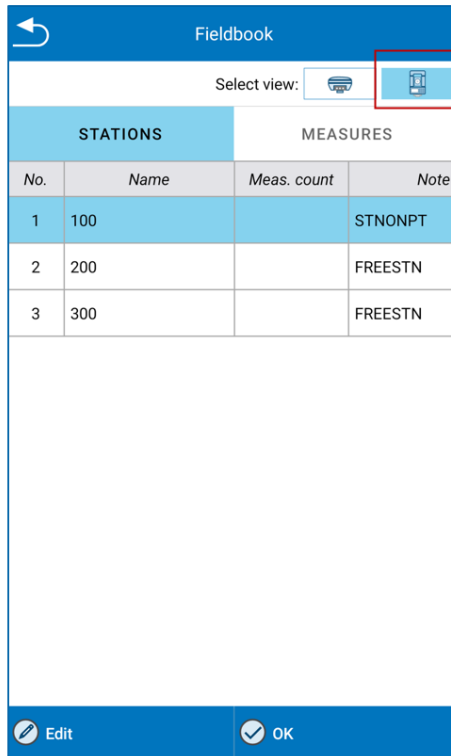
In *Baselines* section, the user can read the information about the GNSS points collected. Clicking on *Edit* it's possible to modify the GNSS points collected. Scroll in vertical direction to read all the data associated to a GNSS points and click on *OK* to confirm the changings. After pressing *OK* the Fieldbook is recalculated.

In *Baselines* section, it's possible to modify the Name and the Pole Height of more than one point simultaneously. Click on the squares in the first column to select the points to modify.

3.1.2. TS Fieldbook



Clicking on the TS icon, the user can enter in TS Fieldbook section.



Horizontal Scroll

STATIONS

In *Stations* section, the user can read the TS station position information. Clicking on *Edit* it's possible to change the station coordinates, the instrument height and the TS Scale Factor associated to that station. After changing them, the Fieldbook is recalculated.

MEASURES

In *Measures* section, the user can read the information about the TS points collected. Clicking on *Edit* it's possible to modify the TS measurements. Scroll in vertical direction to read all the data associated to a TS point and click on *OK* to confirm the changings. After pressing *OK* the Fieldbook is recalculated.

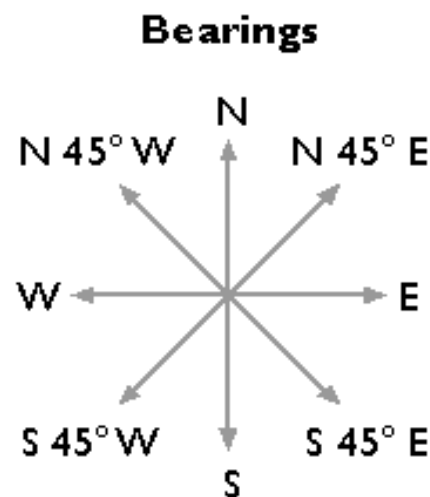
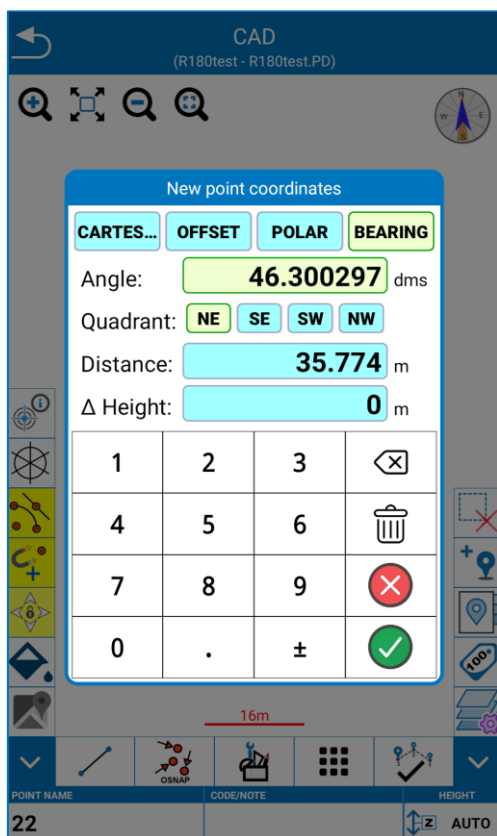
In *Measures* section, it's possible to modify the Name, the Prism Type, the Pole Type and Pole Height of more than one point simultaneously. Click on the squares in the first column to select the points to modify.

NOTE. When changing the free station calculation, clicking on *Edit* the 'Free Station' page in Calibrate menu is displayed.

3.2. CAD - Bearing

BEARING

In the CAD area while drawing a new entity, it is possible to define the next points entering angles relative to a direction. The angles are expressed as a deviation from that direction giving a delta angle and an East or West side of the selected direction.



When creating a new entity in CAD environment, it is possible to define the next points choosing between different methods:

- *Cartesian*: for defining it manually inserting Cartesian Coordinates.
- *Offset*: for defining it inserting X, Y, Z offset respect the previous point.
- *Polar*: for defining it inserting angle, distance and Δ Height respect the previous point.
- *Bearing*: for defining it entering the angles relative to a direction. The angles are expressed as a deviation from that direction giving a delta angle and East and West side of the selected direction.

3.3. Plane Stakeout



Height Stakeout

It is possible to receive audible tones while staking out a plane and when we are inside the limits.



When the user carries out a height stakeout, if the parameters are respected, the user will receive the audible tones from Cube-a. The level of the beep can be adjusted using the buttons on the controller. To reach the relative page Survey -> Height Stakeout.

3.4. Other Improvements

- *General.* Display memory for External Drawings and TIN Entities modified to prevent to get the error message “Out of memory”.
- *General.* New geoid for Lithuania (LIT20G updated)
- *General.* Ireland/Malin - geoid file rebuilt.
- *General.* New reference system and geoid for Canada.
- *General.* Norwegian Language translation added.
- *General.* New geoid for Finland.
- *General.* Improvement in French translation.
- *General.* OSNAP setup: manage all Measure Units.

4. Bug Fixed

- *TS Module.* Solved Cube-a random crash when defining the station position and its orientation using station on point/free station function.
- *TS Module.* Compass in the survey page removed from cube-a onboard version (TS).
- *TS Module.* When using Cube-a with R180 in robotic configuration, solved the bug of the automatic prediction mode disabling on the tablet.
- *TS Module.* When using Cube-a with R180 in robotic configuration, solved the de-synchronization of the prediction settings, between tablet and Cube-a onboard.
- *TS Module.* Restored the correct link from survey page to calibrate section when the user has to define the station position.
- *TS Module.* Solved issue of prism constant when changing from prism to no prism.
- *TS Module.* In free station function, the warning message has been restored if the user does not enter the instrument height value.
- *TS Module.* Solved the bug when transferring data with BT between R60 and the tablet.
- *General.* Point filter problem in the page Display Settings has been solved.
- *General.* Fix text of polyline edge lengths uses the same line-style of the polyline.
- *General.* Fix external drawing could still show in the graphics even if they are set invisible.
- *General.* Fix conversion issue when using background maps with MGI34-GIS Grid.

- *General.* Italy allow use of GR1/GR2 grids to compute orthometric heights even if using ETRF frame.
- *General.* Fixes to RTCM v3 decoder (1021 and 2023 messages).
- *General.* Fixes in CAD Function: Area Divide.
- *General.* Fixed problem: custom values added to lookup lists were mapped to the first list value when re-editing the GIS data.
- *General.* Fixed problem: visualisation of the DXF files which have been imported as external drawing.
- *GNSS Module.* Fixed GPS pole height change the Point Library in case of IMU used during the survey.
- *GNSS Module.* Fixes to prevent IMU animations showing where not needed.
- *GNSS Module.* Fix list of countries not opening (Android OS problem) in the definition of a new NTRIP caster and in the definition of a new APN for Internal Network.
- *GNSS Module.* Fixes in GPS Site Calibration function.